Chapter 4 Environmental Condition in and around Ghana Sea Ports

The existing environmental conditions in and around Takoradi and Tema port areas were studied through literature, statistics, interviews, field reconnaissance and field surveys. Since detailed data and information is introduced in the draft EIS (in Appendices), this chapter summarizes the environmental features of two (2) ports.

4.1 Takoradi Port

4.1.1 Water Quality

A field survey was carried out in the time zone of the low water on 25th January 2001 to know the worst water quality condition. The surface water sampling was done at four (4) locations in and around the port basin. The water quality showed the moderately polluted condition in general, and no significant difference between the locations (see Appendix A).

Since Ghana has not established an ambient water quality standards, a series of quality reference value for selected parameters were introduced (see Appendix A) as an Assumed Environmental Criteria (AEC). This was tentatively set up based on the examples of criteria for port waters in tropical and subtropical eight (8) countries to help understand the water quality situation objectively.

Comparing with AEC, it should be noted that oil and grease concentration revealed high value exceeding the criteria for ordinary sea ports, though other parameters showed concentrations that meet the AEC. Management of oil spill and leakage should take the first priority for water quality management in Takoradi Port.

4.1.2 Bottom Sediment Quality

A field survey on the bottom sediment quality was conducted at the same time as the water quality survey. The bottom sediment quality at four (4) locations revealed the heavily polluted condition in the entire survey area. Particularly, the innermost part of the port showed the most severe pollution both in organic matters indicated with COD, and the heavy metal (see Appendix A).

AEC for the sediment quality was introduced as the reference values to evaluate the bottom sediment condition. Lead (Pb) concentration at inmost survey site exceeded the AEC largely. Total mercury (T-Hg) also showed high concentrations at all sampling locations, which exceeded the AEC (see Appendix A). This fact means that dredging and consequent disposal of the dredged silt will require careful consideration to prevent the contamination by harmful substances.

4.1.3 Littoral Drift

In the port area, considerable sand accretion has occurred along the main breakwater. The accreted sand seemed to have come from a beach south to the port being carried over and/or passed through the breakwater made of rocks and stones as estimated in the report cited above.

4.1.4 Air Quality

The air quality in and around Takoradi Port does not show the serious situation as a whole, though the nuisance due to the dust from the clinker for GHACEM appears at and around the cement processing facilities.

The Study Team, therefore, carried out a field survey focusing on the dust concentration at eight (8) locations in and around the port area in August 2001. Sites near manganese loading facility and the clinker jetty revealed high concentration, though they still did not exceed the Environmental Quality Standards of Ghana (see Appendix A).

4.1.5 Noise

The Study Team carried out a field survey on noise at seven (7) locations in August 2001. All measurement sites were located in the port area or the neighboring commercial/industrial area. Almost all of the obtained data met the Environmental Quality Standards of Ghana (see Appendix A).

4.1.6 Biota

(1) Aquatic Biota

There found no significant aquatic species that is endangered or academically valuable from existing reports and literature in the vicinity of the port area.

The continental shelf extends up to 80 km broad off the eastern to central part of Ghana. From Takoradi and eastwards, important fishing grounds of gill net fishing and purse seine fishing spread in a coastal zone up to 40 km from the coastline. According to the Fisheries Department of Western Region, there are spawning and fishing grounds for shrimps off Takoradi at water depths between 20 and 50 m, and spawning and feeding grounds for the Round Sardinella from 30 m and outwards the shelf.

(2) Terrestrial Biota

There is very little significant natural vegetation around the Takoradi Port, because the town surrounds it. In the port area, no green area exists. The high level of human activity both in the port and town has resulted in the disappearance of most of the wildlife.

4.1.7 Odor

The odor caused by the water/sediment quality could not be detected through the repeated field reconnaissance. The smell of cacao beans from sheds, however, seemed to be a nuisance to some of port workers. The smell was not sensible for most of local people in the town area.

4.1.8 Road Traffic

There are three (3) access roads to the port, two fairly big roads and one small road. A traffic count conducted by the Study Team in August 2001 enumerated a total of 9,000 vehicles including in and outbound traffic at 2 entrances (see Appendix A). Lines of articulated vehicles and trucks parking and waiting for the loading/unloading were often observed on the main access roads, though they occupied less than 10 % of the total traffic volume.

4.1.9 Waste

The solid waste at the port premises is usually garbage generated by calling vessels and port users (workers and visitors). An average of 5 tons of solid waste is generated per month. This amount is, however, dependent on the ship calls per month.

Sewage is generated on board vessels and the port users (visitors and workers). The Port's waste management division has two sewerage disposal tankers, which siphon the sewerage tanks of vessels (on request) and dispose off at designated point within the Takoradi metropolis. These tankers are also responsible for collection of domestic sewerage from places of convenience that have been adequately provided to serve 12 people per time. This provision is made for every berth at the port.

Oil wastes are usually generated from the calling ships and they may pose a treat to the environment within the port area. The GPHA has no facility for ships to discharge oil waste at the Takoradi port. However in the event of a spillage pumps and skimmer are mobilised at short notice for clearing of the spillage.

4.1.10 Fishing Industry

Sekondi is a major fishing town with a commercial harbour, located to the east of Takoradi Port. The fishing harbour caters for both inshore boats and large fishing trawlers and purse seine vessels. The fishing harbour (now Bosomtwi Sam Fishing Harbour) received a boost after its rehabilitation through Japanese Grant Aid and now handles a good portion of the country's fish imports and exports. All villages along the coast of Western Region are actively involved in fishing.

4.1.11 Population Distribution

The Metropolis has a population strength of 357431, and a daily floating population of 8000 made up of people that commute from the neighbouring districts and suburbs, into the city for trade, industry and other civic activities. It has a growth rate of 2.9% per annum, and offers a large skilled labour force, as well as a major potential market.

4.1.12 Ethnicity and Religion

The metropolis has its roots from the Ahantas. Fantes and Guans also occupies a considerable composition rate. Within the last 10 years the Sekondi-Takoradi metropolis has not recorded any major conflict between the ethnic groups. There, however, have been issues of litigation and

chieftaincy dispute between the natives in the communities.

In terms of religion, Christians form 86.1 %, while Moslems and traditionalist constitute 8.1% and 0.3% respectively.

4.1.13 Existence of Slums and Illegally Occupied Areas

Slums and illegally occupied areas are a common feature in the suburban areas within the metropolis. Prominent areas include the New Takoradi and Kwesimintsim townships in the Takoradi sub-metropolis and in Sekondi, the part of European township can be considered as such.

4.1.14 Cultural Assets

The Western Region is endowed with rich natural resources and cultural assets, which make the region a major tourism destination. The tourism assets in the region have been classified into tourist sites, historical preserves (forts and castles) and events (festivals).

(1) Tourist Sites

The sandy and sunshine beaches are at Essipon, Paradise Beach, Essikado sports club, Whin River Estuary, Busua Pleasure Beach at Busua, Takoradi Sports Club Beach and African Beach. There are also inland water bodies, which include Jewi Wharf, Lake Broso, Bobo Ewusi and Essei Lagoon.

(2) Historical Preserves

The historical preserves include:

- Fort San Sebastian (Shama) used as court, Post Office Traditional and City Council Office.
- Fort Orange (Sekondi) used as lighthouse by Ghana Ports and Harbours Authority.
- Egyam Grotto
- Historic Core District of Sekondi

4.2 Tema Port

4.2.1 Water quality

A field survey was carried out in the time zone of the low water on 23rd January 2001 to obtain the worst water quality condition. The surface water was sampled at four (4) locations in and around the port basin and brought to a laboratory for chemical analyses.

The water quality in and outside the port basin did not show a significant difference in terms of the eutrophication level indicated by DO, BOD, and COD. This is resulted from the highly polluted coastal water that receives a lot of pollutants from Accra and other coastal districts and flows easterly along the shore. Oil and grease revealed higher concentrations in the port basin than

outside. Ship-related activities may account for this distribution pattern (see Appendix B).

COD in stations 1 and 4, and oil and grease in stations 1 and 2 showed higher values than AEC, which is reference values of environmental quality (see Section 4.1.1 and Appendix B).

4.2.2 Bottom Sediment Quality

A field survey on the bottom sediment quality was conducted at the same time as the water quality survey. Four (4) samples were all collected from the port basin, because a rocky substrate covered the extensive area outside the port basin.

COD and total sulfide (T-S) showed high concentration, which is higher than those of many polluted port areas in Japan. As for the heavy metal concentration, total chromium (T-Cr) and total mercury (T-Hg) revealed the objectively high values (see Appendix B). The comparison of these data with AEC strongly appeals that dredging and other bottom-disturbing activities, if any, will need the intensive care not to disperse the contaminated bottom sediment.

4.2.3 Littoral Drift

The effect of the littoral drift is not obvious in and around Tema Port. Hard rock substrate forms the sea bottom surface of most part of the port basin, and the sand composed of the bottom sediment very little.

4.2.4 Air Quality

Tema has been built as an industrial city and many of the major industries in Ghana are located there. The Study Team carried out a field survey in August 2001 focusing on gas and dust concentrations at nine (9) locations. Obtained concentrations were low enough to satisfy the Environmental Quality Standards in Ghana (see Appendix B).

4.2.5 Noise

The Study Team conducted a field survey on noise in August 2001. Nine (9) measurement sites were located in and around the port area. Some sites showed higher noise levels exceeding the Environmental Quality Standards in Ghana. Particularly, roadside noise level at the Ramsar Site was significantly higher than Environmental Quality Standards (see Appendix B).

4.2.6 Biota

(1) Aquatic biota

Field reconnaissance surveys found that filamentous green algae dominated the aquatic flora on the quay wall of the port, indicating the deteriorated water quality condition. Balanoids, limpets, snails, isopods, and crabs were also found on the quay wall of various locations.

The composition of fish community in the port appeared poor at low tides, composed of fry and

small pelagic fish.

(2) Terrestrial Biota

There is very little significant natural vegetation around the Tema Port, because the City and the Coastal Savannah surround it. It should be noted, however, that Sakumo Lagoon that has been registered as a Ramsar Site forms a distinct ecosystem at 2 – 3 km west to the Port. This is a conservation area for, especially, waterfowl habitats designated by the Convention of Wetlands of International Importance Especially as Water Fowl Habitat (Ramsar Convention, in short).

A field survey on the terrestrial fauna and flora conducted in the vicinity of the Port excluding Ramsar Site in May 2000 found out 5 species of trees and shrubs, 16 species of grass and herbs, 3 species of mammals, 3 species of birds, 3 species of lizards, and 3 species of snakes. There was no species designated as of special needs to be conserved.

4.2.7 Odor

The odor caused by a wastewater outlet was detected during the field reconnaissance. The odor disappeared when the flood tide submerged the outlet beneath the sea level.

4.2.8 Road Traffic

The transportation of cargo to and from the port involves considerable vehicular movements. The port has three (3) main accesses. The trucks enter the Port by the eastern gate and exit from the central gate and the eastern gate. The western gate is used mainly for delivery of imported vehicles.

The results of a field survey on the traffic volume by the Study Team in August 2001 revealed 1,600 trailers and trucks came in and went out of the Port through eastern and central gates per day. In addition, more than ten times of other cars were counted (see Appendix B). This heavy traffic has caused noise nuisance along roads.

4.2.9 Waste

Tema port generates an average of 972.5 tons of solid waste per month. This waste is recollected at about 5 tons per refuse truck at an average number of 6.5 trips per day. More solid waste is recollected during the weekdays than the weekends. The solid waste is sent to the Kpone Final Refuse Dump of the Tema Waste Unit of the Tema Municipal Assembly (TMA). The TMA charges ¢ 15000 per each trip by the refuse truck. About 12.5 tons on the average, of solid wastes per day, out of the above mentioned refuse quantities, emanate from the vessels that dock at the port.

Domestic liquid waste generated at the port, from workers, enters the Tema centralised sewage system. An average of 1740 people enters the harbour (fishing and commercial) everyday. The estimated minimum amount of liquid waste generated by these persons is 3480 gallons per day.

With regards to the sewage from the vessels, the GPHA makes an average of 4 trips per month at the request of the vessels' officials. The waste is siphoned into cistern trucks and sent to the Tema Manhean (Paradise Beach) Liquid Waste Dumping Site. Each trip evacuates an average of 2 tons, and the TMA charges ¢ 15000 per trip.

There are no reception facilities for handling waste oil and oily bilge water from ships. This has led to oily waste waters being discharged by ships into the harbour waters and this is particularly significant in the fishing harbour. Occasionally waste oils from ships are collected by local contractors for use ashore in preparation wood preservatives.

4.2.10 Fishing Industry

The major fishing harbour within the district and the industrialised township has enabled the fishing activities and other ancillary trades such as boat building and repair, fish processing plants and small-scale trading as means of employment to thrive satisfactorily. The Tema district comprises three major fishing villages namely Kpone to the East, Tema in the central, and Sakumono to the West. Fishermen number approximately 4800 within the district. This district contributes approximately 27 % of the national fish production with the artisan sector contributing about 20 % in the Greater-Accra region.

4.2.11 Population Distribution

Tema in 1951 was a small village with a population of about 2000. With the construction of the Port, Tema grew into a sub-urban area and in 1960 had a population of 25223. Expansion of commercial and industrial activities caused accelerated population growth in the township by about 13.4 % over the 1960 figure to 101000 in 1970. The estimated population of Tema, according to a census as of December 1988, stood at 302815.

Based on the census in 1988 above, population in 2000 was estimated assuming growth rates of 4.5 % and 3.5 % for urban Tema and rural Tema respectively. This is because the results of the 2000 population census have not been released yet. The higher growth rate than the national average of 3.2 % (1992-2000) is attributed to rural-to-urban migration.

4.2.12 Ethnicity

(1) Composition of Ethnic Groups

Tema is land for the indigenous Gas, however presently almost all the ethnic groups are represented in the city. Among the major ethnic groups are the Ga-Adangbe, Akan, Ewe, Guan, Mole-Dagbani, Gurma, etc. In terms of size, the Gas constitute the majority, followed by the Akans, and the Ewes, as the rest follow suit. There is also a sizeable group of immigrants, Non-Ghanaian Africans, Europeans and Asians. The bulk of the African group of immigrants is mainly from the neighbouring West African countries.

(2) Conflicts Between Ethnic Groups

According to the Public Relations Officer of the Police Service (Tema Harbour Police Station) in Tema, there are no records of conflicts between the ethnic groups in Tema. All the representatives of the relevant organisations, with regards to this survey, could not recall, in their lifelong experience, any ethnic disturbances taking place in Tema.

4.2.13 Existence of Slums and Illegally Occupied Areas

Sites 2, 5 and 12 of Community One, New Town, Sakumono Village and Ashaiman, could be considered as slums. The TMA officials preferred to refer to Ashaiman as a town whose growth preceded infrastructure development, and that a face-lifting programme, dubbed URBAN 4, consisting of road networks, refuse collection systems and drainage construction, is being presently implemented.

With regards to Sites 2, 5 and 12 of Community One, the officials of TMA explained that these Sites are very old communities, which have barely enjoyed any maintenance since their construction, and have therefore deteriorated over the years. New Town and Sakumono Village are indigenous fishing communities, which are similar to other such communities along the coastal belt of the country.

With reference to the illegally occupied areas, both the Tema Development Corporation (TDC) and the Tema Municipal Assembly (TMA), custodians of the bulk of Tema land, usually demolish any illegally erected structure in the Metropolis. The land and building laws are strictly enforced in Tema with the help of a well co-ordinated task force, and this has prevented illegally occupied areas in the Metropolis.

4.2.14 Cultural Assets

The major cultural assets and activities are linked with the indigenous settlements, namely Tema New Town (Manhean), Kpone and Sakumono Village.

There are three major shrines and two important revered sites in the above-mentioned settlements. They are Wulomo, Nyado, Gao, and Amgmu Rock, and Shajotso (The Baobab Tree) respectively. Their locations are far from the port area.

Chapter 5 Port Administration and Management System

Port Administration and Management by GPHA including laws and regulations; composition of Board of Directors; implications of the Landlord Port Bill; the labour force, privatization, and marketing efforts will be discussed in this chapter.

Finally, comments on port management and operation/port promotion will be made.

5.1 Laws and Regulations

(1) Basic law on management body of Ghana Sea Ports

Ghana Ports and Harbours Authority (GPHA) was established by the "Ghana Ports and Harbours Authority Law, 1986"(PNDC Law 160[1]). This law defines the Board and function of the GPHA, the assets made available to it, the staff and its personnel and the financial organization of GPHA.

(2) Landlord Port Bill (Basic law upcoming)

The main features of Port Development Policy based on Ghana Trade and Investment Gateway Project (GHATIG) are:

i) changing the status of GPHA from that of a service port to that of a Landlord Port
ii) introduction of more competition into port operations by increasing private sector participation.

According to the Government's Port Development Policy, GPHA is to change its status from a service to a landlord port. In July 2000, the Authority drafted the Landlord Ports Bill. The Bill will pass the parliament during the 2nd quarter of 2001, if deliberations on the Bill proceed smoothly.

(3) Port related acts and legislation

Legislation relevant to Ghana Sea Ports is as follows:

i) Labour Decree, 1967 (NLCD 157)
ii) Labour Regulations, 1969 (L.I.632)
iii) Workmen's Compensation Law, 1987 (PNDCL 187)
iv) Customs, Excise & Preventive Services Act, 1993 (PNDCL 330)
v) Free Port Act, 1995 (Act 504)
vi) Free Zones Act, 1995 (Act 505)
vii) Ghana Corporate Plan 1995-1999 or the Business Plan 2000
viii) GPHA Human Resource Management Manual
iv) Collective Bargaining Agreement - between GPHA and the Maritime & Dockworkers' Union of TUC (Ghana), 1997-1999

[1] *PNDC Law 160: Provisional National Defense Council Law 160*

5.2 Organization of Ghana Ports and Harbours Authority (GPHA)

5.2.1 Historical Background

In 1978, Ghana Ports Authority (GPA) was spun off from Ghana Ports and Railway Authority.

In 1986, Ghana Ports and Harbours Authority (GPHA) was set up by the above mentioned PNCD Law 160 as a statutory government corporation. It constituted the merger of the GPA and the two public cargo handling companies - the Ghana Cargo Handling Company (GCHC) and the Takoradi Lighterage Company (TLC).

When GPA was established in 1978, GPA hired only motivated and able workers. However when GPHA was established in 1986, GPHA hired indiscriminately, including unskilled workers.

5.2.2 Board of Directors at Present and in Future

Under PNDC Law 160, GPHA owns and operates the ports of Tema, Takoradi and Fishing Harbour at Tema. The former two ports are semi-autonomous in management and operations while the GPHA's Headquarters is in charge of general policy, overall financing, investment planning, training and other areas of common interest.

The present GPHA is under the Ministry of Roads and Transport (MORT) and it is administrated by an eleven-member Board of Directors, which is comprised of the following persons:

i) Chairman
ii) Director-General of GPHA
iii) Two Directors of the Ports of Tema and Takoradi
iv) Representative of the Ministry of Roads and Transport
v) Four representatives of Port Users, consisting of:
   - the Shippers' Council
   - the Chamber of Commerce
   - private shipping companies
   - the Managing Director of Railways Corporation
vi) two other persons, one of whom shall be an employee of GPHA

The chairman shall be appointed by the Council.

The daily administration of the ports, however, devolves upon the Director General who is the Chief Executive, the two Directors of Port, head of department (at Headquarters, Port Level and Fishing Harbour) and principal officers of GPHA.

According to Final Draft Landlord Ports Bill, July 2000 (submitted to GPHA), the governing body of a port authority upcoming shall be the Board, which shall consist of no more than eleven (11) members, that is:

i) a Chairman;
ii) a representative of the Minister responsible for ports;
iii) a representative of the Ghana Shipper's Council;
iv) a representative of the Ghana Chamber of Commerce;

v) a representative of the Shipowners and Agents Association;
vi) a representative of the Port Operations;
vii) the General Manager of the Ghana Railway Corporation;
viii) three other persons knowledgeable and experienced in the port and/or transport industry, of which one at least shall come from the private sector ; and
ix) the Director General of the port authority

All members of the Board including the Chairman shall be appointed by the President.

The relations between the above mentioned Boards at present and upcoming, MORT and port authorities are shown in Figure 5.2.1 and 5.2.2 respectively.

5.2.3 Function of GPHA at Present and after Passage of Landlord Port Bill

According to PNDC Law 160 in 1986, the present functions of GPHA are summarized as follows:

a) to make plans for development, management, and operation of the ports,
b) to build the port,
c) to develop the ports,
d) to manage, to operate, and to maintain the ports, and
e) to control the ports.

On the other hand, according to the draft final Landlord Port Bill, July 2000 Port authorities shall:

a) prepare and update a port master plan, regulate and control the development within ports;
b) maintain and deepen the approaches and navigable waters;
c) under the coordination of the Environmental Protection Agency or in collaboration with other agency,
   i) protect and preserve the environment and implement Oil Spill Local Contingency Plans;
   ii) provide or cause to provide receptacles for receiving waste oil;
d) enhance safety and security of vessels and maintain navigational aids and equipment;
e) propose to Government the port policies, implement and keep such policies,
f) regulate navigation, dredging, and operations on ship, cargo handling and passengers;
g) authorize and control the erection and use of port facilities and equipment;
h) license small ships to lie, ply for hire;
i) cause the Minister to establish, direct, determine and license pilotage related;
j) disseminate navigational information;
k) promote the use, improvement and development of the port and participate in the activities and meeting on ports; and
l) generally discharge any other function which is necessary.

The above mentioned port authorities as Landlord Port may:

a) carry on the business of pilotage;
b) operate crafts for towage, fire-prevention and the protection of life;
c) provide, when not provided by other parties, the necessary facilities for port operations;
d) engage in operations for salvage of ships and cargo;
e) enter into any agreement for the supply, construction, manufacture, maintenance or repair by that person of any property which the authority may require for the efficient discharge ;
f) prescribe rate, charge and dues for services provided by the port authority and specify the

persons liable to pay such rates, charges and dues.

5.2.4 GPHA Personnel

(1) Permanent staff

In December 1985, GPA, GCHC and TCL appear to have had a combined employment of 5,682 permanent staff and 2,200 casual workers. This labour force was inherited by GPHA in the 1986 merger and, since overstaffing was a generally recognized problem, permanent staff was gradually reduced to 4,891 on July 1988, 4,774 on 1st January 1989, and 4,537 on 31st July 1989 (20% decrease to 1985 year). In 2000, there are 3,118 permanent staff in GPHA.

Furthermore, specific guidelines for laying off workers were agreed on with the trade union, the State Enterprises Commission, and the Ministry of Transport and Communication and the Ministry of Mobilization and Social Welfare in August 1989, GPHA laid off 1,439 individuals, or 32% of its labour force. Chronological changes in the size of GPHA's labour force are shown in Table 5.2.1

(2) Casual labour

Casual labour is an important element of port labour systems. The uneven nature of ship arrivals and departures and the associated manual workload create a huge variation in the demand for labour at the port of Tema and Takoradi. Casual labour, which is available for assisting such workload, generally fills the fluctuating labour requirements.

Casual labour employed by GPHA（2,290 casual staff in 1999）is classified into pure casuals and permanent casuals. The latter are floating workers whose work schedules make them almost permanent workers. The permanent casuals are made up of mainly gangs and clerical staff.

The gangs are classified into three groups: 1) stevedoring gangs which consist of 16 workers; 2) shore handling gangs which consist of nine workers; and 3) cocoa shed gangs which consist of 17 workers. At Takoradi Port, permanent casuals work only in the cocoa sheds.

Permanent casuals are represented by the same union as the Junior staff and they receive sick benefit, bonuses, incentive packages, leave allowance and death benefits. Pure casuals receive sick benefits for only themselves (not for their family members as in the case of the permanent casuals), bonuses and leave allowances. Numbers of casual labour at Tema port are shown in Table 5.2.2.

5.2.5 Present Organization of Port Administration

The Organization Structure for GPHA at the Headquarters, the Ports of Tema and Takoradi are shown from Figure 5.2.3 to 5.2.5.

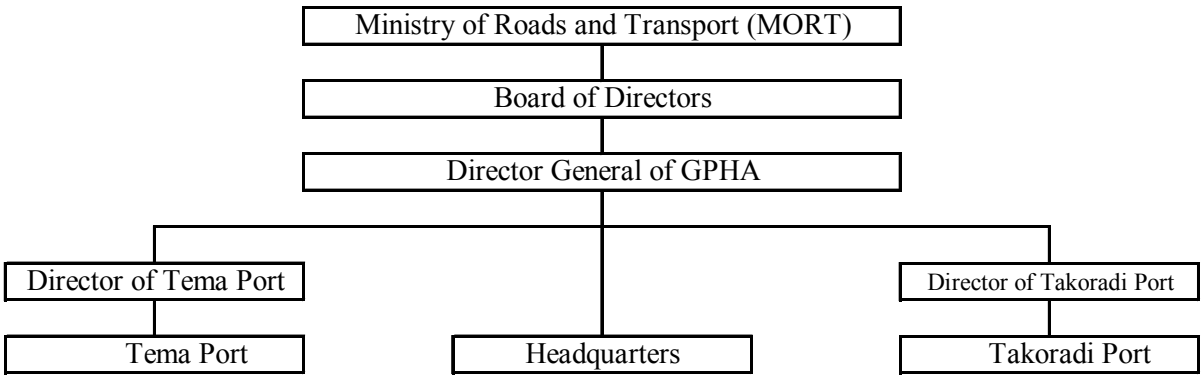

Figure 5.2.1 Relation between MORT, GPHA and the Board of Directors as of December 2000

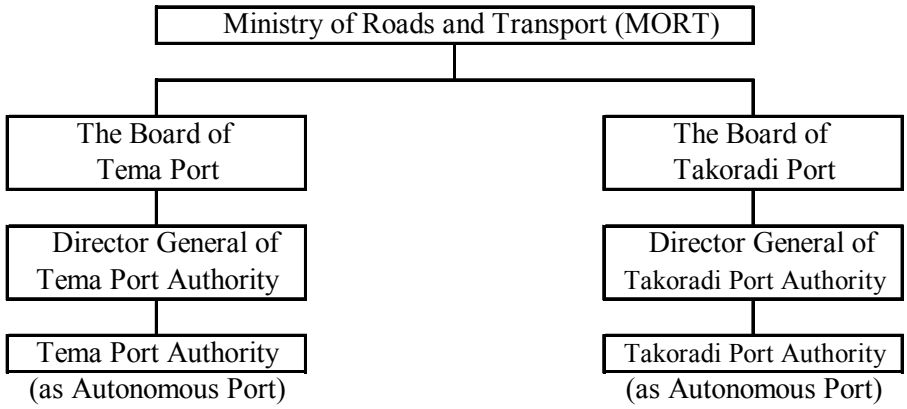

Figure 5.2.2 Relation between MORT, GPHA and the Port Authorities and the Boards in Future

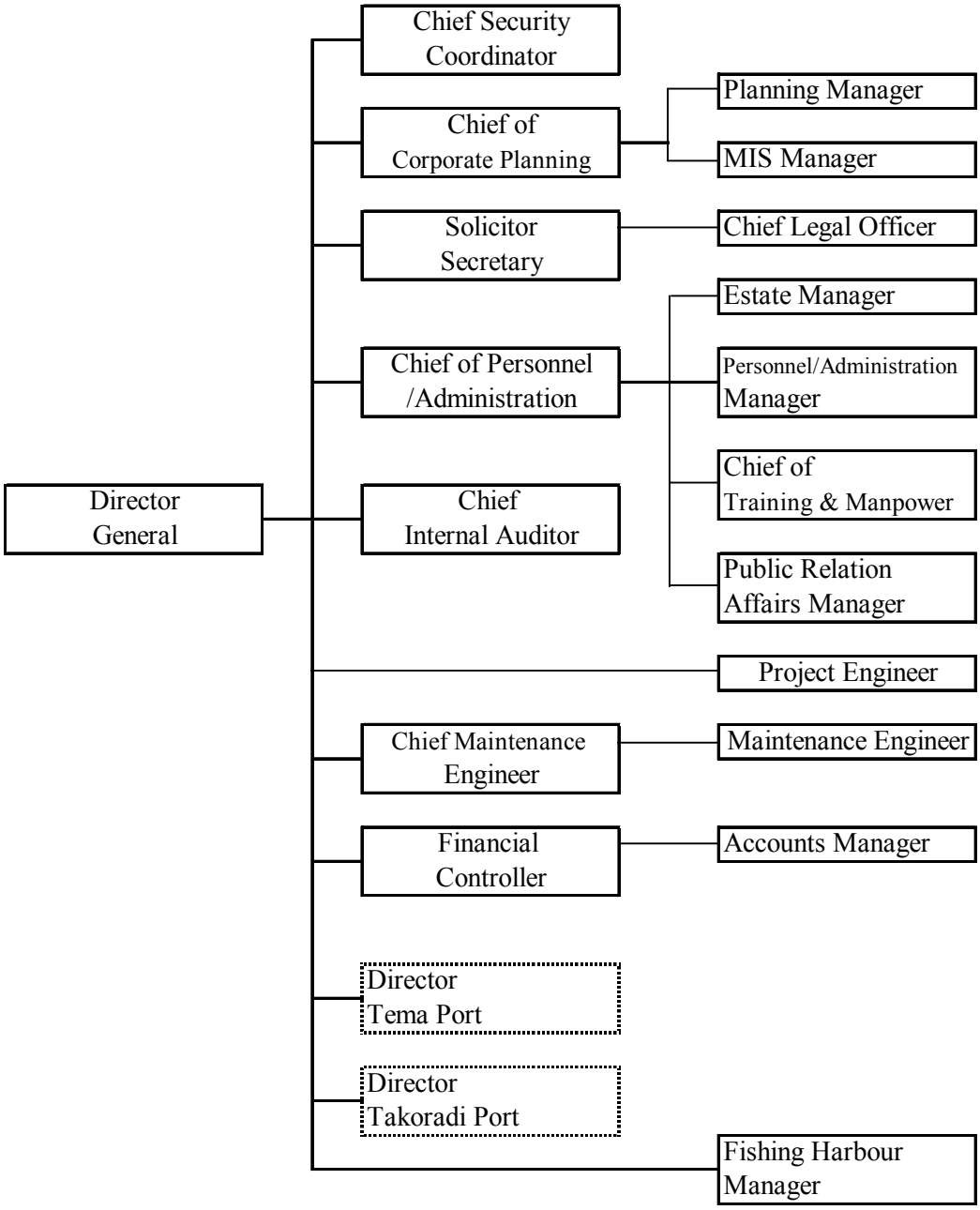

Figure 5.2.3 Organization Structure for Headquarters of GPHA as of December 2000

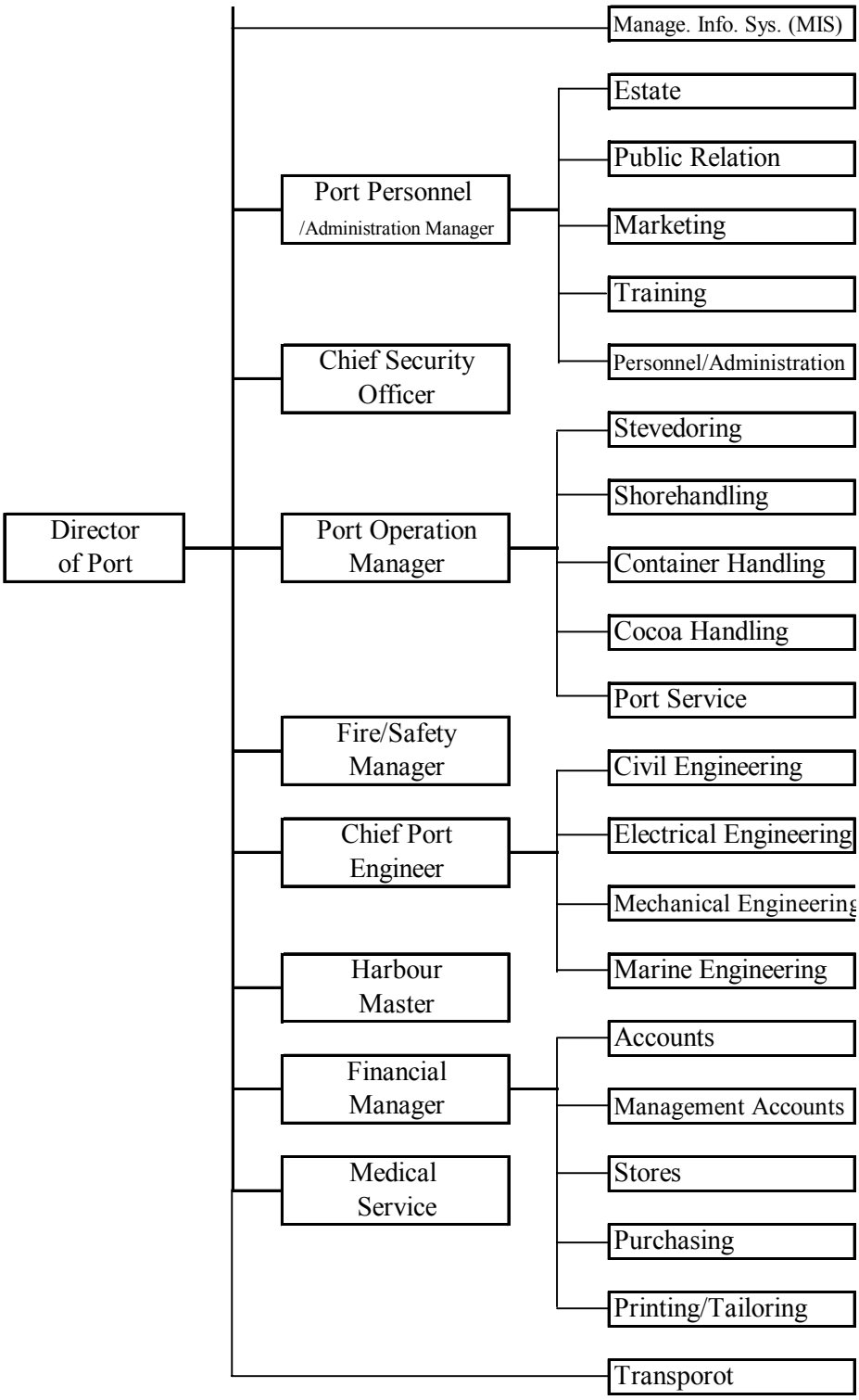

Figure 5.2.4 GPHA Organization Structure for Port of Tema as of December 2000

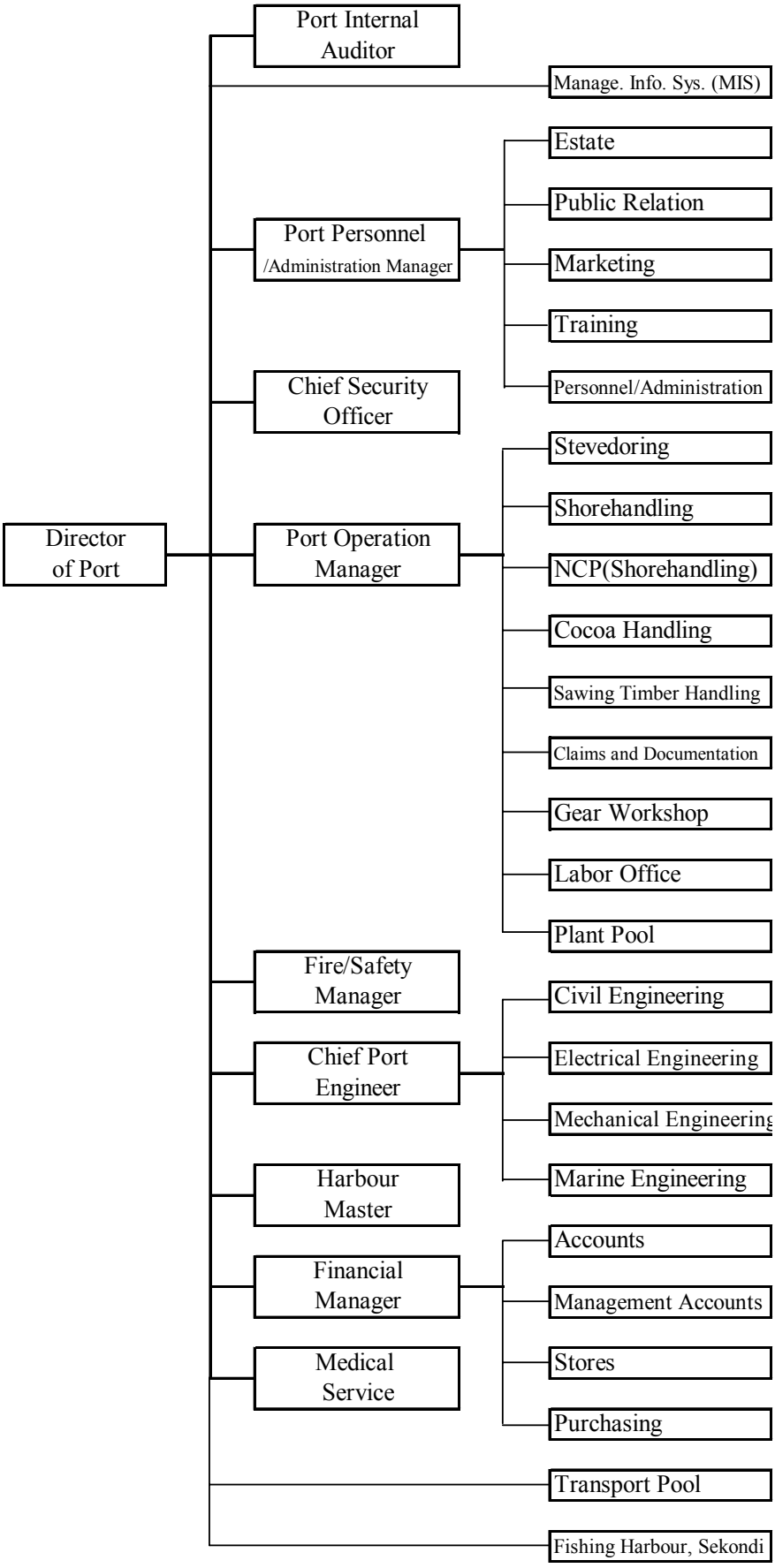

Figure 5.2.5 GPHA Organization Structure for Port of Takoradi as of December 2000

5.3 Privatization of Port Activities

5.3.1 Privatization of Port Activities at Present

As for the privatization of Tema port, three private companies, namely Speedline Stevedoring Company Limited (SSC), Atlantic Port Services Limited (APS) and Express Maritime Service Limited (EMS) are engaged in stevedoring works. Before EMS, which only recently began to participate in the work, acquired an operation license, the shares of the cargo handling volume for SSC and APS were fixed at 10% and 15% of the total cargo volume for stevedoring work, respectively. At present, the above-mentioned three stevedoring companies have a 25% share of containerized cargo and 50% to general cargo. Details are shown in Table 5.3.1

Table 5.3.1 Share of Stevedoring Work for Licensed Companies in Tema Port

	Container (%)	General cargo(%)	Total (%)
SSL	10	10	10
APS	15	15	15
EMS	-	25	(25 of GC)
(GPHA)	75	50	(75 of Cont., 50 of GC)

Source: GPHA

In addition, two more private companies will participate in the stevedoring works (the shares of the cargo handling volumes for each companies are fixed at 10%, which is taken from GPHA's share) in September 2001 and one more private company will come within the year of 2001. GPHA plans to transfer it share of stevedoring works to several private companies in the middle of 2002.

5.3.2 Port Privatization Regulated by Landlord Port Bill (Draft)

According to GPHA, all cargo handling activity in the ports of Tema and Takoradi will be operated by the private sector after the Landlord Port Bill is approved by Parliament.

Landlord Port Bill (Draft) specifies the procedures and types of private sector participation.

(1) Private sector participation plan

"Private sector participation plan" means any proposal by a port authority to transfer or dispose of any or all of its undertakings to the private sector.

GPHA formulates the plan and based on it private sector participation is carried out. Three types of private sector participation are explained blow:

i) Build-Operate-Transfer scheme (BOT scheme)

"BOT scheme" means a contractual agreement by which an operator pre-finances facilities or equipment, operates it for a period agreed upon with the port authority, and delivers it in full property to the port authority after such period of time.

ii) Concession

"Concession" means the award through a contract of the operation of existing facilities or equipment to an operator who may or may not, depending on the arrangement, participate in investments in the concession.

iii) Lease

Although "Lease" is not defined in the Bill, generally speaking, it means that the leasing would be implemented by the port authority based on revenue to be realized from the lease of the port land, facilities and equipment, or the operations of facilities.

5.4 Current Status of Computerized Information System

In 1981 the United Nations Conference on Trade and Development (UNCTAD) received a request from the secretariat of the Economic Community of Western African States (ECOWAS) to assist in the compilation of foreign trade statistics in their member states. After an initial evaluation it became quickly apparent that this would only be possible at the customs clearance offices and that the customs clearance procedures required modernization to achieve a quality result.

As part of technical co-operation activities to such requests of developing countries, UNCTAD has developed ASYCUDA (Automated System for Customs Data) to bring about a better management of Government finances through an institutional strengthening of Customs Administrations.

ASYCUDA is a computerized customs management system which covers most foreign trade procedures. The system handles manifests and customs declarations, accounting procedures, transit and suspense procedures. ASYCUDA provides for Electric Data Interchange (EDI[1]) between traders and customs using EDIFACT (Electronic Data Interchange for Administration, Commerce and Transport) rules.

In such a wave of computerized information system in the recent past, the Customs Exercise and Preventive Service (CEPS) modified ASYCUDA to suit the Ghana customs clearance system. The Ghana version of this software programme, the Ghana Customs Management System (GCMS) was aimed at facilitating customs procedures and the activities in the maritime sector.

In spite of the laudable idea, GCMS was saddled with various problems ranging from lack of skilled personnel, lack of tools for its implementation, over-dependence on foreign consultants and lack of awareness even within the maritime community about the need for GCMS.

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[1] *EDI: EDI is defined by the United Nations Commission on International Trade Law (UNCITRAL) as 'the computer to computer transfer of commercial and administrative transactions using an agreed standard to structure the data pertaining to that transaction'.*

As a result of the above problems and the need to improve upon the present system, GCMS was reviewed along the lines of EDI networks of Singapore and Mauritius and the outcome was the adoption of the Ghana Community Network (GCNET).

GCNET is an autonomous body with stakeholders from CEPS, GPHA, Ministry of Finance, Ministry of Trade and Industry, Ghana Statistics Service, Ghana Shippers Council, Social General de Surveillance (SGS) and so on. However the network is managed by CEPS while the Gateway Secretariat acts as facilitators.

This EDI network is linked to all stakeholders and the shipping lines with the main purpose of facilitating port activities vis-a-vis import and export procedures, documentation, clearance of goods, warehousing and so on.

Without doubt GCNET EDI has many obvious advantages such as speed, low cost and accuracy. Nevertheless, the EDI steps should be taken to avoid mistakes of the previous system (GCMS) as well as creating awareness by educating and encouraging users and other beneficiaries to take advantage of this new information system.

5.5 Safety and Maritime Accident

(1) Records of maritime accident in the ports

Concerning marine accidents, only one incident occurred in Takoradi Port from January to September 2000. Details are as follows:

- A vessel M/V "Jobst Oldendorff" was sailing out of Takoradi port on 25th August, 2000, when her engines failed. It is resulted in the stern coming into contact with the shell plating of the hull, on the starboard side, near the accommodation of M/V "Shou Ning Hai", which was moored at No.1 Buoy.

(2) Junk vessels in/out of Tema port

There are the problems related to junk vessels in/out the Tema port. Junk vessels cause maritime accidents, obstruct port navigation and safety, and hamper berthing and the cargo handling.

5.6 Port Promotion

5.6.1 Marketing Section of GPHA

The marketing unit was established in 1994. It was placed under the Public Affairs Department at the Headquarters. It had two staff members, who were responsible for planning, implementing and controlling the marketing activities of the Authority.

In January 1999, the marketing unit was transferred to each port. Each port now has a marketing

section which is headed by a Marketing Officer who reports to the Port Personnel Administrative Manager.

Functions of the Marketing section include the following:

i) Analysing, planning, implementing and controlling marketing activities of the ports.
ii) Conducting marketing research and information gathering activities.
iii) Organizing promotional activities like advertising, exhibition, trade mission and so on.
iv) Establishing and maintaining conducive customer services/relations with port users.
v) Liaising with the training department to educate frontline and supporting staff on Port Marketing issues.
vi) Gathering information for publication of customer brochures.

5.6.2 Current Activities for Port Promotion/Sales

Current activities for Port Promotion/Sales include the following:

i) Advertising in International Maritime Trade journal to attract vessels to Ports of Ghana (this is done at the Headquarters).
ii) Exhibiting port facilities and services at local and international fairs.
iii) Occasional Trade Missions to landlocked countries (Burkina Faso) to attract their trade through the Ghanaian corridor (usually co-ordinated from the Headquarters)
iv) Trade visits to shippers in Kumasi and Northern parts of the country to attract shippers to use Takoradi Port.
v) Trade visits to shipping companies/agents to identify their problems and propose measures to resolve them.

International container shipping line/agents and their shipping routes calling the port are shown from Table 5.6.1 (1) to (3).

5.7 Present and Anticipated Problems

(1) Activities for Privatization

Following problems should be considered while GPHA will be privatized as landlord port.

①Promoting competition in cargo handling business

Cargo handling at Ghana seaports is managed under a public monopoly at present. The port users are dissatisfied with the lack of competition in the present port operation.
Even after the seaports become completely autonomous, the situation may not substantially change if the port authority permits only one private entity to act as port operator. Users have expressed concern that the Landlord Port Bill might simply transfer a public monopoly to a private one.
Considering the present cargo volumes of Tema Port and Takoradi Port, one or few

operators at each port would be adequate, though there is potential for multiple operators in future. If the port authority issues only one or few operation licenses in the port, the authority (GPHA) should have some control over the company to ensure that monopolistic or oligopolistic tendencies are not pursued.

②Treatment of workers dismissed due to reform

Many workers of GPHA will lose their jobs when GPHA will be transformed from a service port to a landlord port. Job opportunities as dockworkers would be decreased due to the rationalization of cargo handling operations by private companies. Without their cooperation, the reform could not be promoted smoothly. Adequate measures should be taken to deal with workers who will loose their jobs.

(2) Introduction of port EDI system

Although GCNet was already developed by CEPS, Ghana seaports should proceed with port EDI in cooperation with GCNet from the viewpoints of streamlining customs procedure and enhancing information management in the ports.

(3) Port promotion efforts by Takoradi port

The cargo traffic flow would likely concentrate at Tema Port which is close to Accra, the largest commercial area in Ghana. To compete successfully with Tema Port, it is important for Takoradi Port to immediately attempt to attract shipping companies through sales and promotion efforts.

Table 5.6.1 (1) Container Liner Service at Tema and Takoradi Port

Shipping line: MAERSK
Shipping agent: Maersk
Ports of call: North and South America, Southern Europe, UK, Asia, New Zealand, Africa(including Tema/Takoradi), Middle East, Australia
Service frequency: Weekly
Remark: Dry ventilated container, frat rack, reefer container, LCL

Shipping line: DELMAS
Shipping agent: Delmas
Ports of call: UK, Northern and Southern Europe, North America, Asia, West (including Tema/Takoradi), Central and South Africa
Service frequency: Weekly
Remark: Dry container, ventilated container, reefer container, flat rack, LCL

Shipping line: BACO
Shipping agent Panalpina
Ports of call: UK, Northern Europe Africa (including Tema/Takoradi)
Service frequency: Every other month
Remark: Dry container, break bulk, heavy lift

Shipping line: CMBT
Shipping agent: Saga
Ports of call: UK, Africa (including Tema/Takoradi), Asia, Northern and Southern Europe
Service frequency: Weekly
Remark: Dry container, ventilated container, break bulk

Shipping agent: Saga
Ports of call: North America, Australia, West and South Africa (including Tema/Takoradi)
Service frequency
Remark: Break bulk, Ro-Ro, dry container, project cargo, heavy lift, flat rack, bolsters, open-top container

Shipping line: CHINA OCEAN SHIPPING CO.
Shipping agent: Saga
Ports of call: Asia, East and South Africa (including Tema)
Service frequency: Monthly
Remark: Dry container

Shipping line: GOLOSTAR LINE CONTAINER
Shipping agent: Saga, ISAG
Ports of call: Middle East, Asia, East and South Africa (including Tema)
Service frequency: Weekly
Remark: LCL, dry container, open-top container, heavy lift

Table 5.6.1 (2) Container Liner Service at Tema and Takoradi Port

Shipping line: P&O NEDLLOYD
Shipping agent: Saga, PONL Agent
Ports of call: UK, Australia, New Zealand, North and South Europe, Asia, East and South Africa (including Tema), South America
Service frequency:
Remark: LCL, dry container, ventilated container, reefer container

Shipping line: GRIMALDI&COBELFRET
Shipping agent: Hull Blyth (formerly Liner Service)
Ports of call: UK, Northern and Southern Europe, Africa (including Tema/Takoradi)
Service frequency: Fortnightly
Remark: LCL, flat rack, dry container, ventilated container, break bulk, vehicles

Shipping line: MESSINA
Shipping agent: Ro-Ro
Ports of call: Southern Europe, Middle East, North Africa (including Tema/Takoradi)
Service frequency
Remark: Dry container, heavy lift, vehicles

Shipping line: MISTUI OSK
Shipping agent: Hull Blyth (formerly Liner Service)
Ports of call: Asia, South and East Africa (until Tema), Australia, New Zealand
Service frequency: Monthly
Remark: Dry container, open top container, reefer container, LCL

Shipping line: TORM
Shipping agent: Maritime Agencies
Ports of call: North America, West Africa (including Tema/Takoradi)
Service frequency: Monthly
Remark: Dry container, heavy lift, break bulk, LCL

Shipping line: CLIPPER
Shipping agent: Maritime Agencies
Ports of call: South America, Africa (including Tema)
Service frequency
Remark: Dry container, heavy lift, break bulk, LCL

Shipping line: DECO
Shipping agent: Westgate
Ports of call: UK, Northern Europe, West Africa (including Tema/Takoradi)
Service frequency: Every other month
Remark: Dry container, break bulk

Table 5.6.1 (3) Container Liner Service at Tema and Takoradi Port

Shipping line: OTAL
Shipping agent: Ro-Ro
Ports of call: UK, Northern Europe, Asia, Northern America, Africa (including Tema/Takoradi)
Service frequency: Fortnightly
Remark: Dry container, open top container, LCL, flat rack, bolsters, heavy lift, project cargoes

Shipping line: K-LINE
Shipping agent: Hull Blyth (formerly Liner Service)
Ports of call: Asia, Africa (including Tema)
Service frequency: Monthly
Remark: Dry container, vehicles

Chapter 6 Present Conditions of Takoradi Port

6.1 General

The original Takoradi Port was constructed in the 1920s as the base of navy operations and trade (1st Stage). From 1947-1953, major parts of the present breakwaters were constructed (2nd Stage). From 1953-1958, breakwaters together with berths were extended to complete the present framework of the Port. Design and supervision was carried out by a British consultant, Nasars Taylor Woodrow Limited. Contractors were also British. Takoradi Port is located about 250km west of Accra. Most of the main export products of Ghana such as bauxite, manganese, wood, and cocoa are shipped from this port.

6.2 Existing Facility and its Physical Conditions

6.2.1 Existing Facilities

Main port facilities of Takoradi Port are shown in Table 6.2.1. There are 9 berths; Berth No.1 to No.6, Oil Berth, Bauxite Berth and Clinker Jetty. Berth No.1 is used for the export of manganese and Berth No.5 and No.6 are usually used as one berth because the length of Berth No.6 is not long enough to accommodate RoRo vessels and container vessels. In addition to berths, Buoy No.1 and No.3 are also used for loading and discharging cargoes. Oil Berth and Bauxite Berth are located on the offshore side of Lee Breakwater. And Clinker Jetty is located to the north of Lee Breakwater, which is used for the export of bauxite and the import of clinker.

The deepest mooring facility is Buoy No.1 with a depth of 10.4m and the deepest berth is Berth No.6 with a depth of 9.5m. Buoy No.1 is used mainly by bulk carriers for the import of clinker and the export of manganese and bauxite. As for manganese, vessels load it at Berth No.1 (Manganese Berth) up to draft permitted and then shift to Buoy No.1 for further loading. Loading of bauxite is more complicated. At first bauxite is loaded to barges at Clinker Jetty and then loaded to vessels from barges at the Bauxite Berth up to draft permitted and vessels then shift to Buoy No.1 further loading from barges. Clinker is discharged at Buoy No.1 from vessels to barges and then discharged from barges to the belt-conveyor at the Clinker Jetty. West Lighter Wharf and North Log Quay are no longer used due to their shallow water depths.

There are 2 public sheds and one private shed for the export of the bulk cocoa beans on Lee Breakwater. There are 2 Cocoa sheds, 2 Timber sheds and one shed in the inner port area. CFS is located behind the bauxite storage area. A new container yard is located to the north of the North Lighter Wharf and another one is under construction adjacent to the existing one.

The existing port layout plan of the Takoradi Port is shown in Figure 6.2.1.

Table 6.2.1 Main Facility of Takoradi Port

(Breakwater, Berth)

Area	Facilities	Dimensions	Main Vessel Type
	Main Breakwater	L=2,360m	
	Lee Breakwater	L=1,830m	
	Channel	W=150m, D=11.3m	
	Turning Basin	A=84ha	
Deep Water Area	Berth No.1	L=159m, D=8.5m	BU(Manganesea)
	Berth No.2	L=168m, D=7.9m	GC, CO, CM, RO
	Berth No.3	L=152m, D=7.9m	CO, GC
	Berth No.4	L=182m, D=8.5m	RO, GC, CM, CO
	Berth No.5	L=82m, D=8.5m	
	Berth No.6	L=152m, D=8.9m	RO, CO
Inner Port Area	Buoy No.1	195m, 10.36m	BU
	Buoy No.3	193m, 9.2m	BU, GC
	Buoy No.4	181m, 8.4m	
	Buoy No.5	176m, 7.7m	
	Buoy No.6	174m, 7.5m	
	Buoy No.7	150m, 7.0m	
	Buoy No.8	91m, 6.0m	
	Buoy No.9	96m, 5.5m	
	North Lighter Wharf	80m, 3m	Small boat
	West Lighter Wharf	340m, 2m	
	North Log Quay	220m, 1.5m	
	Dock No.1		
	Dock No.2		
Seaward Side Area of	Oil Berth	L=183m, D=8.8m	TK(Oil)
	Bauxite Berth	L=154m, D=9.1m	BU(Bauxite)
	Clinker Jetty	L=137m, D=7.4m	BU(Clinker, Bauxite)

BU: Bulk carrier, CM: Conteiner/Multipurpose, CO: Container cellular,
GC: General cargo carrier, RO: RoRo vessel, TG: Tugbaot, TK: Tanker

(Storage Facility)

Area	Facilities	Dimensions	Main use
Deep Water Area	Unicontrol Shed		Cocoa
	Shed No.4		General cargo
	Shed No.5		
Inner Port Area	Copra Shed	562m2	Copra
	Cocoa Shed No.1	130m x 88m	Cocoa
	Cocoa Shed No.2	124m x 88m	Cocoa
	Shed No.1	2,313m2	Cocoa
	Sawn Timber Shed No.1	124m x 46m	Timber
	Sawn Timber Shed No.2	124m x 46m	Timber
	Shed No.7		CFS
	Container Yard		Container

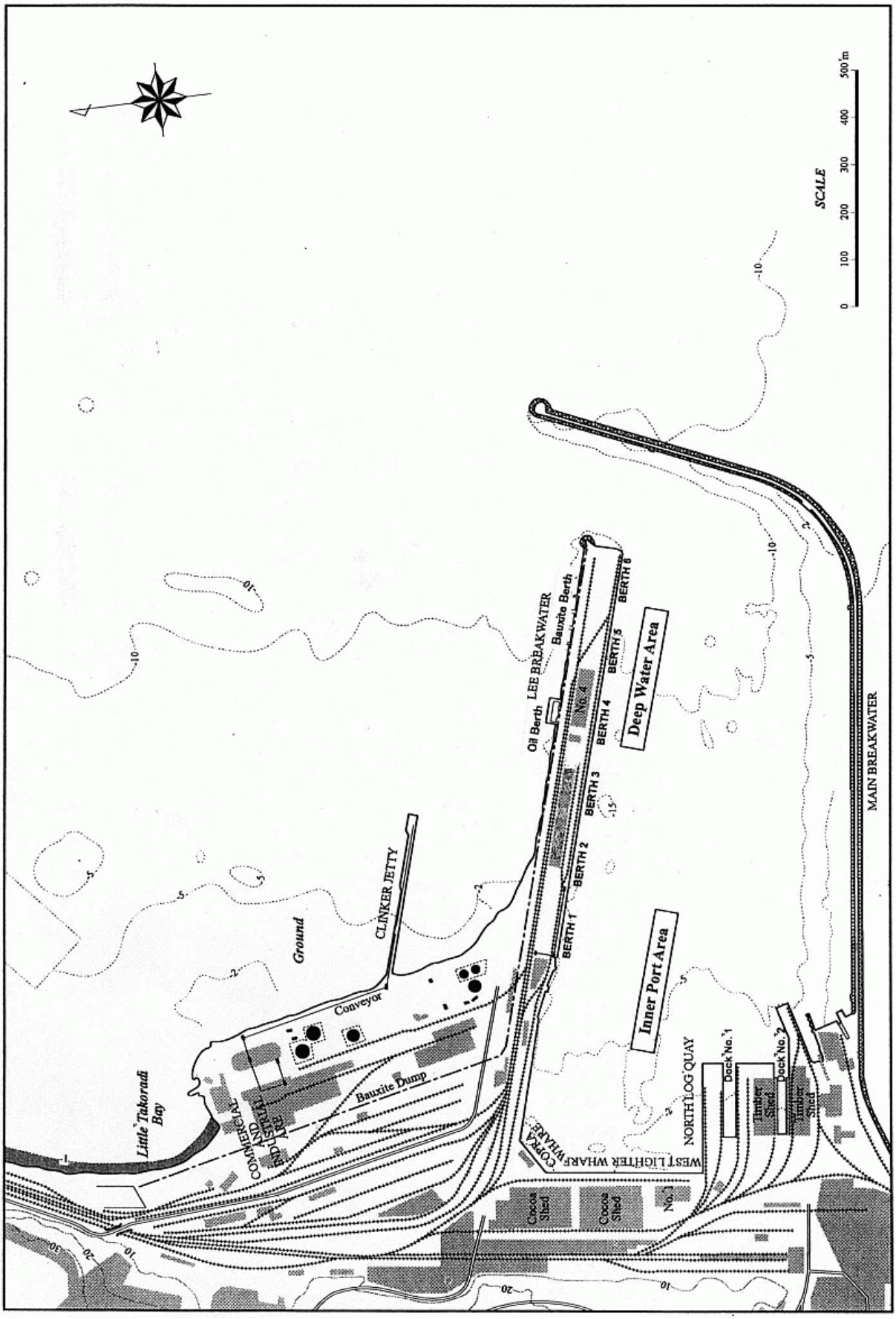

Fig 6.2.1 Existing Port Layout Plan of Takoradi Port

6.2.2 Physical Conditions

(1) Approach and Berthing

The Takoradi Port is divided into 2 harbour areas, an inner harbour and an outer harbour. The inner harbour is well protected from waves by 2 breakwaters, Main breakwater and Lee breakwater. The main wharf consisting of 6 berths (Berth No.1~No.6) as the deep water area is located along the lee breakwater. In the outer harbour the oil berth and bauxite berth are located on the seaward side of the lee breakwater, and the clinker jetty is located in front of the industrial area. The entrance of the inner harbour is opened to the north with the effective width at 185m. For approaching the main wharf ships are to turn right at the angle almost 90 degree. Under such conditions, a narrow width of the port entrance and a sharp turning, tug boats assistance is indispensable for berthing the main wharf. The maximum water depth around the main wharf is, as stated in the previous sub-section **6.2.1**, about 9.5 m.

(2) Basin

The inner harbour basin is well sheltered from waves by the breakwaters thus generally calm throughout a year. The basin was maintained by the regular maintenance dredging using a port owned grab dredger until 1986. The last maintenance dredging was in 1992, and since then no dredging has been carried out. According to the Port Master Plan Study conducted in 1994, the estimated siltation rate based on the latest maintenance dredging data is less than 15,000 cubic meters per year including sand sedimentation brought by overtopping of waves. It is however, also a fact that the inner harbour basin is decreasing its water depth gradually, especially around inner most part of the harbour.

(2) Natural Conditions and Environmental Conditions

The natural conditions and environmental conditions surrounding the Takoradi Port are described in **Chapter 3** and **Chapter 4** respectively.

6.3 Cargo Traffic

6.3.1 Cargo Traffic

Table 6.3.1 shows cargo handled at Takoradi Port from 1991 to 2000. Takoradi Port functions as the main export port in Ghana and exports typical Ghanaian products such as cocoa beans, sawn timber, manganese and bauxite. Ratio of export cargo traffic to import cargo traffic is about 6 : 4.

During this period, imports have been increasing at an average annual rate of 9%, which translated to a volume of 1,14 million tons in 2000. Major import cargoes are bulk cargoes such as clinker, wheat and petrol products. The share of bulk cargoes is 83% in 2000.

Export cargo volume has fluctuated in the last 10 years. In the first half of the 90's, export volumes fell due to the ban on the export of logs. But exports rapidly surged in the last two years, reaching 1.91 million tons. This recent jump was due to an increase in manganese and bauxite. Major export cargo is dry bulk cargoes such as manganese and bauxite and containerized cargo. Bulk cargoes account for 76% of the total, while containerized cargo accounts for 14% in 2000. Container exports are also increasing rapidly. The volume has increased threefold in the last 10 years.

Table 6.3.2 shows container cargo traffic in TEU basis. In the recent 10 years period, number of containers handled at the port increased by 4.4 times. Number of full containers for import is much less than that of export, that is one fifth of export container. Main commodities of export containerized cargo are cocoa beans, cocoa product, sawn timber and veneer.

Table 6.3.2 Container Cargo at Takoradi Port

(TEUs)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
IMPORT	**4,422**	**4,126**	**5,450**	**8,352**	**8,525**	**8,930**	**11,914**	**12,637**	**16,023**	**15,387**
full	1,828	2,003	2,354	2,703	2,781	3,450	5,328	5,994	5,101	4,660
empty	2,594	2,123	3,096	5,649	5,744	5,480	6,586	6,643	10,922	10,727
EXPORT	**4,690**	**4,016**	**5,274**	**8,384**	**11,958**	**14,091**	**17,229**	**16,704**	**21,820**	**24,418**
full	3,634	3,074	3,859	6,703	10,411	12,277	14,579	14,624	19,986	22,914
empty	1,056	942	1,415	1,681	1,547	1,814	2,650	2,080	1,834	1,504
TOTAL	**9,112**	**8,142**	**10,724**	**16,736**	**20,483**	**23,021**	**29,143**	**29,341**	**37,843**	**39,805**
full	5,462	5,077	6,213	9,406	13,192	15,727	19,907	20,618	25,087	27,574
empty	3,650	3,065	4,511	7,330	7,291	7,294	9,236	8,723	12,756	12,231

Source: GPHA

Table 6.3.1 Cargo Traffic at Takoradi Port

IMPORT	CODE	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CEMENT	BC	350		3,335	1,545		6,001		35,450		999
FERTILIZER	BC						4,268	2,950	3,230	6,356	4,771
GRAIN (CORN)	BC										
GYPSUM	BC										
MALT	BC										
OTHER	BC	90	5,404	203		19					
RICE	BC	1,988	4,506	1,703	5,157				5,500	5,488	
SOYA MEAL	BC										
SUGAR	BC	86		96							
WHEAT	BC					11,113					
TEU NETWEIGHT	CT	20,610	24,408	26,279	31,921	33,525	37,016	68,786	79,731	69,419	62,102
ALUMINA	DB										
CEMENT	DB	26,950	500					1,498			
CLINKER	DB	323,538	489,541	444,755	525,093	451,612	527,108	503,220	599,214	737,652	694,374
GRAIN (CORN)	DB	3,191									
OTHER	DB					64,933	65,915				
WHEAT	DB	59,361	53,691	91,478	82,048	56,575	41,346	65,806	99,724	89,120	102,371
CARS	GC	1,019	434	1,194	326	418	513	682	356	680	399
CHEMICALS	GC	507	6,107	5,026	73,509	3,885	29,402	10,579	12,272	34,884	18,061
LIME PRODUCTS	GC							76,471	101,709	43,205	95,070
MACH/EQUIPM.	GC	1,696	1,076	4,034	2,593	3,556	5,469	5,342	4,617	1,327	1,769
OTHER	GC	7,312	3,475	26,380	5,000	5,680	6,078	4,990	19,920	32,122	3,233
PAPER REELS	GC	5,710	7,801	2,431	2,701	3,205	2,899	1,763	1,727	50	571
PLATES	GC	74	208	128	159	424	795	1,255	6,779	867	1,554
RODS/PIPES	GC	2,343	1,290	2,257	1,492	440	6,017	3,167	5,567	2,306	293
STEEL/WIRE COILS	GC	486	896	1,558	492	2,014	330	1,314	1,574	4	
VEHICLES	GC	1,721	2,083	1,325	2,996	2,134	1,693	1,492	2,411	696	739
CHEMICALS	LB										
OTHER	LB										
PETROL PRODUCTS	LB	92,284	100,981	109,927	75,435	17,263	20,143	93,667	107,878	130,069	157,012
TOTAL IMPORT		**549,316**	**702,401**	**722,109**	**810,467**	**656,796**	**754,993**	**842,982**	**1,087,659**	**1,154,245**	**1,143,318**
EXPORT	**CODE**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
COCOA BEANS	BC	103,765	85,583	107,921	56,848	43,805	68,939	57,300	90,930	57,871	65,467
COFFEE	BC	258	311	155							
OTHER	BC	2,749	1,820	1,684	5,586	2,996	4,842	1,082	10,828	7,860	2,901
SHEANUTS	BC			3,749	11,142	12,645	11,600	15,710	6,200	1,401	2,000
TEU NETWEIGHT	CT	46,182	38,315	48,938	86,512	133,972	151,759	176,074	172,409	238,929	271,889
BAUXITE	DB	324,313	399,155	364,643	451,593	531,260	380,370	536,722	341,119	355,255	503,823
MANGANESE	DB	319,997	284,055	305,366	245,423	166,913	269,233	340,180	382,226	656,684	929,296
OTHERS	DB										23,097
WHEAT PELLETS	DB										5,516
LOGS	FP	163,520	121,804	362,748	425,605	62,255			9		
OTHER (e.g. Curls)	FP	4,981	1,865	11,587	25,769	43,955	10,555	10,670	14,386	16,152	9,287
SAWN TIMBER	FP	117,012	144,239	160,221	188,804	196,546	137,264	149,227	133,784	117,413	90,593
CARS	GC	16	7		3	1	1			4	2
COCOA PRODUCTS	GC	6,345	3,380	3,172	103						
LOCAL FOOD STUFF	GC					49	17	157	441	1,531	140
OTHER	GC	1,006	11,518	24,948	3,720	744	3,327	8,730	8,820	12,396	2,561
VEHICLES	GC	8	2		41					220	75
OTHER	LB		4,896		2,993		6,086			2,744	
PALM OIL	LB		3,339	5,858		4,977		9,095			6,551
TOTAL EXPORT		**1,090,152**	**1,100,289**	**1,400,990**	**1,504,142**	**1,200,118**	**1,043,993**	**1,304,947**	**1,161,152**	**1,468,460**	**1,913,198**
TOTAL IMPORT+EXPORT		**1,639,468**	**1,802,690**	**2,123,099**	**2,314,609**	**1,856,914**	**1,798,986**	**2,147,929**	**2,248,811**	**2,622,705**	**3,056,516**

Source: GPHA

6.3.2 Physical Distribution of Port Cargoes

According to the manifest of Takoradi Port on July/2000, the ports in Western Europe share 68 % of imported container cargoes in Ghana. Jebel Ali in Middle Eastern Asia accounts for 9.4 % of the total. Cargoes of 23 % of the total are shared by 11 ports including Japan. (See, Table 6.3.2.1, Figure 6.3.2.1) These imported general cargoes are distributed in Ghana locally. In the case of Takoradi Port, more than half of these cargoes are destined to Western Region (54 %). Greater Accra and Ashante followed to Western Region with 29 % and 14 % respectively. (Table 6.3.2.2, Figure 6.3.2.2) Some cargoes are transited to Burkina Faso. According to the manifest, cargo volume for Burkina Faso is less than 1 % of the total. However, its volume could not be confirmed by port statistic. It is said that the transit cargo to the landlocked countries via Takoradi Port will increase in the future.

Exported general cargoes are widely distributed to 31 ports in the world. Singapore functions supposedly as a hub port for cargoes from Ghana in the South-Eastern Asian area. (Table 6.3.2.3, Figure 6.3.2.3)

The contents of imported containers are listed by commodity in Table 6.3.2.4. Commodities include many kind of daily necessities such as clothes, imported food stuffs, materials for housings, utensils, medicines, electric appliances etc. Ghana relies on the imported goods largely.

While, the exported containers consist of major local products. (Table 6.3.2.5, Figure 6.3.2.5) Cargo types of these commodities shift from bagged cargo/break bulk cargo to container cargo.

Table 6.3.2.1 Origin Ports of Imported Containers
Takoradi Port

Origin	Cargo Volume (MT)	Share (%)
Hamburg	1,884	20.7
Bremerhaven	1,013	11.1
Antwerp	945	10.4
Jebel Al	852	9.4
Teesport	707	7.8
Marseille	541	6.0
Amsterdam	517	5.7
Dunkerque	279	3.1
Rotterdam	155	1.7
Felixstowe	103	1.1
Others	2,093	23.0
Total	9,089	100.0

Note: "Others" include 11 ports.
Source: Takoradi Port, Manifest/July 2000

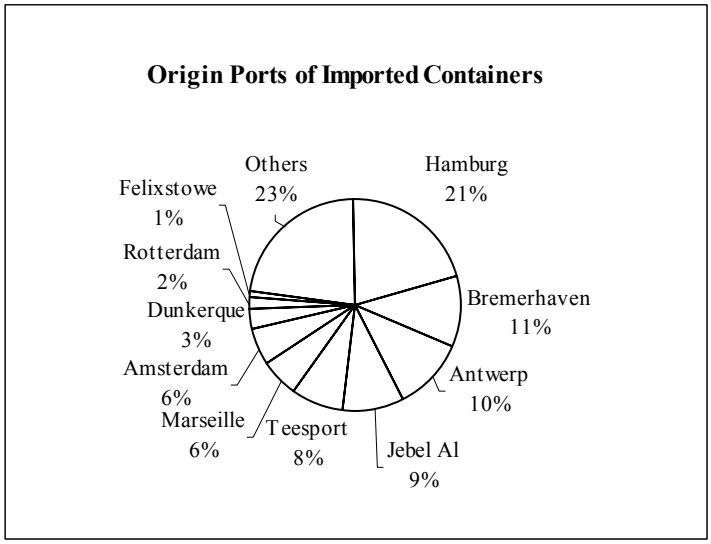

Figure 6.3.2.1 Origin Ports of Containers (Import) – Takoradi Port

Table 6.3.2.2 Destination Regions - Import
Takoradi Port

Destination	Cargo Volume (MT)	Share (%)
Western	4,423	54.0
Greater Accra	2,492	29.0
Ashante	1,213	14.0
Brong Ahafo	12	1.0
Northern	10	1.0
Ouagadougou *	40	1.0
Total	8,190	100.0

** Capital of Bulkina Faso*

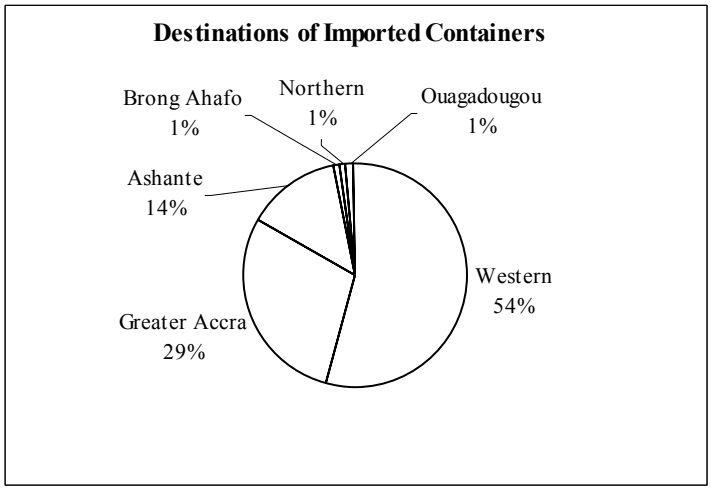

Figure 6.3.2.2 Destinations of Containers (Import) – Takoradi

Table 6.3.2.3 Destination Countries – Export Cargo
Takoradi Port

Destination	Cargo Volume (MT)	Share (%)
Singapore	3,131	20.9
Germany	1,904	12.7
Netherlands	1,772	11.8
India	1,319	8.8
USA	1,013	6.8
France	965	6.4
Canada	629	4.2
UK	598	4.0
Spain	544	3.6
Italy	504	3.4
Others	2,603	17.4
Total	14,982	100.0

Note: "Others" include 21 countries.
Source: Takoradi Port, Manifest/July 2000

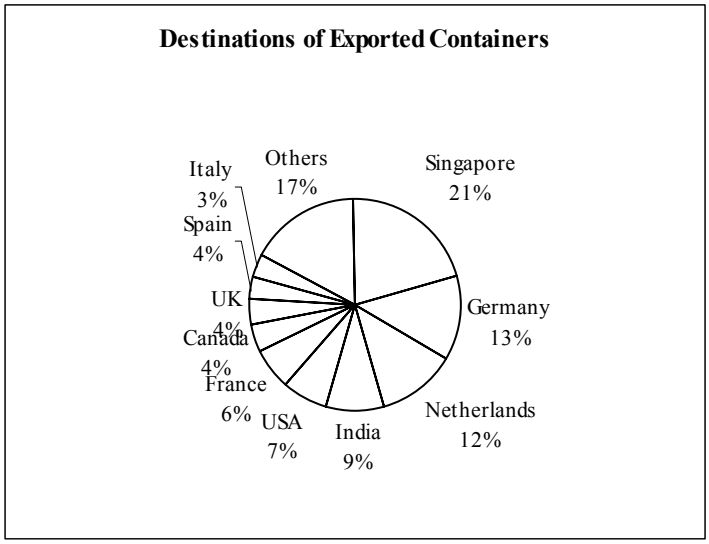

Figure 6.3.2.3 Destinations of Containers (Export) – Takoradi Port

Table 6.3.2.4 Contents of Containers by Commodity
Takoradi Port - Import

Commodities	Cargo Volume (MT)	Boxes	Share (%)
Chemicals	3,436	119	47.3
Mach./Equip.	1,591	93	21.9
Building Mat.	982	33	13.5
Other	493	71	6.8
Paper	305	13	4.2
Tire	175	6	2.4
Vehicle	169	10	2.3
Steel/Wire	66	2	0.9
Clothing	34	3	0.5
Foodstuff	10	1	0.1
Unidentified (loaded)	NA	918	NA
Empty	-	630	-
Total	7,261	1,899	100.0

Source: Takoradi Port, Manifest/July 2000
Note: Mach/Equip includes electrical appliances, spare parts etc.
Building Mat. Includes bricks, tiles, glass.
Chemicals includes cement 543, detergent, plastics, etc.
Vehicle includes used cars, bycicle etc.

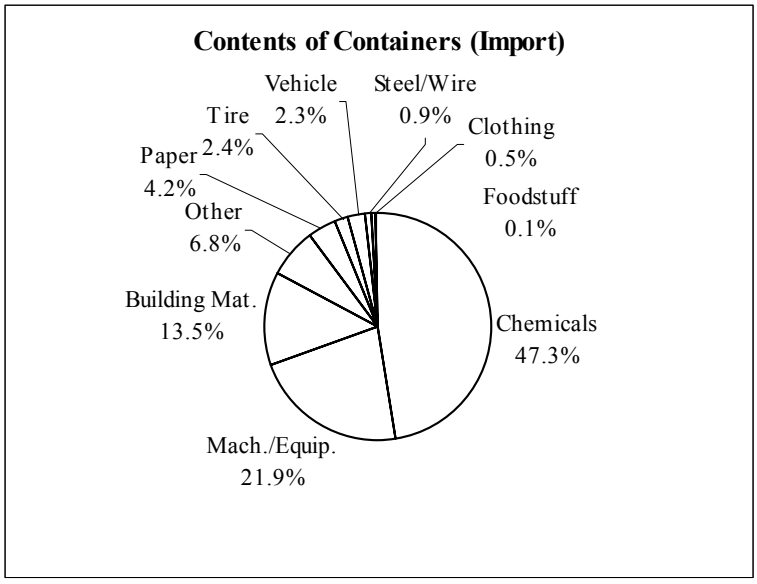

Figure 6.3.2.4 Contents of Containers (Import) – Takoradi Port

Table 6.3.2.5 Contents of Containers by Commodity
Takoradi Port - Export

Commodities	Cargo Volume (MT)	Boxes	Share (%)
Wood Products	17,286	1,641	70.7
Cocoa Beans	4,350	189	17.8
Cocoa Products	1,032	158	4.2
NTAP	791	27	3.2
Local Foodstuff	455	24	1.9
Sawn Timber	410	20	1.7
Other	130	11	0.5
Unidentified (loaded)	NA	468	NA
Empty	-	28	-
Total	24,454	2,070	100.0

Source: Takoradi Port, Manifest/July 2000
Note: NTAP includes yams, natural rubber.
Local foodsuff includes frozen fish.

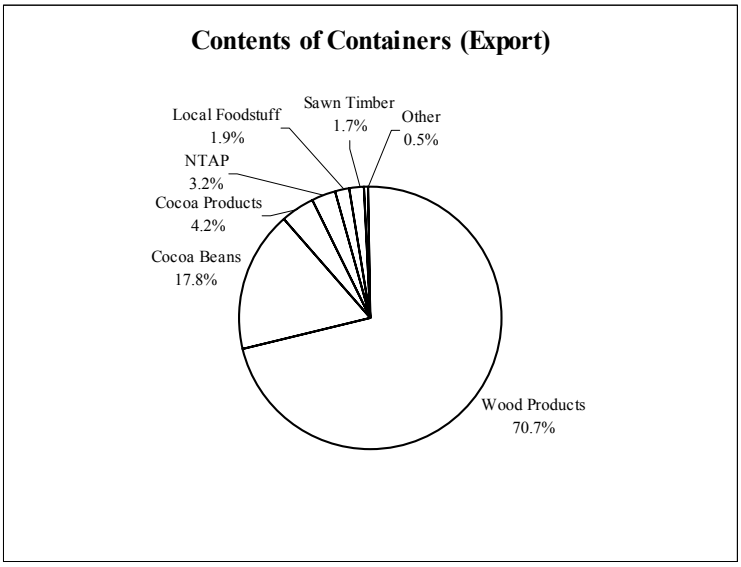

Figure 6.3.2.5 Contents of Containers (Export) – Takoradi Port

6.4 Navigation and Calling Vessels

6.4.1 Navigation

Pilotage is compulsory for all vessels except those exempted by the Harbour Master at Takoradi Port. As vessels approach the port, a pilot comes on board at a point 2.5 km northeast of the port entrance. After the pilot boards vessels go west and then turn by 90 degrees to enter the port. Vessels enter the port from the north and after entering turn by 90 degrees to berth. When vessels depart the port, vessels turn around at the turning basin between buoy 1 and buoy 4 and then leave the port. The pilot leaves vessels at a point 1 km north of the port entrance. Usually two tugboats are used for berthing and de-berthing. Vessels can enter and depart 24 hours a day.

The entrance channel is 185m wide and 11.3 m deep. The deepest berth is berth No. 6 with a depth of 9.5m and the deepest buoy is Buoy No.1 with a depth of 10.4m.

6.4.2 Calling Vessels

Table 6.4.1 shows the number of vessels calling at Takoradi Port in the last 10 years. About 500 vessels called at the port annually.

Table 6.4.1 Numner of Calling Ships by Type at Takoradi Port

SHIP TYPE		**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
GENERAL CARGO	GC	144	148	132	108	90	64	95	96	109	67
RO-RO	RO	46	47	57	89	67	98	109	116	133	104
CONT. MULTIP.	CM	31	22	17	26	41	52	60	67	51	60
CELL. CONTAINER	CO	20	35	75	66	88	99	84	90	83	103
BULKCARRIERS	BU	76	90	125	109	94	83	87	82	101	106
OTHER	OT	61	57	38	70	73	94	70	5	4	-
TANKER	TK	17	40	57	40	17	10	19	24	29	45
TOTAL		**395**	**439**	**501**	**508**	**470**	**500**	**524**	**480**	**510**	**485**

Source: GPHA

Vessel sizes are gradually increasing, especially RoRo vessels, despite the draft limitation (see table 6.4.2).

Table 6.4.2 Average NRT of Calling Vessels at Takoradi Port

SHIP TYPE		**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
GENERAL CARGO	GC	4,092	5,354	4,960	4,416	4,388	4,028				4,916
RO-RO	RO	4,655	5,315	5,424	6,822	8,379	7,841				10,191
CONT. MULTIP.	CM	5,490	6,025	5,863	5,028	7,008	6,393				6,692
CELL. CONTAINER	CO	5,772	6,324	5,485	7,233	7,588	7,363				7,223
BULKCARRIERS	BU	9,208	9,347	9,222	9,517	9,680	11,108				11,695
OTHER	OT	2,814	2,992	3,851	2,351	1,789	997				-
TANKER	TK	2,875	2,122	3,337	1,128	604	2,215				1,634

Source: GPHA

The distribution of vessel size at the port in 2000 is shown in Table 6.4.3. More than 50% of total vessels, or 287, vessels are estimated to have full drafts that exceed 9.5m.

Table 6.4.3 Distribution of Vessel Size at Takoradi Port

D.W.T	No. of Vessels	Standard Dimensions of Cargo Vessel by DWT			
		DWT	LOA (m)	Beam (m)	Draft (m)
More than 50,001	6				
40,001 - 50,000	40	40,000	200	29.9	11.8
30,001 - 40,000	39	30,000	185	27.5	11.0
18,001 - 30,000	202	18,000	161	23.6	9.6
12,001 - 18,000	93	12,000	144	21.0	8.6
Less than 12,000	225				
Total	506				

Source: Study team

6.5 Port Operation

The purpose of this subsection is to describe the present port activities and identify the present problems at Takoradi Port, as well as those that may arise when the port becomes a landlord port.

6.5.1 Outline of Port Operations

(1) Determination of cargo handling system

To determine which the cargo handling system to employ for each vessel calling at the port, a discussion is first held among the Port Operation Manager (POM), the Stevedoring Manager and the Cargo Handling Manager based on the documents, stowage plans, manifests, etc. which are submitted from shipping companies.

The cargo handling system is finally decided at the Berth Meeting. The Berth Meeting takes place once daily from Monday to Friday and is attended by POM who acts as a chairman, Harbor Master, Pilot, Shipping Agency, Customs, Immigration, Police, Shippers' Council, Stevedoring Company, Ministry of Agriculture, Timber of Commerce, Forest Product Inspection Division (FPID) and others.

(2) Documentation flow for import cargo and export cargo

i) Import

When a consignee takes his cargo from the vessel (or the cargo-holder), firstly the consignee exchanges his Bill of Lading (BL[1]) for the Delivery Order (DO[2]) of the shipping company, that handles the cargo, and then the consignee acquires his cargo by submitting the DO to the captain (or the cargo-holder). As for devanning from containers, the Devanning Report (or Unstuff Report) is compiled as record after both the consignee and the shipping company checks the condition of the consignment. The Laydays Statement (or Laytime Statement), which is the record of the vessel berthing time in order to handle the cargo, is compiled after the cargo handling is finished, and then the Statement is signed by the shipping company, the captain and the consignee. The Demurrage fee or Dispatch Money of the vessel is settled to account by the Statement.

Concerning imported cargoes, the captain of the vessel offers the Manifest (MF) to the customs of the discharging port or the police. The MF describes the commodity, volumes, shipping mark, cargo style, place of departure/arrival, consignee and so on. Importers must submit the Customs Invoice to the customs before the customs inspection is carried out. The Customs Invoice describes the commodity, numbers of units, volumes, unit price, total price, shipping mark, cargo style, place of departure/arrival, consignee and so on.

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1 *BL: It is securities, which the shipping company publishes to the consignor as the receipt of the cargo, when the exported cargo is loaded on board. It is also documentary evidence to the consignment. Formally, it is called that Shipping Bill of Lading; On Board Bill of Lading.*

2 *DO: It is a suggestion paper, in which the shipping company describes the suggestion to the cargo-holder (: Captain, Landing Agent, CY/CFS operator, etc.), when the cargo is handed over to the consignee at the arrival port. It is also the consent documents from shipping company to the consignee.*

ii) Export

The shipping company, which is entrusted by a consignor, delivers the Shipping Order (SO) to the consignor. After the consignor submits the SO to the responsibility of the vessel, the consignment is loaded on board. After that, the Chiefmate Officer who has the responsibility of loading work to the vessel, issues the Mate's Receipt (MR) which is the receipt of the cargo and hands the consignor the MR. And the consignor exchanges the MR with BL from the shipping company. In the case of container cargo, the consignor compiles the Dock Receipt (DR), which describes the commodity, volumes, loading/unloading ports, consignee, place of the cargo handed and arrival, etc. and makes a copy of DR. Then the consignor hands the DR to the container yard operator (the staff of the shipping company) for the requirement of shipping. After confirming the cargo on board, the container yard operator signs the copy of DR and returns it to the consignor. It becomes a formal receipt to the consignor. The DR with the signature is exchanged with the BL delivered by the shipping company.

(3) Condition of cargo handling equipment

There are no quay side crane in good condition for cargo handling at Takoradi Port, and ship gears are mainly used for cargo handling activities.

Approximately 7% of all handling equipment owned by GPHA at Takoradi Port requires repair and is not available for service (See Table 6.5.1). Among types of equipment, tractors appear to be in the worst state of disrepair as 30% of the total are not in service.

(4) Present Maintenance System

All preventive maintenance and most corrective maintenance of the equipment possessed by the port authority is carried out at the maintenance shop.

The number of workers in the shop is 50 persons. The shop is equipped with a lathe, shaping machine, milling machine, hack-sawing machine, drilling machines, bench grinding machines and so on.

(5) Working time

Normal working time of the GPHA staff except shift staff (the sections of shore handling, stevedoring, fire service, security office, medical office, and harbor master office) is from 8:00a.m. to 12:30p.m. and from 1:30p.m. to 5:00p.m. from Monday to Friday.

Normal working time for shift staff (except the staff of pilotage, tugs, line handling, and cargo handling) is from 6:00a.m. to 2:00p.m. for the first shift, from 2:00p.m. to 10:00p.m. for the second shift and from 10:00p.m. to 6:00a.m. for the third shift from Monday to Friday. As for the workers engaged in pilotage, tugs, line handling, and cargo handling, the normal working time for shift staff is shown in Table 6.5.2.

Table 6.5.1 Condition of Cargo Handling Equipment at Takoradi Port (August 2001)

No.	Items	Type	Location	Capacity (t)	Units	Code	Manufacture	Country Manufactured	Year manu-factured	Operational Condition*	Remark (Fund)
1	Quay side crane	Double link	Berth 4-5	15	2	1504-5	Metalna-IHI	Yugoslavia	1989		JBIC
2	Quay side crane	Jib crane	Log berth	15	3	1501-3	Metalna-IHI	Yugoslavia	1989		JBIC
3	Quay side crane	Jib crane	Cocoa	3	4	0301-4	Strother-Pitts		1953		Refurbish
4	Overhead crane		Log shed	3	10	0311-20	Rolling&Booth		1953		
5	Overhead crane		Log shed	3	10	0301-10	DEMAG	Germany	1989		JBIC
6	Mobile crane			90	1	9001	DEMAG	Germany	1988	A1	JBIC
7	Mobile crane			14	1	1401	DEMAG	Germany	1988	A1	JBIC
8	Log stacker truck			27	3	2701-3	Caterpilla	USA	1987	C3	IDA
9	Forklift truck	Top-lifter		42	2	4204-5	BOSS	UK	2001	A2	
10	Forklift truck	Top-lifter		42	2	4202-3	KALMAR	Sweden	1993	A1, B1	
11	Forklift truck	Top-lifter		42	3	4201	BOSS	UK	1990	A1	
12	Forklift truck	Top-lifter(RoRo container)		28	1	2803	KALMAR	Sweden	2001	A1	
13	Forklift truck	Top-lifter(RoRo container)		28	2	2802	KALMAR	Sweden	1996	B1	
14	Forklift truck	Top-lifter(RoRo container)		28	1	2801	KALMAR	Sweden	1993	B1	
15	Forklift truck	Standard		16	3	1601-3	KALMAR	Sweden	1993	A2,C1	
16	Forklift truck	Standard		15	1	1502	BOSS	UK	1988	B1	JBIC
17	Forklift truck	Standard		8	1	0803	LINDE	Germany	1993	A1	
18	Forklift truck	Standard		8	1	0802	BOSS	UK	1988	C1	JBIC
19	Forklift truck	Side-fork		5	3	0551-3	BOSS	UK	1997	A3	
20	Forklift truck	Standard		5	4	0520-3	BOSS	UK	1997	A2,B2	
21	Forklift truck	Standard		5	5	0515-9	LINDE	Germany	1994	A5	
22	Forklift truck	Standard		5	3	0512-4	LINDE	Germany	1993	A3	
23	Forklift truck	Standard		5	9	0503-11	BOSS	UK	1988	B8,C1	JBIC
24	Forklift truck	Standard		5	1	0502	BOSS	UK	1986	A1	JBIC
25	Forklift truck	Standard		5	1	0501	LINDE	Germany	1990	C1	
26	Forklift truck	Standard		4	1	0401	LINDE	Germany	1992	B1	
27	Forklift truck	Standard		3	3	0320-2	BOSS	UK	1997	A3	
28	Forklift truck	Standard		3	6	0314-19	LINDE	Germany	1994	A3,B3	
29	Forklift truck	Standard		3	3	0311-13	LINDE	Germany	1993	A3	
30	Forklift truck	Standard		3	3	0308-10	BOSS	UK	1988	A1,C2	JBIC
31	Forklift truck	Standard		3	2	0306-7	LINDE	Germany	1985	A2	
32	Tractor (TRA)	Rail shunting			2	9201-2	Rail Shunter		1988	A2	JBIC
33	Tractor (EME)	Back hoe			1	428				A1	
34	Tractor (RTR)				2	3501-2	KALMAR	Sweden	1995	A2	
35	Tractor (RTR)				4	2505-8	MAFI		1988	A2,B1,C1	JBIC
36	Tractor (RTR)				4	2501-4	MAFI		1988	A2,B2	JBIC
37	Trailer (RTR)	RoRo			6	5001-6	BUISCAI		1995	A6,B1	
38	Trailer (RTR)	RoRo			24	4001-24	MAFI		1988	A21,B3	JBIC
39	Trailer (RTR)	RoRo			2	3201-2				B1, A1	
40	Trailer (MRC)				1	3001				A1	

Source: GPHA

*Note) A: Available, B: Broken down, C: Removable & Scrapped

Table 6.5.2 Working Time for Shift Staff at Takoradi/Tema Port

Item	Shift	Working Time
Pilotage	1st	06:00-18:00
	2nd	18:00-06:00
Tugs	1st	06:00-18:00
	2nd	18:00-06:00
Line handling	1st	06:00-18:00
	2nd	18:00-06:00
Cargo handling	1st	07:30-19:30
	2nd	19:30-07:30
(Other shift working)	1st	06:00-14:00
	2nd	14:00-22:00
	3rd	22:00-06:00

Source: GPHA

The current time schedule of 1st shift and 2nd shift of cargo handling workers is shown in Table 6.5.3.

Table 6.5.3 Overtime Schedule of the Cargo Handling Staff

1st Shift	07:30 - 12:30 and 14:00 - 17:00 with overtime period 17:00 - 19:30
2nd Shift	19:30 - 03:30 with overtime period 03:30 - 07:30.

Source: GPHA

6.5.2 Cargo Handling System

(1) Container

In the case of Takoradi port, Full Container (CO), Semi Container (CM) and Ro-Ro (RO) type vessels transport more than 90% of the total container traffic in the port. In particular, Ro-Ro type (RO) vessels transport more than 50% of the total container traffic. The container volumes by ship type in detail are shown in Table 6.5.4.

Table 6.5.4 Container Volumes by Ship Types at Takoradi Port

Takoradi 1996	BU	CM	CO	GC	RO	OT	Total
Total TEU	313	3,702	6,297	534	11,841	230	22,917
Share %	1.40	16.20	27.50	2.30	51.70	1.00	100.00

Source: GPHA

The above mentioned vessels usually berth from No.2 to No.6 (depth: -8.0m to –9.6m) of the main wharf of Takoradi port.

Container handling (except on Ro-Ro vessels) from/to ship is carried out mostly by ship gear, and yard handling is done mainly by a combination of forklift trucks and trailers.

(2) Clinker

Clinker is imported as dry bulk cargo in Takoradi port. The cargo is handled by a private company, Ghana Cement Company Limited (GHACEM), and all required handling equipment belongs to the company.

The imported clinker is usually transported by means of lighterage in the port. The cargo is unloaded from ship to lighter by the ship gear using grab bucket at the No.1 buoy which is the deepest in the port (depth: -10.4m). Clinker lighters move to the clinker jetty which is located to the north of the main wharf of Takoradi port. Clinker is lifted up from the lighter to the belt conveyors, which are installed on the jetty, by the crane on the jetty by using grab bucket. Clinker on the belt conveyor moves to the company factory which is located in the industrial area of the port. At present, storage area for clinker provided in the port are is 80,000t and productivity of conveyor belt system for clinker is 700 t/hour.

(3) Bauxite

Bauxite is exported as dry bulk cargo from the port. The cargo is handled by a private company, Ghana Bauxite Company (GBC), and all equipment for handling is owned by the company.

The vessels for export of bauxite usually berth at the Bauxite Berth (depth: -9.3m) at first, and then shift to Buoy No.1 directly or via Berth No.6. When Buoy No.1 (depth: -10.3m) is available, vessels berth there from the beginning. The cargo is usually transported from land to the vessel by means of lighterage in the port.

The bauxite is coming from outside of the port by means of railway. The bauxite put on wagons is discharged with upsetting the wagons by the dumping machine. Then the cargo carried on the belt conveyor is transported to the Clinker jetty and loaded to lighter by ship loader which is installed on the jetty. The cargoes in the lighter are transported to the ship and loaded to ship by ship gears.

At the present, storage capacity of bauxite provided in the port area is 400,000t and productivity of conveyor belt for bauxite are 300-400 t/hour using a single belt, improvement of the conveyor belt is under implementation (the improved efficiency will be 400-500 t/hour) by GBC. At the storage area, the Tippler system is utilized for discharging bauxite from wagons. From bauxite mine to the berth, bauxite is carried by 4 trains with 120 wagons（1 wagon = 40t, 40t x 120 wagons = 4,800t）in a day. Tippler system can discharge bauxite from a wagon in 4-5 minutes. Tippler's efficiency is calculated as about 400 t/hour. Ghana Bauxite Company（GBC）has an improvement plan for the Tippler system which it intends to implement soon.

(4) Manganese

Manganese is exported as dry bulk cargo from the port. The cargo is handled by a private company,

Ghana Manganese Company Limited (GMC), and the equipment is possessed by the company.

The vessels for export of manganese usually berth at the No.1 berth (depth: -8.5m) of the main wharf, and then shift to Buoy No.1 directly or indirectly through Berth No.6 or the Bauxite Berth. Manganese is transported from land to the vessel at Buoy No.1 by means of lighterage.

The manganese is transported from the manganese mine to the port by means of railway. The distance is 63 km. The manganese in railway wagons is discharged to storage yard with upsetting the wagons by the dumping machine. The piled cargoes at the yard are handled by pay loader and placed on the belt conveyor. The cargoes on the belt conveyor are loaded to the vessel at Berth No.1 by loaders which are installed on the berth.

At the manganese storage area, the Tippler system is used for discharging manganese from wagons. From manganese mine to the berth, manganese is carried by 4 trains with 120 wagons (1 wagon = 25t, 25t x 120 wagons = 3,000t) in a day. Tippler system can discharge manganese from wagon in 5 minutes. Tippler's efficiency is calculated as 300 t/hour and will be able to support the conveyor belt system. At the berth side, conveyor belt system for manganese can load 6,000 t/day (about 300 t/hour) to vessels by a single belt. For direct loading to vessels, improvement works for conveyor belt system is under implementation (conveyor belt will be raised to a suitable height for larger vessels) by GMC.

(5) Sawn Timber

Sawn Timber is exported mainly as general cargo (by Ro-Ro) or containerized cargo from the port. The exported cargo is controlled by the Timber Export Development Board (TEDB).

The vessels for export of sawn timber usually berth from Berth Nos.2 to No.6 (depth: -8.0m to -9.6m) of the main wharf. Occasionally, cargoes are transported from land to the vessel by means of lighterage in the port.

The sawn timber is transported from outside to the port mainly by trucks or in a few cases by rail wagons. The cargo is usually handled by the combination of the forklift truck and trailers in the yard and apron. Otherwise the overhead crane might handle some of the timber to which the nail of the forklift truck can not be inserted.

(6) Cocoa

All cocoa is already bagged at the production site. Then many of the bags are stuffed into containers in the port. In 1999, 65% of cocoa beans was exported as containerized cargo. UNI CONTROL of private sector exports the cocoa beans as grain bulk. All the exported cocoa is controlled under the Ghana Cocoa Board (COCOBOD) of the public sector.

All the cocoa beans are transported by means of trucks or rail wagons. The cocoa is taken in and piled in the shed manually or sometime belt conveyors are used. Fumigation by powder method is carried out in the shed for seven days.

After fumigation, the bags are stuffed in containers in front of the shed and moved to the quay side directly (not to the container yard) and loaded to ship by ships gear. Alternatively, bags are loaded on the trailer in front of the shed and moved to quay side and loaded to ship by ships gear.

In the case of UNI CONTROL, the bulk cocoa is moved from the front of their own shed (where is Berth No.2 to No.3 are located) to the vessel by belt conveyers directly.

All vessels, regardless of whether they transport cocoa as container cargo or as bulk, usually berth from Berth No.2 to No.6 of the main wharf

(7) Wheat and Feedstuff (Pellet)

Wheat and feedstuff (pellet) as dry bulk cargo are handled by TAKORADI FLOUR MILL. The discharging of wheat is handled by hoppers, ship gear and grab bucket at a productivity of 2,500 t/day and the loading of pellet is handled by ship gear at a productivity of 700 t/day. Average handling period of wheat is 5-6 days for discharging (14,000 t/vessel) at berths 2-6.

(8) Quick Lime

Quick lime is imported by CARMEUSE. The discharging of Quick lime is handled by hoppers and ship gear with grabs (3.2 m^3 and 8 m^3) with a productivity of 5,000-6,000 t/day. Average handling period is 1-2.5 days for discharging (7,000-15,000 t/vessel) at berth 6 and 4.

6.5.3 Cargo Handling Productivity

According to container handling data of GPHA from January to December 2000, the target and actual labor productivity of container handling is 28TEUs/ gross gang hour and 10TEUs/ gross gang hour to CO, 20TEUs/ gross gang hour and 6TEUs/ gross gang hour to CM, and 10TEUs/ gross gang hour and 18TEUs/ gross gang hour respectively to Ro. Target is achieved only in the case of RO. Detailed labour productivity of container handling at Takoradi port is shown in Table 6.5.5. Labour productivity of cargo handling excluding container is shown in Table 6.5.6.

In terms of the berthing time per ship, the container handling productivity, which is calculated to being based on the GPHA's data in 2000, results in around 12TEU/gross berthing hour/ship to CO. The figure corresponds to the labour productivity in the case of the vessels using two ship cranes (in other word, two gangs working to the one ship) at the same time. Detailed cargo handling productivity by commodity in Takoradi port is shown in Table 6.5.7.

6.5.4 Customs Inspection

In the case of Takoradi and Tema port, most imported containers are opened at the container yard for customs inspection. Most of the time that imported cargoes spend in the port area is a result of customs inspection.

Customs inspection in Ghana sea ports is described in detail in subsection 7.5.4 (port operation related to Tema).

Table 6.5.5 Labor Productivity to Container Handling of GPHA User Area of Port of Takoradi (January~December 2000)

Productivity type	Vessel type	Unit of measure	Target	Actual
Labor productivity of discharging	Full container (CO)	box/gross gang hour	28	8
		TEU/gross gang hour	28	10
	Semi Container (CM)	box/gross gang hour	20	6
		TEU/gross gang hour	20	6
	Ro-Ro (RO)	box/gross gang hour	10	14
		TEU/gross gang hour	10	18
Labor productivity of loading	Full container (CO)	box/gross gang hour	28	8
		TEU/gross gang hour	28	10
	Semi Container (CM)	box/gross gang hour	20	4
		TEU/gross gang hour	20	5
	Ro-Ro (RO)	box/gross gang hour	10	15
		TEU/gross gang hour	10	20

Source: GPHA

Table 6.5.6 Labor Productivity of GPHA User Area of Port of Takoradi (Except Container) (January~December 2000)

Productivity type	Commodity	Unit of measure	Target	Actual
Labor productivity of discharging	General cargo	tons/gross gang hour	15	22.57
	Bagged cargo	tons/gross gang hour	25	19.34
	Unit/Pallet cargo	tons/gross gang hour	20	29.48
	Iron/Steel cargo	tons/gross gang hour	30	26.25
Labor productivity of loading	General cargo	tons/gross gang hour	10	30.96
	Bagged cargo	tons/gross gang hour	20	15.43
	Unit/Pallet cargo	tons/gross gang hour	20	22.18
	Iron/Steel cargo	tons/gross gang hour	15	-

Source: GPHA

Table 6.5.7 Cargo Handling Productivity per ship in Takoradi Port in 2000

Productivity type	Commodity	Unit of measure	Actual
Cargo Handling Productivity of loading/discharging	Container (CO)	TEU/berthing hour/ship	12
		box/berthing hour/ship	9
		tons/berthing hour/ship	108
loading/discharging	Ro-Ro cargo (RO)	tons/berthing hour/ship	68
loading	Cocoa beans (BC)	tons/berthing hour/ship	30
loading	Sawn timber (GC)	tons/berthing hour/ship	33
discharging	Clinker (DB)	tons/berthing hour/ship	269
loading	Bauxite (DB)	tons/berthing hour/ship	194
loading	Manganese (DB)	tons/berthing hour/ship	165
discharging	Wheat (DB)	tons/berthing hour/ship	93
loading	Cocoa beans (DB)	tons/berthing hour/ship	67

Source: JICA calculation based on GPHA's data

6.6 Engineering and Construction Aspects

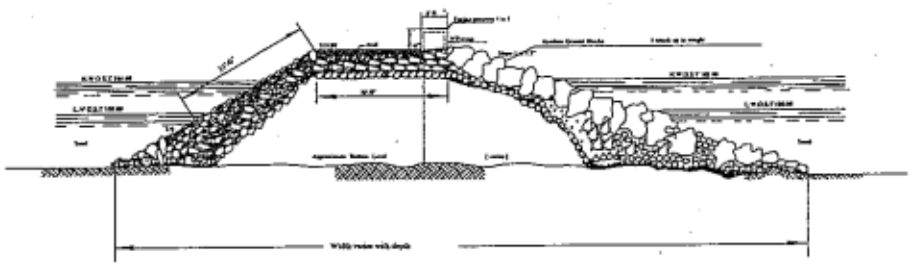
6.6.1 Engineering

(1) Structural Design of Port Main Facilities

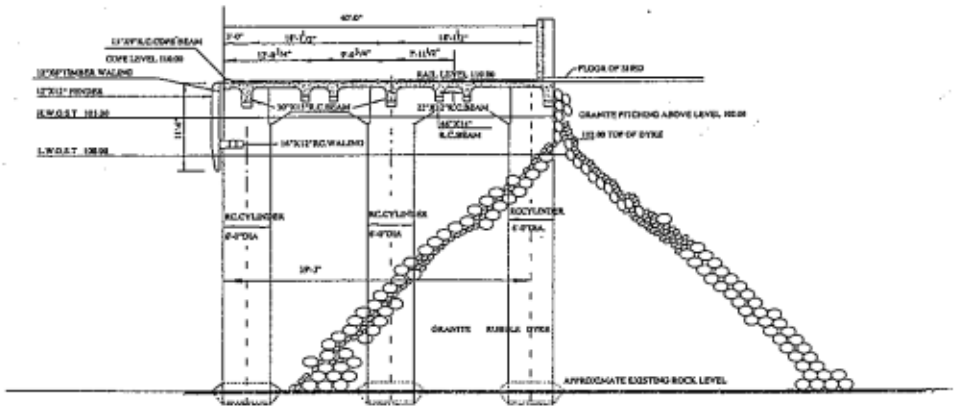
The structural design of the port main facilities are summarized in Table 6.6.1, and typical sections of the port main facilities are shown in Figure 6.6.1.

Table 6.6.1 Structural Design of Port Main Facilities (Takoradi Port)

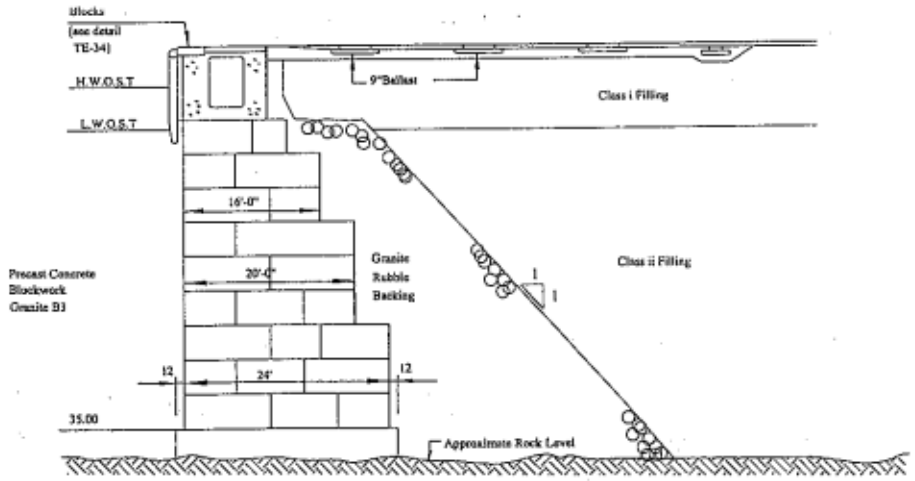
LOCATION	FACILITIES	DIMENSION	STRUCTURAL TYPE	YEAR OF CONSTRUCTION
Breakwaters				
	Main Breakwater	L=2,360m	Rubble mound	~1928
	Lee Breakwater	L=1,830m	Rubble mound	~1928
Inner Harbour				
Main Wharf				
	Berth No. 1	159m, -8.5m	Open type	~1953
	Berth No. 2	168m, -7.9m	Open type	~1953
	Berth No. 3	152m, -7.9m	Open type	~1953
	Berth No. 4	182m, -8.5m	Concrete block	~1958
	Berth No. 5	82m, -8.5m	Concrete block	~1958
	Berth No. 6	152m, -8.9m	Concrete block	~1958
Buoy Mooring				
	Buoy No.1	195m, -10.36m	Mooring Buoy	~1958
	Buoy No.3	193m, -9.3m	Mooring Buoy	~1958
	Buoy No.4	181m, -8.4m	Mooring Buoy	~1958
	Buoy No.5	176m, -7.7m	Mooring Buoy	~1958
	Buoy No.6	174m, -7.5m	Mooring Buoy	~1958
	Buoy No.7	150m, -7.0m	Mooring Buoy	~1958
	Buoy No.8	91m, -6.0m	Mooring Buoy	~1958
	Buoy No.9	96m, -5.5m	Mooring Buoy	~1958
Lighter Wharves, Docks and Marine Yard				
	North Lighter wharf	80m, -3m	Open type	~1953
	West Lighter wharf	340m, -2m	Open type	~1953
	North Log Quay	220m, -1.5m	Open type	~1953
Outer Harbour				
	Oil Berth	183m, -8.8m	Concrete pier	~1928
	Bauxite Berth	154m, -9.1m	Concrete pier	~1956
	Clinker Jetty	220m, -7.4m	Concrete pier	~1969



Main Breakwater



Berth No2 & No3



Berth No4 ～ No6

Figure 6.6.1 Typical Sections of Port Main Facilities

(a) Breakwaters

Two breakwaters forming the inner harbour of Takoradi Port were constructed by 1928 with the lengths approximately 2300m (Main breakwater) and 1800m (Lee breakwater) respectively. The structural design of the breakwaters is both rubble mound type with 5ton(min.) rock armoring on seawards side slope. The slopes of breakwaters are at 1:2 for seaward side and 1:1.5 for lee side. The crest height of the breakwaters is constructed at 3.5m above Chart Datum and the deepest water depth around round heads is about –11m. The crest width of the main breakwater is 9.1m including seaward side concrete parapet, and 6.5m of the width is surfaced with bituminous gravel for roadway.

The main breakwater has been maintained since its completion with periodical repairs on slopes damaged by wave action and overtopping. The recent major repair of main breakwater took place during the rehabilitation project implemented in 1986-1995.

(b) Mooring Facilities of Inner Harbour

The mooring facilities of Inner Harbour consist of Main wharf, North lighter wharf, West lighter wharf, North log quay, Dock and Marine yard area, and Buoy mooring area.

The main wharf is located along the south side of the lee breakwater with total length of approxi. 860m and width of about 70m throughout. Total six (6) berths, Berth No. 1 to No. 6, are allocated to this wharf and nominal water depth is ranged from –8.5m to –9.5m. The berths No. 1~3 are designed with a pile supported (R.C cylinder, dia.1.8m) open wharf type, whilst berths No. 4~6 are designed with a concrete block type structure which have been constructed under Port Expansion Project (1952-1956).

The north lighter wharf, having its length about 270m were constructed by 1929 and since then no major repair or rehabilitation has taken place notwithstanding its serious structural deterioration has been reported in previous studies. Contrary to this the west lighter wharf has been reconstructed in the Port Expansion Project. The structural design of the north & west lighter wharves are both a type of pile supported (stamp piles 14”x14”) open wharf.

The Structural type of the north log quay is similar to the lighter wharves however no major repair has been recorded.

Two (2) docks namely Dock No.1 (150m long, 30m wide) & No.2 (120m long, 18m wide) and Marine yard having a slipway (180m long, 15m wide) and a small dock (lighter dock) being used for mainly ship maintenance/repair works due to the shallowness of the front water area, are mostly constructed with a reinforced concrete wall type structure and a significant repair/rehabilitation work of the slipway and the lighter dock took place in1990.

(c) Outer Harbour Facilities

In outer harbour a Oil Berth and a Clinker Jetty are provided and operated by private companies. Originally a bauxite berth was also constructed and used for bauxite loading, however the loading

facilities has been shifted to the clinker jetty since 1990.

The oil berth located at seaward side of the lee breakwater (behind Berth No.4) are constructed with R.C piers and a steel deck structure. The berth is connected to Main wharf area with 2 steel-made bridges.

The clinker jetty projected from Industrial Area were originally constructed by 1969 however has been renovated in the Rehabilitation Project. At present the jetty is about 220m long and constructed with a piled pier type structure.

(d) On-land Facilities

Sheds: Most of the sheds were constructed under the Port Expansion Project (1952-1956). During the Rehabilitation Project (Phase 1, 1986-1990) however, a several modification and renovation works were carried out such as removal of Transit shed No.6, renovation of the timber sheds No.1&2 and so on. After the Rehabilitation Project a new cocoa shed were constructed in 1999 replacing the previous transit sheds No.2 and 3.

Yards and paving: Most of the paving works in the port area were renovated in the Rehabilitation Project and precast concrete blocks are used for the paved yards including port roads and wharf aprons.
A new concrete blocks paving work for container platform behind the Industrial area is at present underway and will be completed before the end of February, 2001.

(2) Structural Conditions of The Port Main Facilities

The current structural conditions of the port main facilities are indicated in Table 6.6.2.

Table 6.6.2 Structural Conditions of Port Main Facilities

Facilities	Structural Type	Present Conditions	Remarks
1. Breakwaters -Main Breakwater -Lee Breakwater	 Rubble Mound Rubble Mound	Regular repair is required to maintain the both breakwaters. The lee side of the main breakwater, at several locations, are damaged and become steeper than originally designed. The lee breakwater is suffered from scoring and requires a periodical filling at the deeper area. Although the breakwaters are functioning well it is necessary to restore/ improve both structures from long term view point.	Major repair work on the breakwaters took place during the rehabilitation project period. Armor rock sizes be examined.
2. Mooring Facilities (Inner Harbour) -Main Wharf	 BerthNo.1-3 (Stamp piled open wharf) BerthNo.4-6 (Concrete block)	Berths 2&3 were reconstructed during the rehabilitation project period (1986-1995), whilst berths No.4~6 were constructed under the port expansion project (1952-1956). Those berths are currently in good condition though some minor damages (cracks and chipping) are seen at several locations.	Berth No. 1 (manganese berth) is seen with some deterioration thus need to be examined for a long term use.
-N. Lighter Wharf -W. Lighter Wharf -N. Log Quay -Docks/ Marine Yard	Open wharf Open wharf Open wharf Concrete	N. Lighter wharf is seriously deteriorated and dangerous conditions thus not used at present except the west end portion where used only for small port services boats. To use this wharf a reconstruction is needed. The west lighter wharf and the north log quay are not so seriously deteriorated but too shallow to use for loading cargoes.	
(Outer Harbour) -Oil Berth -Clinker Jetty	 R.C Pier & bridge Open wharf	Oil berth is well maintained and in good condition. Some deterioration is observed at several locations of Clinker jetty	Operated by private companies.
3. On-land Facilities -Sheds	 All steel frame work except a copra shed and other small sheds.	Mostly old construction however well maintained.	
-Yard and Paving	Concrete block paving	Well maintained and generally in good conditions.	

6.6.2 Construction Materials and Equipment

(1) Construction Materials

In Ghana locally available construction materials are generally limited to those such as cement, asphalt, timbers, aggregates, sand and stone materials. No steel material is locally available except for mild steel rods and the related products that can be used as reinforcement for R.C. structures. The steel rod with a several sizes are manufactured by WAHOME, TEMA STEEL WORKS and FERRO FABRIC. The material tests conducted by Civil Engineering Department of KNUST give the results as;

- the yield strength of these local bars range between 330 and 400 N/mm2 and the ultimate strength between 400 and 650 N/mm^2.

- the percentage of elongation ranges from 7 to 12.5 (smaller than BS requirement of min. 22%).

Around Takoradi area a few asphalt plants are operated and commercially available, however no commercially operated concrete plant exists. Concrete products such as concrete blocks for wall, kerb and paving woks, or concrete pipes are many available however mostly in use of road and building works.

Rock materials for use as armor rock, road chippings and for structural concrete works may be obtained from quarries exploiting a massive outcrop of granitic gneiss at Essipojn. Haulage distances are of the order of 10 km on the average. The existing quarries in the vicinity of Takoradi are indicated in Table 6.6.3.

Table 6.6.3 Quarries in the Vicinity of Takoradi

Name	Location	Distance from Takoradi	Product Sizes	Production Rate	Quality	Remarks
GDC	Essipon	10 km	All sizes	N.A	Suitable for armour rock, base/ subbase and aggregate	
SICOL	Essipon	10 km	All sizes	N.A	Ditto	
SCC	Essipon	10 km	All sizes	N.A	Ditto	Quarry is functional but not operated at present

(2) Construction Equipment

Construction equipment for onshore works (mostly road and buildings works) are locally available however, no floating construction equipment for marine works other than small barges, anchor handling barges or tug boats is available locally. And the most of contractor have no experience of marine construction.

6.6.3 Construction Cost

(1) Unit Prices of Workers, Construction Materials and Equipment

Unit prices of locally available workers, construction materials and equipment are shown in Tables 6.6.4, 6.6.5 and 6.6.6 respectively. The unit prices indicated in those tables are based on;

- the lowest or average of lower prices obtained from various sources
- 1USD= 6,700 Cedis

The prices of gasoline, diesel oil, water supply and electricity are currently controlled by the Government thus no difference between Tema and Takoradi areas. Only a few materials like mild steel rods and related products are slightly higher in Takoradi than Tema as transportation cost from the production site is added.

The workers wages indicated in Table 6.6.4 are taken from the Agreement between the Association of Building and Civil Contractors of Ghana (ABCCD) and the Construction & Building Materials Workers Union (C&BMWU) as the basic wages for year 2001.

(2) Construction Cost

At present no marine work is being undertaken in and around the Takoradi Port, thus no fresh data on marine construction works is available. Instead, a paving work of the container platform area is currently being carried out in the Port. According to the contract of the work the unit construction cost for the yard paving by concrete paving blocks is in the order of 150,000 cedies/m^2 (USD.22.3/m^2).

Table 6.6.4 Construction Workers Wage (Base Wage)

Classification	Unit	Cedi	USD	Remarks
Foreman	per day	12,850	1.92	
Technician	per day	12,250	1.83	Grade1
Electrician	per day	12,250	1.83	
Operator, heavy	per day	11,600	1.73	Grade2
Driver, dump truck	per day	10,100	1.51	
Driver, ordinary	per day	10,400	1.55	
Carpenter	per day	11,600	1.73	
Form worker	per day	11,600	1.73	Grade2
Mason	per day	11,600	1.73	Grade2
Plumber	per day	11,600	1.73	Grade2
Painter	per day	11,600	1.73	Grade2
Welder	per day	11,600	1.73	Grade2
Skilled worker	per day	10,100	1.51	
Seme-skilled worker	per day	9,750	1.46	
Common labor	per day	9,450	1.41	

Table 6.6.5 Unit Costs of Construction Materials

	Unit	Cedi	USD	Remarks
Gasoline	liter	1420	0.21	
Diesel Oil	liter	1325	0.2	
Electricity	kwh	85	-	
Asphalt(MC2)	ton	2,000,000	298.5	
Asphalt(S125)	ton	1,800,000	268.7	
Sand(Quarry sand)	m^3	22,000	3.2	
Sand	m^3	27,000	4.0	
Gravel (Natural)	m^3	33,300	4.9	
Coarse aggregate	m^3	62,600	9.3	
Crushed stone for subbase	m^3	41,000	6.1	
Crushed stone for base course	m^3	45,000	6.7	
Rubble stone(50kg-500kg)	m^3	50,000	7.5	
Rubble Stone(1,000kg)	m^3	60,000	9.0	
Portland cement	ton	500,000	74.6	
Ready-mixed concrete	m^3	-	-	Not available
Reinforcing bar (Mild steel rod)	ton	2,800,000	417.9	
Welded wire mesh	ton	100,000	14.9	
Timber,plank	m^3	900,000	134.3	
Timber,square	m^3	900,000	134.3	
Plywood (12.5mmTHK)	m^3	24,000	3.6	

Table 6.6.6 Costs of Construction Equipment

Equipment	Capacity	Cedi/day	USD/day	Remarks
Bulldozer	21 ton	3,500,000	522.4	
Backhoe	0.7m^3	3,500,000	522.4	
Trailer truck	20 ton	2,500,000	373.1	
Payloader	125 HP	2,000,000	298.5	
Excavator	0.6m^3	3,500,000	522.4	
Macadam roller	10-15 ton	1,600,000	238.8	
Tire roller	8-15 ton	1,600,000	238.8	
Motor grader	3.7m	700,000	1044.8	
Vibro-roller	1 ton	2,000,000	298.5	
Truck	6 ton	2,000,000	298.5	
Truck	11 ton	2,600,000	388.1	
Dump truck	11 ton	2,600,000	388.1	
Tire-mounted crane	30 ton	9,600,000	1432.8	
Asphalt distributor	1-1.5m	2,600,000	388.1	
Asphalt finisher	1.6-3.0m	2,600,000	388.1	
Concrete finisher	3-4.5m	-	-	
Concrete mixer	0.5m^3	300,000	44.8	
Microbus	15 persons	300,000	44.8	
Off-road car	2,500cc	450,000	67.2	
Light vehicle		270,000	40.3	
Diesel generator	250KVA	250,000	37.3	
Compressor	2.0m^3/min	200,000	29.9	

Note: Fuel cost not included.

6.7 Bottlenecks of Takoradi Port

6.7.1 Shortage/Lack of Deep Berths

- Insufficient draft of berths prevents vessels from calling Takoradi Port with full draft.
- Shortage of deep berths forces vessels to wait a long time for berthing and/or to shift to shallow berths when vessels' drafts are less.

Table 6.7.1 Distribution of Vessel Size at Takoradi Port

D.W.T	No. of Vessels	Standard Dimensions of Cargo Vessel by DWT			
		DWT	LOA (m)	Beam (m)	Draft (m)
More than 50,001	6				
40,001 - 50,000	40	40,000	200	29.9	11.8
30,001 - 40,000	39	30,000	185	27.5	11.0
18,001 - 30,000	202	18,000	161	23.6	9.6
12,001 - 18,000	93	12,000	144	21.0	8.6
Less than 12,000	225				
Total	506				

Source: Study team

According to vessel calling data of Takoradi Port in 2000, 55 vessels shifted berths one or two times. Most of them were bulk carriers which carried manganese, bauxite and clinker. Typical shift of berths are from Manganese Berth to Buoy No.1 for loading of manganese, from Bauxite Berth to Buoy No.1 for loading of bauxite and from Buoy No.1 to Wharf No.6 or Bauxite Berth for unloading of clinker. Average turnaround days of these vessels were 6.6 days (159 hours).

- Double handling of cargoes

As the deepest berthing facility is Buoy No.1, many vessels use it. When the buoy is used, loading and unloading are carried out by using barges. This means that in order to load or unload cargoes to/from vessels, cargo operations are done twice. Cargo must be transported between berths and barges and then again between barges and vessels. In 2000, 74 vessels used Buoy No.1 and most of them were bulk carriers which carried clinker, manganese and bauxite.

6.7.2 Space Restriction

- Narrow apron and limited space for cargo handling hamper efficient cargo handling.
- Shortage of container yard and segmentation of them hampers efficient operation
- Shortage of parking space for trucks and number of gates and insufficient gate operation causes long queue of trucks and make the port area more congested.
- Shortage of stock yards for bulk cargo such as manganese and other potential cargoes.
- As access roads to the port are very steep, heavy haulage vehicles sometimes get stalled. A new access road which has a gentler slope and detours the city center would have to be considered.

6.7.3 Low Productivity of Cargo Handling

- Shortage of workable cargo handling equipment is one of main reasons for the low productivity.
- Because of Lack of shore cranes cargo handling productivity is limited to the permissible limits of ship gears, some of which are very slow.
- Direct loading/unloading between vessels and trucks is another reason of low productivity for break-bulk cargo.
- Customs physical inspection in the port area delays cargo movement and requests for strict and detailed documentation prolong the documentation clearance procedure.
- Lack of yard planning and inventory control of containers in container yards is a factor in the low productivity of yard operation.

Table 6.7.2 shows the gross productivity of cargo handling by commodity at Takoradi Port in 2000. These figures mean the average productivity which is calculated by discharged and loaded cargo volume divided by berthing hours. As for Bauxite, Clinker and Manganese, berthing hours include shift time between berths/buoys.

Table 6.7.2 Gross Cargo Handling Productivity at Takoradi Port in 2000

Commodity	L/D	Type	Productivity	Unit	Remark
Cocoa Beans	L	BC	29.7	t/hour/vessel	
Cont	L/D	CO	107.9	t/hour/vessel	CO Vessel
Cont (Boxes)	L/D	CO	9.3	box/hour/vessel	CO Vessel
Cont (TEUs)	L/D	CO	12.0	TEU/hour/vessel	CO Vessel
Bauxite	L	DB	193.6	t/hour/vessel	
Clinker	D	DB	269.4	t/hour/vessel	
Cocoa Beans	L	DB	66.9	t/hour/vessel	
Manganese	L	DB	164.9	t/hour/vessel	
Wheat	D	DB	92.5	t/hour/vessel	
S/Timber	L	GC	32.7	t/hour/vessel	
Petroleum	D	LB	82.0	t/hour/vessel	
RoRo Cargo	L/D	RO	68.1	t/hour/vessel	

Source: Study team

6.7.4 Imbalance of Containerized Cargo

- Imbalance of volume of containerized cargo between import and export causes additional transportation cost.

Number of full containers for import is much less than that of export, that is one fifth of export container. Shipping companies don't want to use ports where the imbalance of containerized cargo between import and export is high because they have to carry many empty containers, which earn no money.

6.7.5 Institutional Matters

- Lack of practical competition on port operation and vague responsibility demarcation system between the port authority and port users make the responsibility for cargo handling ambiguous and weakens initiative of the both sides to improve operation.
- Transit to an autonomous landlord port.

The landlord Bill will soon be submitted to the Parliament and upon passage of the bill Takoradi Port will become an autonomous landlord port. Then the port will have to have a financially self-supporting system and will have to compete with not only foreign ports but also Tema Port, although financial conditions of the port are not satisfactory as explained in chapter 8. The problems occurred in the transition of the nature of the port would have to be studied and countermeasures should be taken, if necessary.