9 LONG-TERM INFRASTRUCTURE DEVELOPMENT PLANS OF THE STUDY PORTS

9.1 Socioeconomic Characteristics of the Regions of the Study Ports

- Governorate of Muscat

Governorate of Muscat, where Sultan Qaboos Port resides, is situated on the Gulf of Oman at the south part of the Al Batinah coast. The total population of the Governorate amounts to 549,000 inhabitants according to the 1993 Census. The Governorate is the most populous area of the Sultanate. The population density here exceeds 24 times the average population density in the Sultanate.

- Governorate of Dhofar

Governorate of Dhofar, where Salalah Port resides, is situated in the far south of the Sultanate. It joins Al Wusta Region from the east and the borders of the Sultanate with the Republic of Yemen from the south west. The total population of the Governorate is about 189,000 according to the 1993 census.

- Al Batinah Region

Al Batinah Region, where Sohar Port and Shinas Port are located, is known as Al Batinah coast, as it occupies a vital geographical location on the coast of the Gulf of Oman. The width of the coastal plain is about 25 km. Al Batinah Region is one of the most highly populated regions of Oman as its population stood at 565,000 inhabitants according to the 1993 Census.

- Governorate of Musandam

Governorate of Musandam, where Khasab Port resides, lies in the extreme north of the Sultanate. It is separated from the rest of the Sultanate by a strip of UAE land. Its rough mountains rise to 1800 meters above sea level. The total population is about 28,000 according to 1993 Census.

- Al Wusta Region

Al Wusta Region, where Duqm Port is planned, is situated to the south of both Ad Dakhliyah and Adh Dhahairah Regions. It includes a large area of the central parts of the Sultanate. It is distinguished for having a great number of oil wells. Its population is approximately 17,000 inhabitants according to the 1993 Census. It consists of four wilayats.

Table 9.1-1 Estimated GRDP by Region in 2000 (at Current Prices, RO million)

Economic Activity		Muscat	Batinah	Musandam	Dhahirah	Dakhliyah	Sharqiyah	Wusta	Dhofar	Total
1	Total Petroleum Activities	3,718								
2	Total Non Petroleum Activities	2,153	676	35	219	223	416	16	343	4,079
2.1	Agriculture & Fishing	14	70	5	13	7	20	7	14	149
2.2	Industry Activities	302	68	3	41	28	161	2	49	655
	C. Mining & Quarrying	7	1	-	6	1	2	-	1	18
	D. Manufacturing	206	36	0	14	10	136	-	13	415
	E.Electricity & Water Supply	26	20	3	6	6	6	1	10	78
	F. Building & Contruction	64	11	0	15	11	18	0	25	145
2.3	Services Activities	1,836	538	27	165	188	234	7	280	3,275
GRDP at Market Prices		5,713	676	35	219	223	416	16	343	7,639
	Total Population	549	645,800	28,600	199,100	260,600	296,700	20,000	217,600	2,316,570
	GRDP per Capita (RO)	8,813	1,046	1,224	1,099	856	1,400	790	1,575	3,298
Area (km2)		3,900	12,500	1,800	44,000	31,900	36,400	79,700	99,300	309,500

Source: JICA Road Study Team Estimates

9.2 Alternative Development Plan

9.2.1 Sultan Qaboos Port

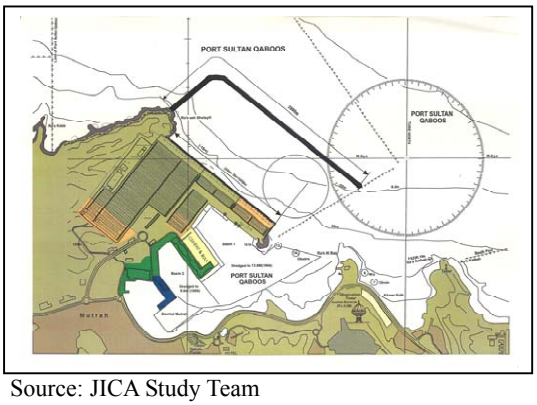
Cargo demand of the national gateway port for 2025 is estimated at 900,000 TEUs and 3.4 million tons of conventional cargos while existing capacity of Sultan Qaboos Port is estimated at about 300,000 TEUs. Expansion of container handling capacity at Sultan Qaboos Port is proposed and development of a New Port is also suggested to accommodate overflowing conventional cargos.

Planning policies for Sultan Qaboos Port are set as follows;

- Improve the national gateway function, especially for container handling
- Promote economic diversification through development of tourist oriented facilities
- Coordinate planning with both national and regional plans

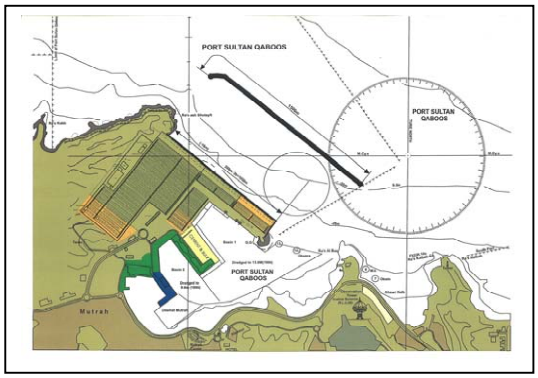
Two alternative facility layout plans are shown in Figure 9.2-1 and Figure 9.2-2. Both layout plans provide a 1,050 linear meter quay wall to handle containers in front of the present Shutaify Bay storage area. The difference between the two is length and configuration of the breakwater.

Figure 9.2-1 Sultan Qaboos Alternative A



Source: JICA Study Team

Figure 9.2-2 Sultan Qaboos Alternative B



Source: JICA Study Team

9.2.2 Salalah Port

Cargo demand of Salalah Port for 2025 is estimated at 6.6 million TEUs and 3.3 million tons of conventional cargos while existing port capacity is estimated at about 2 million TEUs and about 2 million tons, respectively. Behind the port area, a Free Trade Zone has been developing to activate regional economies, and development of berthing facilities for cruise vessels has been proposed.

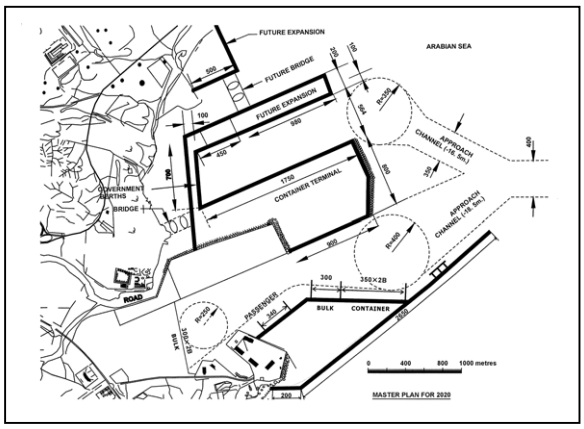
Planning policies for Salalah Port are set as follows;

- Maintain and strengthen international container hub function
- Promote and support tourism development
- Expand bulk cargo handling function

Two alternative plans are shown in Figure 9.2-3 and Figure 9.2-4. Differences between the two are locations of bulk terminal and container terminal. In Alternative A, an additional bulk berth and container berths are located at the reclaimed area. On the other hand, in Alternative B, existing bulk

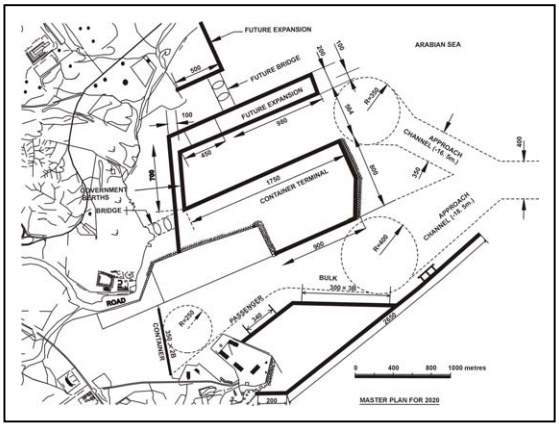
berths No.30 and No.31 are converted to container berths because currently a part of them is utilized as a container stock yard. Cruise terminal and oil jetty are set at the same locations in both cases.

Figure 9.2-3 Salalah Alternative A



Source: JICA Study Team

Figure 9.2-4 Salalah Alternative B



Source: JICA Study Team

9.2.3 Sohar Port

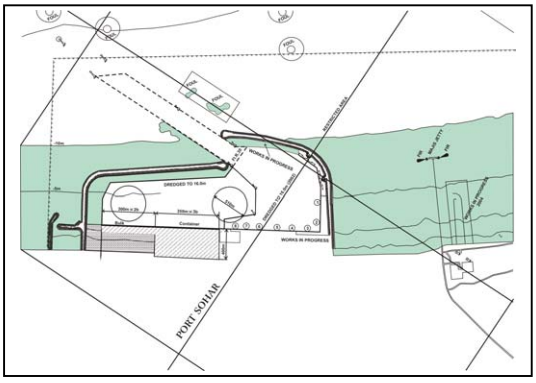
Cargo demand of Sohar Port for 2025 is estimated at 672,000 TEUs, 1 million tons of break bulk cargos, 6.4 million tons of dry bulk cargo, and 9.3 million tons of liquid bulk cargos. Construction of dedicated container terminals should be given priority to support the industrial activities. Many of the heavy industries require specialized berths.

Planning policies for Sohar Port are set as follows;

- Develop port facilities to meet the needs of full scale industrial development
- Coordination with industrial operation plan
- Ensure flexibility for future expansion

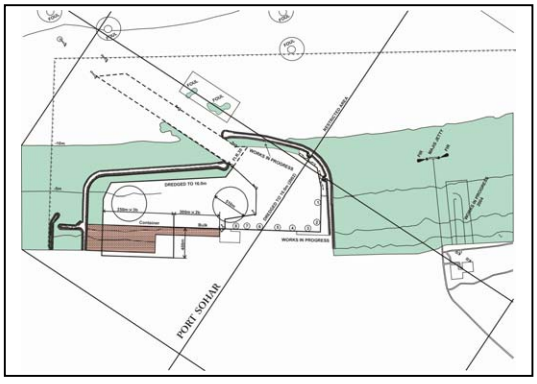
To meet the future demand for 2025, two bulk berths and three container berths will be required. Regarding the layout of these berthing facilities, two alternatives shown in Figure 9.2-5 and Figure 9.2-6 are proposed. In Alternative A, container terminal with 3 berths is centrally located while in Alternative B, dry bulk berths with 2 berths are located centrally.

Figure 9.2-5 Sohar Alternative A



Source: JICA Study Team

Figure 9.2-6 Sohar Alternative B

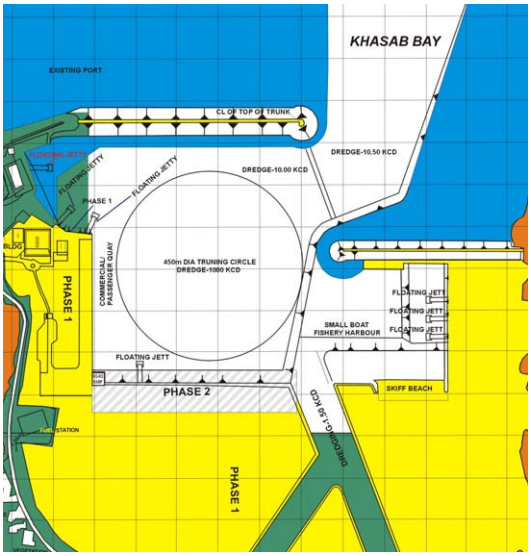


Source: JICA Study Team

9.2.4 Khasab Port

Port activities at Khasab are characterized by small boats which come from and go to Iranian territory. In future it is likely that unregulated types of trade will be discontinued and replaced for example by short-sea roll-on/roll off vessels as the economic growth in both countries continues. It is, however, uncertain that the same level of trade will be maintained between Iran and Khasab. It is important, therefore, to monitor the trend of trade between Iran and Dubai.

Figure 9.2-7 Khasab Port Development Plan



Source: MOTC/DGPMA

Planning policies for Khasab Port are set as follows;

- Improve traffic access to Khasab
- Promote tourism development
- Land use of the reclamation area

Construction works have been almost completed based on the approved development plan shown in Figure 9.2-7. Areas left for expanding berthing facilities within the planned harbor are considered enough to cope with unpredictable port activities in the future. Further expansion of Khasab Port should be based on the careful monitoring of trend in port activities.

9.2.5 Duqm Port

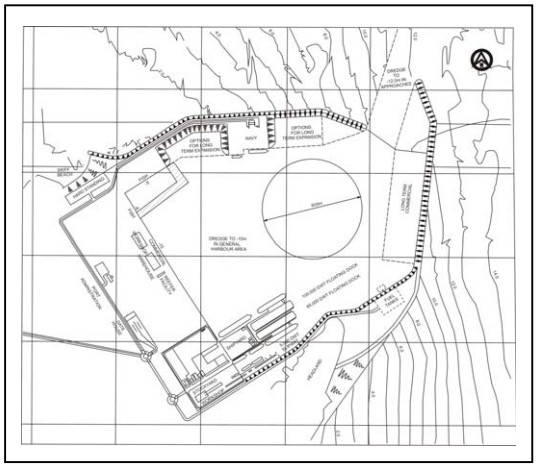
The GSO entrusted a consulting firm with the study for a new port and dry dock complex of Duqm in 2002 and the consultant's proposed facility layout plan is shown in Figure 9.2-5. Regarding the proposed projects, many difficulties can be found. For example, one of the important criteria in selecting a repair yard is whether the dock is situated in business environment where it can acquire sophisticated spare parts for a vessel as quickly as possible. With respect to lime stone export, it is not certain whether the minerals produced near Duqm satisfy required export quality for manufacturing.

Planning policies for Duqm Port are set as follows;

- Utilization of natural resources at Duqm
- National redundancy
- Port as a key social infrastructure

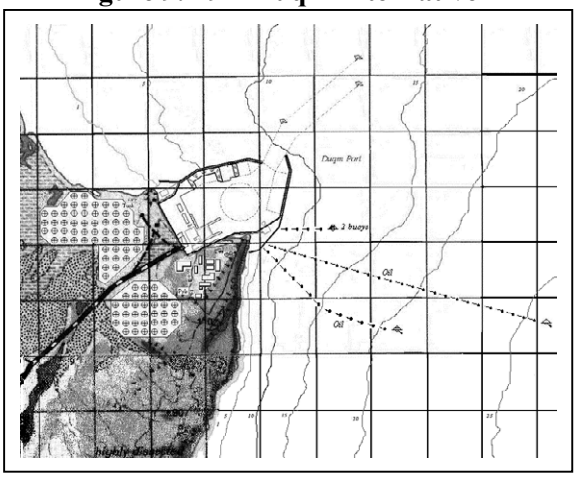
Al Wusta Region is distinguished for having a great number of oil wells, and Duqm is sparsely populated with approximately 3,200 people. One of the possible industries which may take place in Duqm seems to be space-oriented industry such as oil refinery and storage, which may be an added function to the original plan. An Alternative to the originally proposed one is shown in Figure 9.2-9.

Figure 9.2-8 Duqm Alternative A



Source: JICA Study Team

Figure 9.2-9 Duqm Alternative B



Source: JICA Study Team

9.2.6 Shinas Port

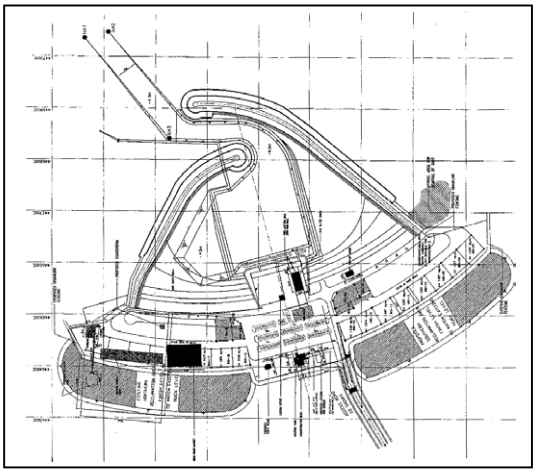
Shinas Port currently functions to handle small-sized Dhows to transport cargo between Iran and to load fish onto trucks for export to Europe via Dubai. Development potential of Shinas Port includes close proximity to large markets and the proximity of the Batinah highway passes near by.

Planning policies for Shinas Port are set aside as follows

- Provide Basic Infrastructure
- Monitor the Port Activities
- Small or Medium scale Development

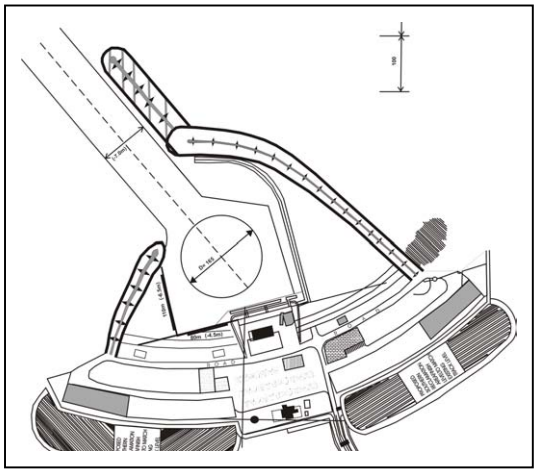
Wali office's proposed plan is shown in Figure 9.2-10, and its key concept is to provide quays in the northern part of the port where commercial activities are expected. The fishery activities are planned in the opposite part of the port. The Study Team proposes an alternative plan as shown in Figure 9.2.-11, which is basically in line with the Wali Office's plan. The alternative plan proposes the widening and deepening of the channel and extension of breakwater to secure the stopping distance.

Figure 9.2-10 Shinas Alternative A



Source: MOTC/DGPMA

Figure 9.2-11 Shinas Alternative B



Source: JICA Study Team

9.3 Environment and Social Consideration

The key environmental impacts of the alternative long-term development plans of the six ports have been identified and are summarized in the following Table 9.3-1. In Table 9.3-2, mitigation measures are proposed for the common environmental impacts of the alternative long-term development plans. Table 9.3-3 lists some of the major stakeholders of each port.

Table 9.3-1 Key Environmental Impacts of the Alternative Long-term Development Plans

Port	Alternative A	Alternative B
Sultan Qaboos	➢ Degradation of air quality from quarrying, heavy vehicle traffic, etc. ➢ Elevated noise level from quarrying, heavy vehicle traffic, etc. ➢ Damage to corals from marine works ➢ Loss of fishing ground near the breakwater area ➢ Distraction of tourist ➢ Resettlement could be required depending on the route of the new access road	In addition to the impacts of Alternative A, Alternative B will have restriction in water exchange and alongshore sediment transport due to the connected breakwater
Salalah	➢ Deterioration of water quality ➢ Loss of benthic and pelagic marine species ➢ Enhancement of coastal erosion and accretion ➢ Loss of fishing grounds near the port and hindrance to fishing activities ➢ Conflict with the Raysut Fishery Harbour, regarding the land / water use	Same as Alternative A since the differences lie only between the location of the bulk and container terminal within the port
Sohar	➢ Deterioration of water quality ➢ There will be an excess of dredged material. ➢ Possible seawater intrusion into the groundwater	Same as Alternative A since the differences lie only between the location of the bulk and container terminal within the port
Khasab (Canal)	➢ Damage to corals from marine works ➢ Possible introduction of non-resident species ➢ Distraction of tourist ➢ Large volume of excavated material require dumping ➢ Possible alteration of the water circulation pattern	-
Duqm	➢ Deterioration of water quality ➢ High risks of contamination from the dry dock ➢ Loss of benthic and pelagic marine species ➢ Partial loss of roosting and feeding area of migratory birds ➢ Possible erosion and accretion of coastline ➢ Temporal relocation of the fish landing area will be required during the construction phase ➢ The fish processing factory may have to be shifted depending on the layout of the port ➢ The drydock activities may have hygienic problems for the adjacent fishery activities ➢ The traditional lifestyle of the local residents could change significantly either in a positive or negative way	In addition to the impacts of Alternative A Alternative B will have risk of oil spill.
Shinas	➢ Elevation of noise level from increase in heavy vehicle traffic ➢ Deterioration of water quality ➢ Hindrance to the local fishermen through the increase in commercial vessels ➢ Excrement from imported goats	In addition to the impacts of Alternative A Alternative B will likely enhance the ongoing shoreline erosion problem due to the extended breakwater.

Source: JICA Study Team

Table 9.3-2 Proposed Mitigation Measures for the Common Environmental Impacts of the Alternative Long-term Development Plans

Port	Category	Mitigation Measures
Sultan Qaboos	Mitigation measures to minimize impact on the natural environment	➢ Use of silt curtain to limit turbidity dispersion ➢ Designing of breakwater which enhance coral settlement
	Mitigation measures to minimize impact on the local residents	➢ Dust suppression by water spraying and dust collector ➢ Employment of noise abatement measures and regular maintenance ➢ Limitation of construction activities during night time ➢ Avoidance of heavy vehicle movement during peak traffic hours ➢ Planning of excavation to minimize degradation of landscape ➢ Construction of new access road
	Mitigation measures to minimize impact on the local fishermen	➢ Compensation to the affected fishermen ➢ The breakwater could function as a new fishing ground
Salalah	Mitigation measures to minimize impact on the natural environment	➢ Dust suppression by water spraying and dust collector ➢ Installation of dust barrier between the bulk and passenger terminal ➢ Use of silt curtain to limit turbidity dispersion ➢ Employment of appropriate coastal erosion restoration technique ➢ The new breakwater will provide new habitat for marine organisms
	Mitigation measures to minimize impact on the local fishermen	➢ Compensation to the affected fishermen ➢ Pre-discussion with the Raysut Fishery Harbour
Sohar	Mitigation measures to minimize impact on the natural environment	➢ Use of silt curtain to limit turbidity dispersion ➢ Installation of impermeable layer to limit sea water intrusion in to ground water ➢ Careful selection of dumping ground of excess dredged material ➢ Dust suppression by water spraying and dust collector
Khasab (Canal)	Mitigation measures to minimize impact on the natural environment	➢ Use of silt curtain to limit turbidity dispersion ➢ Transplantation of the affected corals ➢ Careful selection of dumping ground of excavated material ➢ Construction of bridge to limit obstruction in movement of land animals ➢ Designing of canal to limit landscape degradation ➢ Regular environmental monitoring
Duqm	Mitigation measures to minimize impact on the natural environment	➢ Use of silt curtain to limit turbidity dispersion ➢ The new breakwater will provide new habitat for marine organisms ➢ Employment of appropriate coastal erosion restoration technique ➢ Regular environmental monitoring ➢ Employment of appropriate Waste Management Plan ➢ Construction of oil reception facility
	Mitigation measures to minimize impact on the local residents	➢ Regular interview of local residents regarding their livelihood
	Mitigation measures to minimize impact on the local fishermen	➢ Compensation to the affected fishermen ➢ Installation of dust barrier between the drydock and the fishery terminal
Shinas	Mitigation measures to minimize impact on the natural environment	➢ Use of silt curtain to limit turbidity dispersion ➢ Employment of appropriate coastal restoration technique ➢ Employment of waste management plan
	Mitigation measures to minimize impact on the local residents	➢ Avoidance of heavy vehicle movement during night time
	Mitigation measures to minimize impact on the local fishermen	➢ Clear demarcation of port use between commercial and fishing vessels

Source: JICA Study Team

Table 9.3-3 Common Stakeholders of the Alternative Long-term Development Plans

Port	Stakeholder
Sultan Qaboos	➢ Local fishermen ➢ Local residents ➢ Local shop owners ➢ Local tourism operators
Salalah	➢ Local fishermen ➢ Raysut Fishery Harbour ➢ Local residents ➢ Tourist hotels
Sohar	➢ Local fishermen ➢ Local residents ➢ Local farmers
Khasab (Canal)	➢ Local fishermen ➢ Local tourism operators
Duqm	➢ Local fishermen ➢ Local residents
Shinas	➢ Local fishermen ➢ Local residents

Source: JICA Study Team

9.4 Preliminary Engineering and Cost Estimate on the Pre-screened Alternatives

9.4.1 Sultan Qaboos Port

The remarkable difference between two Alternatives A and B is the length of breakwater. The breakwater in Alternative A is connected to the land, while that in Alternative B is planned without connection. Rubble mound type with armour concrete blocks has been selected as the breakwater structure for the two alternatives. There will be a few overtopping waves because of the low crest breakwater of Alternative B. Pre-cast concrete block type has been applied for both berth structures. The estimated construction periods for each alternative are almost same, i.e., within 4 years.

Based on the collected data so far, it has been found that the berths of both alternatives are well sheltered. However, the berth near the port entrance may be affected by waves from November to March. There is a possibility that the width of the port entrance can be reduced to ensure greater calmness. Considering the scale of the port development, the base data is not adequate to finalize the layout of the breakwater. Wave observations at the proposed site of the breakwater should be carried out for at least one year. The effectiveness of the proposed breakwater layout should be verified by model testing using observed wave data.

9.4.2 Salalah Port

As pre-cast concrete block type was applied for the existing berth structure, it is also applied to the structural design for both alternatives as well. The most important aspect is to devise an implementation program that will not hinder the present port operations. The estimated construction periods for each alternative are 4 years for Alternative A and 3.5 years for Alternative B, respectively.

9.4.3 Sohar Port

As there is no significant difference in the design and cost estimate between Alternatives A and B, Alternative B has been regarded as the representative. As pre-cast concrete block type was applied for berth structure in the southern half of the port, it is also applied to this structural design in the northern half of the port as well. Environmental assessment should be carefully conducted around offshore dumping area because of the huge dredging volume approximately 18 million m^3 involved. It is also important to plan an appropriate implementation program that will not hinder port operations. The estimated construction period is 3 years.

9.4.4 Khasab Port

As for Long-term development, the construction of a 400 m quay wall is tentatively planned in front of commercial zone. As an option of the Future Development Plan at Musandam Region, the canal project, which enables small boats to pass through, has been discussed.

9.4.5 Duqm Port

Based on the Feasibility Study (Haskoning, 2004), rubble mound type has been applied for the structure of breakwater, while pre-cast concrete block type has been applied for the quay wall in Alternatives A and B.

As two breakwaters require a lot of rock materials, it is important to ensure appropriate quarry are available and as near as possible. Since the progress of breakwater work influences all other works. Moreover, dredged material was expected to be unsuitable for reclamation, and no quarry site was found out around Duqm Port during the site visit. The dredging work can not start until the main breakwater provides calmness inside the port area despite the significant dredging volume of approximately 13 million m^3. The estimated construction periods are almost the same (3 years) for both alternatives.

9.4.6 Shinas Port

The estimated construction periods are almost same (1 year) for both alternatives. The construction works are to be financed by the public sector.

The results of cost estimate for long-term development plans at each port are summarized in Table 9.4-1. The annual maintenance cost does not include the renewal cost of equipment.

Table 9.4-1 Summary of Capital Cost and Annual Maintenance Cost

		Public Sector		Private Sector	
		Capital Cost	Annual Maintenance Cost	Capital Cost	Annual Maintenance Cost
Sultan Qaboos Port	Alternative A	91.00	0.10	49.00	1.20
	Alternative B	88.00	0.10	49.00	1.20
Salalah Port	Alternative A	126.00	0.20	102.00	2.50
	Alternative B	122.00	0.20	102.00	2.50
Sohar Port	Alternative A	-	-	-	-
	Alternative B	60.00	0.30	34.00	0.80
Khasab Port	Proposed Plan	4.00	0.01	0.00	0.00
Duqm Port	Alternative A	82.00	0.14	22.00	0.37
	Alternative B	102.00	0.34	22.00	0.37
Shinas Port	Alternative A	3.50	0.01	0.00	0.00
	Alternative B	4.00	0.01	0.00	0.00

Unit: R.O. million
Source: JICA Study Team

9.5 Preliminary Management, Operation and Financial Scheme

Following matter should be noted as a common understanding (see Chapter 10.):

For major ports, the existing managing organizations are assumed to continue their ports in future. Smaller ports are run by the GSO. While port privatization is a fundamental strategy of Oman, GSO will operate small ports until such time that a private firm shows interest.

GSO will continue its investment in basic port infrastructure.

Structure and size of port managing organizations are affected by a number of unpredictable factors, such as technology development of ship and port, outsourcing, labour practices, education level, global security issues and so on. Some of these factors are now rapidly changing. It is difficult to predict management structure and employees more than 20 years ahead.

9.5.1 Sultan Qaboos Port

Services of Sultan Qaboos Port will stay unchanged to 2025, and organizational structure will also stay be relatively unchanged. However, outsourcing, security requirements and IT utilization will change, and may affect structure and manning. Some immovable is likely to be built by PSC without public decision process. GSO will invest in the breakwater whichever alternative is adopted.

In the 2025, to meet the forecasted increase of cargo, 6 gantry cranes, 12 RTGs, and 24 yard chassis will be added. According to a rough calculation considering the offset of present staff shortage vs. technological progress, the number of employees will have to be a little more than doubled in the target year including workers in engineering, marine services, and administration.

Difference between two alternatives will not affect the structural and manpower requirements.

9.5.2 Salalah Port

Existing Concession Agreement is effective until 2028. According to investment sharing arrangement between GSO and SPS, basic infrastructures will be provided by GSO. New port facilities built after berths 5 and 6 are completed will probably be operated by a body other than SPS.

The Alternative B is more contributing a smooth cargo flow without splitting the location of container facilities, but it will not affect the structure and manning of SPS.The headquarters, which is now located in Muscat might move to Salalah following growth of related and ancillary industries in Salalah, with a small liaison office laced in Muscat.

Number of employees is 1,300 in 2004, 1.5 times more than 2001. Traffic demands in 2025 are around 3 times more, and 21 gantry cranes, 42 RTGs, 3 mobile cranes are planned to be added. Manpower will have to be nearly doubled according to rough calculation. Difference between the two alternatives will not affect the organizational structure of employment.

9.5.3 Sohar Port

SIPC, the concessionaire, runs the port in a landlord type management. The present staff number only 20-30, and even in future, a large increase in staffs will not be required. Cargo handling operations and marine services are conducted by the contracted company. SIPC will hire mainly management staff. Uncertain factor is the outsourcing of security staff. But even in this case, required number of personnel is not expected to exceed 100 in the target year.

Since the difference between the two alternatives is only the location of the container and bulk terminal, arrangement in terms of investment, management and operation is the same.

9.5.4 Khasab port

GSO intends to seek private management. Characteristic of customers and services will not become until negotiations with the private sector candidate, are completed. Because this port will not be highly profitable, GSO will bear a part of the management cost even after privatization.

Landlord type similar to Sohar Port Concession may be applied. At present, 12 members DGPMA are working here, and GSO would have to operate the port for a while in a similar manner.

9.5.5 Duqm Port

GSO has to provide almost all facilities. The main operation has to be carried out by GSO until appropriate concessionaire(s) is found. While there are some firms showing interest, due to lack of facilities and utilities (residence, airport, lifeline etc.), it will take certain time to privatize the port.

Since Duqm port is a complex of various functions, it is difficult to assume the type and numbers of the concession. Very preliminarily, a single Sohar type landlord management may be considered suitable (the Report of Posford Haskoning also recommends a landlord type port authority).On the other hand, single management risks losing flexibility in each sector business.

If GSO provides the site for the oil industry to attract possible concessionaire, financial burden in the initial stage increases in Alternative B, however, the cost will be recovered in the long run. For the additional facilities in Alternative B, because the site is leased out to the concessionaire(s), neither GSO nor the port authority bears additional burden.

9.5.6 Shinas Port

Shinas Port is now operated by the GSO, with 5 employees from MOTC and 3 from MOAF. Fishing activities of the port will continue for the future. Commercial activities will be limited, and therefore GSO should primarily carry out operations. The organization should be simple to minimize management costs.

Alternative B is a bit less costly, however, financial burden largely depends upon customers' willingness to use the port. In this respect, Alternative B may be superior.

9.6 Screening and Selection of Long-term Development Plan of the Study Ports

Pre-screened alternatives for each Study Port have been evaluated from various aspects such as economic, engineering and environmental and social considerations to select the best alternative as a long-term infrastructure development plan.

For Sultan Qaboos Port, Alternative B (shown in Figure 9.2-2) should reduce construction cost by O.R. 3 million in comparison with Alternative A. Regarding the environment and social aspects, Alternative A will have adverse impacts such as deterioration of water and sediment quality.

For Salalah Port, it is estimated that construction cost of Alternative B (shown in Figure 9.2-4) is lower by O.R. 4 million than that of Alternative A. From the port operation perspective, Alternative B will permit smooth container cargo movement.

For Sohar Port, the sole difference between the two alternatives exists in flexibility for future expansion. Alternative B (shown in Figure 9.2-6) is superior to Alternative A from the view point of smooth cargo flow and efficient port operation in the future stage.

Government approved plan for Khasab Port (see Figure 9.2-7) seems to have sufficient capacity, and unpredicted port traffic could be accommodated by constructing new quay walls at the northern part of the reclaimed area. Careful monitoring on the trend of the port activities is recommended.

For Duqm Port, Alternative B (see Figure 9.2-9) would be more socio-economically viable in the long run than Alternative A. The former could give favorable and greater economic impacts to the region than the latter though the construction cost is naturally higher in Alternative B.

Although construction cost of Alternative B for Shinas Port (see in Figure 9.2-11) is higher than Alternative A by O.R. 0.5 million, the former is sound from the engineering perspective and consequently will give more favorable economic benefits to the region.

In the overall evaluation Alternative B was considered superior at each port, and was selected as the long-term development plan. In order to materialize the long-term master plans, a total of O.R. 380 million is required as capital cost for the public sector, and O.R. 226 million for the private sector.

Table 9.6-1 Summary of Required Investment by Sector

(Unit: R.O.million)

	Public Sector		Private Sector	
	Capital Cost	Annual Maintenance Cost	Capital Cost	Annual Maintenance Cost
Sultan Qaboos Port	88.00	0.10	49.00	1.20
Salalah Port	122.00	0.20	121.00	3.00
Sohar Port	60.00	0.30	34.00	0.80
Khasab Port	4.00	0.01	0.00	0.00
Duqm Port	102.00	0.34	22.00	0.37
Shinas Port	4.00	0.01	0.00	0.00

Source: JICA Study Team

10 LONG-TERM REFORM PLAN FOR PORT ADMINISTRATION & MANAGEMENT

10.1 Current System of Port Administration

Present situation on administration, management and operation is summarized in Chapter 2 of this summary report.

There is no clear standard of port administration or form to make concession agreements. Table 10.1-1 shows present managing organizations and respective functions.

Table 10.1-1 Role of Management

Function	Qaboos	Salalah	Sohar	Khasab	Shinas	AdDuqm
Construction of Infrastructure	GSO	GSO	GSO	GSO	GSO	n.a.
Construction of Superstructure	GSO/PSC	SPS	User	GSO	GSO	n.a.
Management	PSC	SPS	SIPC	GSO	GSO	n.a.
Maintenance	PSC	SPS	SIPC	GSO	GSO	n.a.
Repair	PSC	SPS	SIPC	GSO	GSO	n.a.
Ship Handling	PSC	SPS	User/Sub contractor	GSO	GSO	n.a.
Cargo Handling	PSC	SPS	User/sub contractor	GSO	GSO	n.a.
Passenger	PSC	SPS	n.a	GSO	GSO	n.a.
Marine Service	PSC	SPS	User/Sub contractor	GSO	GSO	n.a.
Nautical Control	PSC	SPS	User/Sub contractor	GSO	GSO	n.a.

Note: GSO is managing Khasab and Duqm on a temporary basis until a concessionaire takes over the functions.

Source: MOTC

10.2 Issues on Port Administration, Management and Operation

Reviewing the current situation of the port sector in the Sultanate, the Study Team identifies issues which require urgent attention as follows.

(1) Insufficient port capacity

1) Insufficient cargo handling capacities are observed at the major commercial ports, i.e. Sultan Qaboos and Salalah.

2) Insufficient capacity would divert potential customers to outside of Omani ports, i.e. mainly to Dubai and other UAE ports.

(2) Slow Response to Urgent Matters

1) Current insufficient capacities at Omani ports stem from the slow decision-making process

of the Port Authorities as well as of the government.

2) Structure and function of port administration is partially responsible for the slow decision-making process.

3) Slow response by the Port Authorities is also related to the present control of public/private joint stock company by the government.

4) MOTC has failed to respond to port users' requirement by taking necessary measures in a timely manner.

Improvement of the ports' service efficiency is the central issue. Existing port administration system involving port authorities, MOTC, MOF, MONE and MOCI as well as Customs has to be reviewed from the view point of business environment. Especially, the decision process for the development of basic infrastructures as well as superstructures and software needs to be streamlined for greater efficiency.

(3) Implementation of Port Projects in the Past Five Year Plans

In the past Five Year Plans, actual disbursement for the port development listed in the five year plans is seldom fully materialized and remaining parts are carried over to the next five year plan. On the other hand, some projects not initially listed in the Five Year Plan are carried out.

The scale of past Five Years Plans was insufficient to meet the traffic demand at the major ports partly due to GSO's tight financial position and partly owing to inappropriate allotment of budget in terms of urgency or capacity for the demand.

The Five Year Plans do not list investment programs financed by the private sector including port authorities which are managed by joint stock company under the concession agreement.

(4) Lack of Long-term Planning Policy in MOTC

Since development of port infrastructure is the responsibility of the government, budget request for the port development has to be delivered to MOF through MOTC and MONE.

Even though request for infrastructure investment is prepared by the Port Authority, interface between the Port Authorities and MOTC is not effectively functioning. This is partly because the timing of request from the ports is delayed and/or MOTC does not have initiative to formulate the national port development plan.

Due to the shortage of staff, DGPMA has no capability to take initiative for port development as well as to coordinate related government agencies.

10.3 Reform Plans for Effective Project Implementation System

(1) Implementation of Port Projects in the Five Year Plan

The projects listed in the Five Year Plans should have more priority at implementation.

The Five Year Plan should contain projects of major ports authorized by the proposed Port Planning Council (PPC). Important programs of port authorities, which were considered as private sector investments and not always listed in the previous Five Year Plans, should also be incorporated in the Plan.

(2) Mobilization of Private Resources for the Port Development and Management

Although port infrastructures are provided by the government at present, the cost incurred for such investment should be reflected to the benefit enjoyed by the concessionaires and port operators not necessarily to be covered entirely during the determined concession period.

Policies in terms of GSO recovering its investment, and oversight of operation and performance may need to be reviewed in light of a fair balance of benefit sharing among public and private sectors. In this connection, creating a "level playing field" for all the ports as well as considering degrees of development stages is necessary.

Presently port infrastructures are developed by the government and superstructures are provided by the port authorities. Infrastructures defined at PSC include buildings such as transit sheds, stores and workshops besides basic port structures. Quayside cranes and yard cranes are categorized as superstructures except for first phase gantry cranes at Sultan Qaboos port.

As major ports improving financial position with growing traffic, a part of the infrastructures such as buildings which, were formerly provided by the government should be transferred to the responsibility of ports without delay.

(3) Long/Short Term National Port Development Plan

For timely port investment, better understanding and close cooperation among relevant government agencies, local governments, port authorities and related business are indispensable. Oman has some coordinating machineries such as the Supreme Committee for Town Planning, the special committee of related agencies and/or steering committee for project implementation.

However, no policy or plan for nationwide port development exists in the context of long-term national economic development frame work. With such a policy and plan, more concerted action for port investment could be achieved.

(4) Port Planning Council

In order to effectively establish the above policy and plan, creation of a Port Planning Council (PPC) in MOTC is recommended. The function of PPC is to authorize the long term and short term port development plans by coordinating opinions and interests of related government agencies and port

users.

Major port authorities are responsible to prepare draft long term and short term port development plans and submit to PPC. Except for minor alteration, any revisions to the plan also need to be sent to PPC for approval. Some important/fundamental policies on port development and management matters may also be discussed.

All decisions or conclusions shall be taken to a higher level for authorization. After being authorized the plan should be widely respected by all departments of the government and related organizations.

The Council will consist of representatives of MOF, MONE, MOMWER, MOCI, MOAF, ROP (Custom, Immigration and security), Hydrographic Department, relevant Port Authority's CEO, as well as related local governor, representatives of port users and learned persons of port and shipping business.

10.4 Reform Plans for Effective Participation in Development, Management and Operation of the Port

Furthering the private sectors role in financing additional investments is one of the objectives of the Sixth Five-year Plan, however, for the moment, GSO bears all expenses of basic infrastructure development. As 30 years has elapsed since the emergence of modern Oman, investment capability has accumulated in the private sector.

Under these circumstances, in the near future port authorities may have the financial strength to bear a part of investment costs, or attract investors to the basic infrastructure in the Omani financial market.

Since terms of Agreement between GSO and port authorities differ from one another, and this management backgrounds and styles also differ, it is not appropriate to establish a uniform ruling. And before requiring port authorities to share infrastructure investment costs, consideration should also be given to the degree of public investment in port infrastructure of competing ports in the neighboring countries.

At present and in the near future, it is not expected that Sultan Qaboos and Sohar port will have the financial capability to bear all the cost of basic infrastructure. The situation of Salalah port will be discussed in iii) of 10.9 (3) 2).

10.5 Reform Plans for Oversight of Management and Operation

(1) Oversight and Regulation/Deregulation by Government

Since the privatization of port management works has been successful so far, this policy should continue in future. One of the advantages of privatization lies in the quick decision making process of the private sector. However, external and internal decision procedures tend to be duplicated and too

complex to make timely investments.

To improve this situation, the following steps are recommended:

1) Some of the Government's regulatory function is necessary for ensuring port authority's performance in good order, however, in order not to impose an excessive burden on port authorities, the degree of oversight should be minimal. The government should "monitor" rather than "control," and "advise" rather than "intervene". In this connection, a part of infrastructure such as buildings and other facilities which were formerly financed by the government should be financed by the port.

2) Procedure of the Financial Audit should be reviewed so as not to hinder the port authority's day to day activity. Since the Audit's purpose is to inspect fiscal expenditure, the relevant ministry can be audited rather than the port authority.

3) Explicit and implicit government regulations exist under the current SAOG system. Naturally, some of the regulatory functions cannot be totally eliminated even in the case of private port operation. However, for a port to be more competitive with neighboring ports, efforts must focus on expediting the decision making process in the port.

It is recommended, therefore, to review the decision making procedure within the port as well as among government agencies concerned, so that the necessary action to strengthen competitive ability of the port can be taken without delay.

In this respect, the Board structures in the Port Authorities need to be reviewed so as to reduce multiple steps for auditing at every stage of program implementation.

4) In order to make timely investments in port infrastructure, (infrastructure already accommodated in Five-Year Plans), DGPMA should have more authority, and the examination procedure of relevant ministries should be streamlined. Creation of PPC may contribute to give more authority to DGPMA.

(2) Legal Instrument

Since the current schemes (i.e. individual port management, a combination of specific legislation and concession agreements) have functioned well in general, the schemes should continue although some modifications will be needed on a case by case basis. From the government point of view, government has means to oversee the behaviours of port authorities through concession agreement, in a flexible manner. The commercial law and rules also function to keep companies performance standards. These schemes should in general be maintained.

In the Omani legal system, comprehensive management scheme for coastal and adjacent water areas may be reviewed. While these areas provide a precious resource for human activities including fishing, tourism and environmental conservation, in many countries it proves a difficult task to effectively balance the needs for utilization and preservation in the area. Without adequate regulatory schemes, these areas rich with valuable resources will be facing the threat of disorderly utilization. It is desirable,

therefore, to set up inter-governmental machinery with coordinating and advisory functions.

One issue concerning port and maritime activities is building and operating of non-commercial ports, such as oil and gas terminals at sea, jetties for loading gravels and minerals, and marinas.

These facilities might affect marine and port circumstances such as security of port and coastal area, customs and emigration control, safety of navigation and land transport of cargo. MOTC has statutory power to approve building of non-commercial structures serving for loading/unloading certain commodities, and MOTC should exercise its power with a view to maintaining orderly usage of the port and maritime environment.

Also, it may be recommended that measures should be studied to formulate a comprehensive policy of coastal and water area management and to draw up the area's utilization planning, as well as drafting the implementation guideline. For these far-reaching works, a machinery may be required, and it may be one idea to expand the function and resources of the Supreme Committee of Town Planning, which has similar experience on land.

10.6 Cultivating Skill of Omani Nationals

While major ports currently satisfy the target of Omanization with strenuous efforts, it may be difficult to realize a higher ratio in future due to the high skills required for operation and it is therefore desirable that current Omanization target stays at the present level.

Major port authorities draft and implement schemes to strengthen their workforce, for example by changing work shift, training for multi-skills and expansion of IT utilization.

It is clear, however, that even with these steps, port industries' requirement for human resources may not be satisfied. Recently two plans to create educational organizations in terms of port management, maritime officers, civil and maritime engineer and so on has been proposed. These are beneficial for both relevant industries and younger generation of Omani nationals, and it is recommended for GSO to assist in the establishment of these institutions.

10.7 Enhancing Nationwide Port IT Network

After introduction of the first generation of IT system in MOTC and major ports, next step is to establish an integrated IT network to connect major ports as well as related agencies by EDI. In order to serve users, namely, relevant agencies, port authorities, shipping agents, forwarders and land transporters, establishment of a port LAN in DGPMA and unified EDI interface is required for the first phase of the network development.

So-called "Single Window" system connects all the relevant agencies electronically and allows each organization to collect and exchange data through the network. Port users will submit only one document with unified format, which will be delivered to all agencies automatically.

An integrated EDI system will connect each port at DGPMA Information Center, and all relevant agencies will have access to required information. Therefore, it is recommended that MOTC take the necessary steps for establishing the IT port network.

The DGPMA Information Center will require a certain sized staff including personnel with specialized skills. Staff increase may be a burden to MOTC, however, the network system will not work properly without the right staff. It is recommended that MOTC hire and train an adequate member of employees including expatriates where necessary.

10.8 Preliminary Consideration on the Enforcement of SOLAS 2002 (ISPS Code)

The Diplomatic Conference on Maritime Security held in London on December 2002 adopted a series of amendments to the Safety of Life at Sea Convention (SOLAS) 1974, and a number of Resolutions with the purpose to strengthen maritime security and to prevent and suppress acts of terrorism against maritime transport sector. The amendments include Chapter X-2 and the International Ship and Port facility Security (ISPS) Code.

Within a period of only 18 months since the Conference's adoption of the new SOLAS Convention, about five thousand Port Facility Security Plans, which was equivalent to more than half of the total, had been submitted to their Contracting Governments.

Both of the major commercial ports in this country, namely Sultan Qaboos Port and Salalah Port, submitted Port Facility Security Plans to the government and have been in compliance with the ISPS Code since 01 July 2004. Budgets have been allocated to Sultan Qaboos Port for the renovation of the port gate in order to tighten port security although actual works are yet to be commenced.

Submission of the Security Plans at Sohar has been delayed because entire port is still under construction stage. SIPC has a plan that permanent security arrangements are to be in place by the beginning of 2005.

10.9 Optimum System for Port Administration, Management and Operation

(1) Short Term Agenda for DGPMA

The objectives of DGPMA stipulated in the Royal Decree covers necessary aspects in respect to the port administration. However, effective number of professional staff is far from enough to cover the given tasks of the DGPMA.

1) Strengthening of DGPMA staff

For MOTC to effectively carry out its functions, particularly those relating to planning future development and overseeing the performance of the port authorities, it is recommended to strengthen the staff in DGPMA headquarter by adding at least 10 technical staff to complement the present 7 professional staff. Other than above, a legal and technical advisor, a statistician, IT experts should be

recruited (see 9.4.6).

2) Creation of Assistant DG for Maritime Affairs

Because of the nature of maritime administration which involves various international conventions and control over merchant marine shipping, the staff requires special expertise which is different from port engineers. Moreover, the recent increase in the workload necessitates frequent attendance to many matters by DG. Therefore, as a short term measure, it is recommended that the position of an Assistant DG for Maritime Affairs be newly created. [See (2) 1)]

3) PPC Secretariat

As has been recommended in (4) of the section 10.3, PPC should be created to formulate the long-term port policy as well as the Five-year Plan. One of the policy and planning experts in DGPMA should be assigned to the Secretariat of the Council.

(2) Long Term Reform of DGPMA

1) Separation of Maritime affaires from DGPMA

After creation of an Assistant DG for Maritime Affairs as a short-term measure, separation of Maritime affairs from DGPMA is recommendable in the future as creation of national merchant marine fleet, international requirement for security and environment, coastal and water area management will increase the responsibility and function of DGPMA.

2) Enforcement of maritime rules

Presently the port authorities are entrusted to manage maritime affaires such as harbor masters function, and functions of port security and environmental protection. Although enforcement of international rules in this regard is the responsibility of the government, many of the works are carried out by terminal operator/port authority.

DGPMA has a responsibility under the provisions of SOLAS 2002 and ISPS Code to approve Port Security Assessments and Port Facility Security Plans submitted by port authorities, and to inform to IMO and to the shipping and port industries. Some of the measures to prevent the pollution or to maintain security are a financial burden to a private terminal operator.

In the light of above situation change, both port and maritime sector of DGPMA should be more involved in the enforcement of maritime rules.

3) Creation of National Port EDI Center

Creation of the National EDI Center in MOTC will facilitate not only the collection of port and maritime statistics from the Port Authorities but the exchange of data among Port Authorities, Customs, Immigrations, Quarantine, Shipping Agents, Traders and DGPMA.

(3) Agenda for Major Port Authorities

Present port administration systems at PSC, SPS and SIPC are generally following the basic principle of GSO's privatization policy in which public service joint-stock companies act as port authorities. Although the detailed forms of private sector participation differ by ports, general principle of the above system will be continued for the foreseeable future.

Degree of public presence and share of profit from the operation among public and private sectors vary by ports. While PSC contributes the highest share of its profit to the government, SPS is producing fewer earnings relative to its size of the facilities and activities. SIPC is still at the preparation stage and actual financial performance is not made available at present.

1) PSC

PSC has improved its financial position remarkably by restraining expenditures and increased revenues in recent years; however, its cargo handling efficiency is not comparable to the international standard.

The responsibility for the present relatively low efficiency does not entirely rest with the management but is partly due to the layout of the port and partly due to demarcation of infrastructure investment responsibilities between the government and PSC, and other regulatory system including budget approbation and auditing procedures [see 11.5.1(1)].

The present concession contract of PSC will expire in 2006 and the operator and the form of concession are not yet determined. Renewal of the contract may be the good opportunity to review present management system of PSC.

However, considering that the port has a workforce of over 600, its high financial contribution to the government, and that the port must continuously be operational during transition period of the contract; there is no reason to change the present concessionaire.

2) SPS

i) Financial aspects of SPS

The present concession period lasts for 22 more years. Although the detailed conditions of the concession contract have not been made public, the basic contents of the agreement should not be altered unless any significant discrepancy or major changes in the government policy arise.

When comparing the financial contribution to the government with PSC, SPS generates less revenue for the government. This is partly due to its relatively early stage of operation, but also due to its management contract fee payment to AP Molar and to the volume discount tariff system. Because more than 70% of vessels calling Salalah port belong to Maersk Sealand line, by applying the volume discount, actual receipt to SPS is considerably low. The concession agreement is said to prohibit SPS from setting its tariff lower than the level of PSC's, however, due to the above, volume discount might result in an actual tariff level that is lower than PSC.

SPS is exempt from income tax for the initial 5 years of the concession contract and that has been extended for another 5 years.

Although extension work for berth number 5 and 6 will require additional expenditure to the port, recent favorable financial performance will enable tax payment by SPS.

Therefore, following measures may be recommendable as long as such alteration does not conflict with basic conditions of the concession agreement between SPS and GSO.

- Present volume discount to the tariff should have a certain limitation so that the discount of additional volume of containers loaded/unloaded by a shipping line should not be lower than 50% of the normal tariff level.
- Present tax exemption (extended after the initial 5 year exemption) should be terminated as soon as possible.

ii) Raysut terminal

In 2000, SPS took over management of Raysut terminal which had been managed by MOTC. Raysut terminal was built to serve for local cargo such as cement, minerals and other local products for export and some import from neighboring countries. Due to recent growth of transshipment container handling at the container terminal, some of the feeder vessels use conventional cargo berths at Raysut terminal. Because of this situation, some of the non-container vessels and cargoes have difficulty of reserving a berth or a yard space. This is one of the reasons that it has been difficult to attract tenants to the Salalah industrial estate.

Even though handling of non-container cargo is less profitable than containers, SPS should manage Raysut terminal and take care not to disturb local cargo handling capacity.

iii) Financing of infrastructure development

According to the Concession Agreement, it is the duty of GSO to build No. 5 and 6 container berths funded by GSO. In general terms, GSO should bear the burden to build further container berths; however, there are views that the existing Agreement is applicable to the construction of berth No. 5 and 6, and no more. If this is the case, GSO is legally free to ask SPS to share a part of infrastructure investment, or to choose another concessionaire among certain candidates.

As one way to obtain a suitable terminal operator, GSO invites new private investors for new infrastructures on the condition that the government will bear a certain portion of the cost. This way of infrastructure development is a kind of BOT or BOO, of which there are many examples for port development throughout the world.

However, although a new concessionaire may be theoretically possible, a newcomer would be hesitant to compete with SPS at existing berths, especially if it does not receive the same benefits (i.e. GSO bears all basic infrastructure costs).

3) SIPC

The major source of revenue for SIPC is generated by leasing land to industries in the Sohar Industrial Area. Eighty percent of the received rent has to be paid to MOF while twenty percent can be retained by SIPC. Even though the total industrial area is 2000 ha, 500 ha have to be set aside for roads and other infrastructures.

Therefore, the revenue obtained by SIPC is not very large. The management contract to Rotterdam Port Authority requires payment of a management and franchise fee. Cargo handling charges become revenue to the stevedore which pays only land area and quay rent to SIPC.

Considering the amount spent on the infrastructure development, the expected receipts from leasing the land may not be sufficient to recover investment within the concession period. Although the GSO expressed its policy that no direct infrastructure cost will be borne by the government after 2006, it may be difficult to pass on the cost of additional infrastructures to the new tenant, or otherwise to charge all the tenants according to the area occupying.

(4) Agenda for Other Commercial Ports

1) Khasab

According to the previous Five-Year Plan, Khasab port is planned to be privatized. Although the port construction work is near its completion, MOTC manages the port directly at present. Considering the limited potential of extensive commercial operation in the port, port management by any party may not be profitable. The government may ask a private manager to manage the port but will have to provide certain subsidies until it becomes self supporting.

2) Shinas

Similar to Khasab port, Shinas port is not expected to generate sufficient revenue by its management and operation. Therefore, if the management has to be handed to a private sector, MOTC may have to subsidize it for some period in the future.

3) Duqm

Duqm is a ‘greenfield port’. GSO decided to provide the port and other infrastructure. While it is premature to predict what form of management will be adopted under the present business environment in Oman, operation will likely be conducted by the private sector(s). Since it is envisaged that port activity alone cannot enough earn revenue to meet the management expenditure, management should be limited to a landlord type authority similar to SIPC. Within this scheme the Port Authority leases the land and waterfront to the ship yard, fishing port and other terminal user/operator(s).

(5) Reform of Customs Procedures

Out-dated customs procedures need to be overhauled in the light of modern transparent customs procedures. One of the most urgent remedies will be to introduce IT system into the custom procedure.

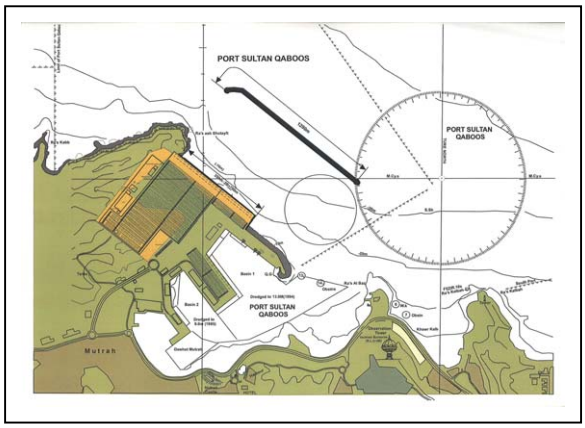
At the same time, it is necessary to simplify documentation and customs duty assessment system, and to re-train custom officers adaptable to more international business. Even though official language is Arabic, international business documents are written in English. Acceptance of English documents through EDI may be necessary for efficient customs.

11 PHASED DEVELOPMENT PLAN AND SELECTION OF PRIORITY PROJECTS

11.1 Formulation of Phased Development Plans of Major Ports

11.1.1 Sultan Qaboos Port

Figure 11.1-1 Sultan Qaboos Port 1st Phase



Source: JICA Study Team

First phase development is to expand container handling capacity by building a new terminal with two deep berths as shown in Figure 11.1-1. Excavating hills for taking rocks and filling required for the civil works will produce an additional 24 ha of yard space in the first phase development.

After completion of the first phase, the total container handling capacity will go up to 680,000 TEU per annum.

Second phase development is to demolish transit sheds, workshops and rearrange storage areas to create approximately an additional 100,000 TEUs capacity, and should be completed by the middle of the 9th 5-Year Development Plan, but preferably by the end of the 8th Plan. This additional container handling capacity can trigger the rearrangement of berth allocation, and will allow cement handling operation to shift from No.8 berth to No.4 and No.5 berths.

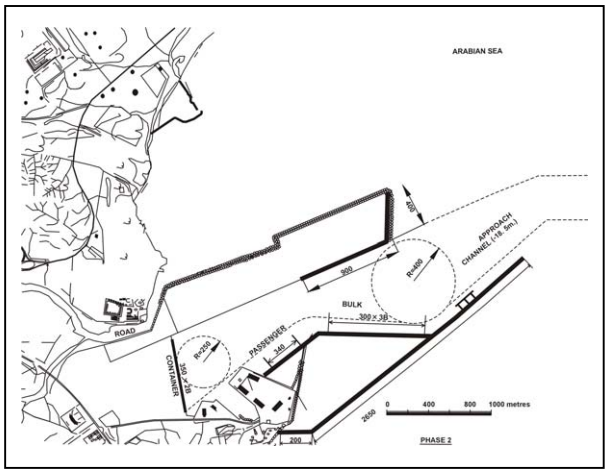
Final phase development is to add one more container berth at the outer harbour. Civil works involve extension of the breakwater by 300m. Newly created yard and berth space will provide additional container handling capacity of 200,000 TEUs. This final phase development should be implemented by 2020 to cope with traffic demand.

Overall rearrangement of berth allocation can be implemented at this phase in association with commissioning of a newly developed port which would handle conventional cargoes. Cruise terminal would be shifted and extended from No.6 berth to No.7 berth. A portion of the port area and its adjacent area could be converted to a port-initiated amenity zone for tourists and the public in general. Land use planning in and around the port area should be well coordinated with city planning.

11.1.2 Salalah Port

First phase development of Salalah Port, which is shown in Figure 11.1-2, aims to promote regional economic development by providing sufficient area for cargo handling as well as to provide extra container handling capacity after the on-going project. To cope with future container traffic, No. 30 and 31 berths could be converted to a container terminal because these berths adjoin the existing container terminal and because they have already been utilized as container stocking yard.

Figure 11.1-2 Salalah Port 1st Phase



Source: JICA Study Team

New bulk terminal with three berths will be built at the north end of the new reclamation area. A new passenger terminal will also be built on the reclamation area facing the existing container terminal. Government vessels can also utilize the passenger berth with careful scheduling and coordination. Oil jetty has to be relocated at the back side of the newly built breakwater.

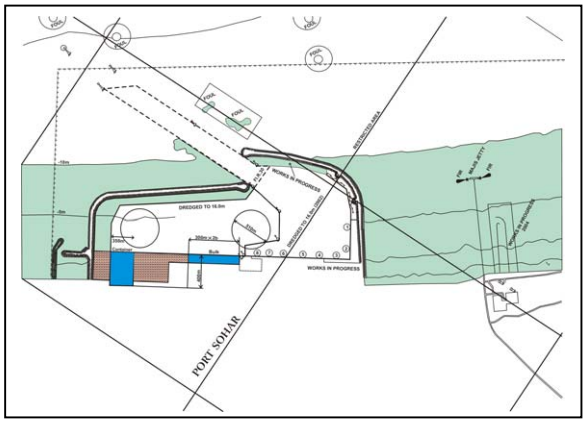
It is proposed that the first phase development be implemented during the seventh 5-Year Development Plan in order to avoid capacity shortage and to attract prospective investors to the Free Trade Zone.

Second phase development is the widening of the existing container terminal to the north by reclamation and construction of a total of five berths from No.7 to No. 11 with a total length of 1,750 m as the demand increases. Total width of the terminal will become 800 m.

The final phase development is construction of a dedicated government berth to the north of the container terminal, if required. Future extension space can be found further north. Break bulk terminal can be shifted from the existing conventional cargo terminal if necessary.

11.1.3 Sohar Port

Figure 11.1-3 Sohar Port 1st Phase



Source: JICA Study Team

Taking into consideration both the forecast demand and terminal capacity, two berths for bulk cargoes and one dedicated container berth are required in 2010. Proposed facility layout for the first phase development is shown in Figure 11.1-3.

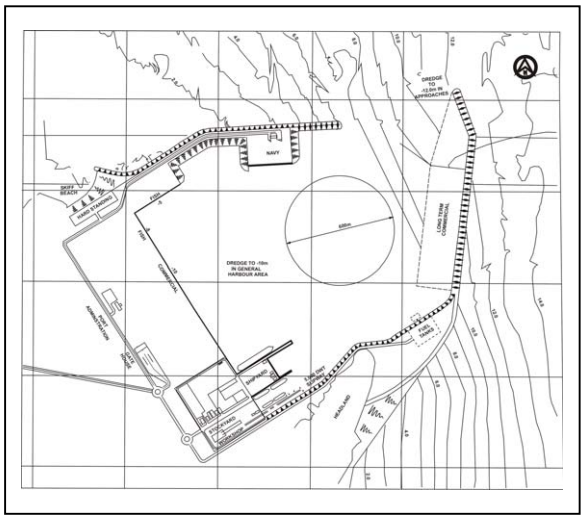
Container terminal's location is suggested to be at the northern end of the waterfront industrial area, i.e. at the foot of the northern breakwater. This proposed plan has flexibility for future use of the shore line between the proposed bulk terminal and the container terminal.

It is forecast that the second container berth will be needed around 2015, and the third one by 2025. The port demands for years after 2015 include input and output cargoes to/from industrial activities which may take place inland in future.

In light of the existence of sufficient port capacity and wide unutilized reclamation area, it is not likely that Khasab Port will encounter shortage of port capacity within the foreseeable future. Further, unpredictable elements do exist in Khasab Port planning such as foreign country's policy on unofficial trade practice. Taking these factors into consideration, Khasab Port Development Plan for 2025 (see in Figure 9.2-7) needs not be further phased out.

11.1.5 Duqm Port

Figure 11.1-4 Duqm Port 1st Phase



Source: JICA Study Team

Duqm Port development project can be carried out in two phases. The 1st phase is to develop port facilities and dry dock facilities for ship repairing. The 2nd phase is to develop an oil refinery and storage facilities including SBM and pipelines.

The 1st phase development is shown in Figure 11.1-4, and configuration of the sub-breakwater is adjusted from the original proposal of the European consultant, taking into consideration the effects of the main breakwater. However, the sub-breakwater can be extended if necessary after monitoring the calmness of the basin and sediment movement.

The 2nd phase project to construct oil refinery and storage will require huge investment. However, once national or/and international consensus is reached, project should proceed as quickly as possible. Prior to the consensus, careful studies and evaluation on natural and environmental conditions have to be implemented. Among marine meteorological condition surveys, wave height observation is important. Soil investigation is also important to decide the suitable location for the oil refinery and storage tanks.

11.1.6 Shinas Port

Shinas Port development plan is not ambitious but rather simple. Two berths with alongside water depth of 6.5m and 4.5m each are proposed. Dredging of channel and basin is also proposed to accommodate commercial vessels. As these civil works are on a small scale, (see in Figure 9.2-11,) formation of phased development plan is not necessary for the implementation in this particular case. The project should be implemented as early as possible because the project can be considered as provision of basic infrastructure to the local people.

11.2 Assessment and Selection of Priority Projects for the Seventh Five-Year Development Plan

First phase development projects of the long-term plan of each study port were evaluated and assessed to select priority projects, which are to be incorporated in the Seventh Five-Year Development Plan. Projects which are currently part of the Sixth Five-Year Development Plan and expected to continue in the next Five-Year Plan are also evaluated in this work.

Selection criteria basically consist of the following three components and each has several elements:

Policy Consistency	i)	Economic Diversification
	ii)	Transportation Cost Reduction
	iii)	Balanced Development
Economic Justification	iv)	Continuity
	v)	Urgency
	vi)	Maturity

Environmental Considerations

Each element is evaluated using a scale of 0-3, with "3" being the highest and "0" indicating that the project has no value for a particular element. Importance of each element is not compared in the assessment; the scores are simply added up.

Resulting outcome of this assessment is shown in Table 11.2-1. Projects both at Salalah and Sohar gain high points while projects at Khasab Port and Shinas Port earn relatively low points.

Table 11.2-1 Assessment and Selection of Priority Project

Port	Project	Diversification of Economy	Transportation Cost Reduction	Balanced Development	Continuity	Urgency	Matuarity	Environment	Total
Qaboos	**Cruise Terminal***	3			3		3	2	**11**
	1st Phase	2	2			3	2	2	**11**
Salalah	**Berth No5 & 6***		2	1	3	3	3	2	**14**
	1st Phase	3	2	1	1	1		3	**11**
Sohar	**1st Phase***	3	2	1	3	2	1	2	**14**
Khasab	**Development Plan**			3				3	**6**
Duqm	**1st Phase***	1	1	3	3	1	1	1	**11**
Shinas	**Development Plan**		1	3	1		1	2	**8**

Source: JICA Study Team

Remarks: * indicates a project " Under Implementation "

11.3 Environmental and Social Considerations on the Priority Projects

(1) Explanation to and Discussions with Stakeholders

DGPMA organized stakeholder meetings to explain the possible environmental impacts of the proposed development plan of the JICA Study Team for the Sultan Qaboos Port and Duqm Port. The following Table 11.3-1 summarizes the main comments made at the meetings.

Table 11.3-1 Main Comments Obtained through the Stakeholders Meetings

Sultan Qaboos Port	Duqm Port
➢ The stakeholders suggested that a new access road should be built before starting the port development construction. This will reduce the frequency of traffic jams in the Muttrah area. This will also lead to the reduction in air and noise pollution from the project. ➢ JICA Study Team acknowledged the importance of the new access road and explained to the stakeholders that an in-depth study on the access road to Sultan Qaboos Port needs to be implemented by Ministries and Local Government concerned. ➢ The Sheikh of Aint district expressed his concern over the proposed breakwater, since its location overlaps with the gill net fishing ground of the Aint district fishermen. ➢ JICA Study Team explained to the stakeholders that the new breakwater could potentially provide new habitats for various marine species including fishery resource species. JICA Study Team also explained that deployment of an eco-friendly breakwater would enhance coral settlement, provide excellent habitat for the various marine species and benefit the local fishermen as a consequence.	➢ The Wali expressed that the establishment of the Duqm Port and the oil storage and exporting facilities will be an excellent way to promote the socioeconomic growth of the region. The local residents should appreciate such a plan. ➢ Some of the major oil wells of Oman lie in the Al Wusta Region. Establishment of oil storage and exporting facilities in the Duqm area should significantly reduce the present cost and work of transporting oil to the Mina Al Fahal. ➢ Together with the oil storage and exporting facilities, an oil reception facility should be considered as a measure to prevent illegal discharge of ballast water. ➢ Since the oil storage and exporting facilities have significant potential environmental impact, a detailed environment and socio-economic study should be implemented at the earliest possible stages. ➢ The planned fishery harbour inside the Duqm port may have to be reconsidered mainly due to the proximity to the drydock facilities (i.e. hygienic reasons). An alternative fishery harbour may have to be considered outside the Duqm port. ➢ Although the current fish landing activities at the Duqm port area may have to be relocated to another area, there are many alternative sites for fish landing in the Duqm area. For example in Ras Madraka. ➢ The current fish processing factory at the Duqm port area may have to be shifted. ➢ In the Duqm area, fishing is not conducted during the SW monsoon season (June – September). Most of the local fishermen move to the inland areas during this season to pursue other income generating activities such as date farming.

Source: JICA Study Team

(2) Implementation of Environmental and Social Considerations on the Priority Projects

Based on the collected environmental information, the environmental impacts of the priority projects were assessed in terms of the environmental capacity of the project area (Table 11.3-2). The project area is separated into the hinterland, port and coastal area.

Table 11.3-2 Preliminary Assessment of the Impacts of the Priority Projects in Terms of the Environmental Capacity of the Project Area

		Qaboos	Salalah	Sohar	Duqm
Hinterland area	Air quality	2	3	3	3
	Noise / vibration	2	3	3	3
	Water quality	-	-	-	-
	Bottom sediment quality	-	-	-	-
	Groundwater quality	3	3	2	3
	Ecosystem	3	3	3	2
Port area	Air quality	2	2	3	2
	Noise / vibration	1	2	2	2
	Water quality	2	2	2	2
	Bottom sediment quality	2	2	2	2
	Groundwater quality	-	-	-	-
	Ecosystem	2	3	3	2
Coastal area	Air quality	3	3	3	3
	Noise / vibration	3	3	3	3
	Water quality	2	3	3	2
	Bottom sediment quality	2	3	3	2
	Groundwater quality	-	-	-	-
	Ecosystem	2	3	3	2
Total		31	38	38	33

Rank 1: Likely to exceed environmental capacity, Rank 2: Likely to be within environmental capacity if appropriately controlled, Rank 3: Likely to be below environmental capacity or no impact factors

Source: JICA Study Team

The environmental capacity was more likely to be exceeded in proportion to the scale of the development and proximity to sensitive environments, which is reflected in the above results. Sohar and Salalah Port scored the highest ratings (38 out of maximum 42) mainly due to the relatively minor scale of development compared to the other ports. Sultan Qaboos Port scored the lowest rating (31 points), mainly due to the relatively large-scale development and its close proximity to sensitive environment (e.g. corals and residential area). Although the development scale of Duqm Port is the largest within the four ports, the rating was only second lowest (33 points) because the port will be located at a relatively far distance from the residential area.

(3) Formulation of Frameworks for the Implementation of Environmental Impact Assessment (EIA)

In accordance to the MRMEWR, *"Guidelines For Obtaining Environmental Permits"*, all port development projects will require an detailed EIA to obtain an Environmental Permit from MRMEWR, unless the project is considered by the MRMEWR to have a negligible impact on the environment. The following Table 11.3-3 identifies the environmental parameters that require an impact assessment for each priority project, through the utilization of a ranking system.

Table 11.3-3 Environmental Parameters that Require an Environmental Impact Assessment

Environmental parameters		Qaboos	Salalah	Sohar	Duqm
Pollution	Air quality	1	1	1	1
	Noise / vibration	1	1	1	1
	Seawater quality	1	1	1	1
	Sediment quality	1	1	1	1
	Odor	2	2	2	2
Biophysical environment	Ecosystem	1	3	3	1
	Topography / Geology	2	3	3	2
	Groundwater	3	2	1	2
	Wadi flow	3	3	3	3
	Water circulation	1	3	3	1
	Coastal erosion / accretion	2	2	2	1
	Landscape	1	3	3	1
Social environment	Livelihood / Resettlement	1	1	1	1
	Fisheries	1	2	2	1
	Tourism	1	2	3	2
	Land / water use	1	3	3	1
	Cultural assets	1	3	3	3
	Infrastructure	2	2	2	2
	Waste	2	2	1	1
Total		28	40	39	28

Rank 1: Environmental impact assessment should be conducted, Rank 2: Environmental impact assessment should preferably be conducted, Rank 3: Environmental impact assessment not required

Source: JICA Study Team

According to the results of the above Table, Sultan Qaboos Port and Duqm Port will likely require a detailed and comprehensive EIA due to the low point total. For Sohar and Salalah Port, a comprehensive EIA may not be required since the expected environmental impact is restricted to limited parameters. Still a minor EIA report may be required specifically for some parameters. However, the final decision lies with the MRMEWR.

11.4 Preliminary Engineering and Cost Estimates of Priority Projects

11.4.1 Sultan Qaboos Port

Comparative design between a rubble mound breakwater and a caisson breakwater has been conducted by the JICA Study Team. On the assumption that CORE-LOC will be applied for armour concrete blocks for the rubble mound breakwater, its weight has been calculated at 20 tons by using the Hudson Formula. A caisson breakwater comprises a rock foundation made up of rock core protected with rock armour. This foundation supports a caisson box. The weight of the caisson therefore needs to be approximately 2200 tons excluding the filling sand and cover concrete.

The caisson breakwater has little advantage in unit cost, being only 6% cheaper than that of the rubble mound breakwater. As a floating dock for caisson production will be set at the inside of the port and caissons will be placed temporarily inside the port as well, the port operation will be disturbed. It is necessary for Sultan Qaboos Port to procure a wide container yard, which will be provided by blasting of the rocky hill behind the port. Wider container yard can be provided by the construction of the rubble mound breakwater because the rubble mound type requires more rock materials than the caisson type. Local labourers are familiar with rubble mound breakwaters. Therefore, a rubble mound type has been selected for the structure of the breakwater.

A pre-cast concrete block type has been selected for the structure of the quay wall. The depth in front of the quay wall has been assumed to be 16.0 m.

Based on the above, the construction period has been estimated at approximately 3 years.

The occurrence of calm conditions in the port area, where wave height is below 0.5 m, has been calculated at about 95% based on the Master Plan Study (JICA, 1990). As there is very little wave data, waves have also been predicted by means of the SMB method by using wind data observed at Seeb Airport; calmness has been confirmed to be about 95%. However, considering the scale of the port development, the base data is not adequate to finalize the layout of the breakwater. Wave observations at the proposed site of the breakwater should be carried out for at least one year. Based on observed data, the effectiveness of the proposed breakwater layout should be verified by model testing. It is desirable that the breakwater should be extended further, if necessary.

11.4.2 Salalah Port

Bulk berths 30&31 have been planned to be converted to container berths. The landside crane base will be required for the container crane. Pre-cast concrete block type has been selected for the structure of new bulk and passenger berths with reference to the structural design at berths 1-6. The depth in front of the quay wall has been determined to be 16.0 m and 10.0 m, respectively.

The existing oil jetty is located at the site of the future passenger berth, beside new bulk berths. It will be necessary to abandon the existing oil jetty and to construct the new oil jetty to the rear of the new breakwater considering the safety of port operation. As for the passenger terminal building, it needs to

express a sense of being a symbol as an “entrance”. This work should be started as soon as possible, because it will take a long time to develop this image.

Considering the different design procedures, the implementation program can be separated into two, one for the container yard at berths 30&31 and the new bulk berths, and another for the oil jetty and the passenger berth. The construction period has been estimated at approximately 3.3 years for berths 30&31 and new bulk berths and 2.5 years for passenger berth and oil jetty.

11.4.3 Sohar Port

Pre-cast concrete block type has been selected for the structure of the quay wall because it was applied for the berth structures that have already been constructed. The depth in front of the quay wall is determined to be 16.0 m, the same as that of the existing berths. It is assumed that a belt conveyer will be equipped from the berth directly to the production plant in the bulk berths. It is necessary for the container berth to provide a container crane base. Steel pipe piles with a diameter of 800 mm are to be driven at intervals of 5.0 m.

As the original area is very shallow, a significant soil volume has to be dredged. It has been estimated at 18.0 million m^3. As there will be, however, no onshore dumping area except for the onshore dumping area framed by the temporary revetment with its capacity of 2.0 million m^3, dredged material of 16.0 million m^3 has to be dumped offshore. It is assumed that the dumping area is 20 km offshore in accordance with the EIA report (WS Atkins, 1999). In order to mitigate the environmental impact on marine ecology around the dumping area by dumping dredged materials, and to utilize dredged materials effectively, a temporary revetment will be constructed between the bulk berths and the container berth, and some dredged materials which are suitable for reclamation will be discharged into it.

The construction period has been estimated at approximately 2.5 years.

There is a problem of beach erosion in the northern part of Sohar Port. This problem may be caused mainly by the construction of breakwaters. Accordingly, the dredging of the inside of the basin will not have a great influence on beach erosion.

11.4.4 Duqm Port

With reference to the Feasibility Study (Haskoning, 2004), rubble mound type has been selected for the structure of the breakwater, and pre-cast concrete block type has been selected for the berth structure. The weight of armour concrete blocks is calculated at 10.0 tons using CORE-LOC and their slope is to be 1 to 1.5.

The port development at Duqm will require significant dredging volume, which is estimated at 13.0 million m^3. Once the breakwaters provide the appropriate calmness, the dredging work will begin. Most of the dredged materials are expected to be unsuitable for reclamation because they are too fine. A consultant named Haskoning proposed not offshore but onshore dumping to minimize the project cost. A cutter suction dredger will be suitable for the dredging work.

From the site reconnaissance, there is only a narrow and dirt road connecting the main road and the port. It is necessary at the beginning of the construction to prepare a wide road with satisfactory bearing capacity in order to provide access for heavy construction machinery and materials. At the detailed design stage, additional soil investigations around the access road should be carried out.

According to Haskoning, the nearest quarry site for rock material is located around the mouth of Wadi Darqast, 20km from Duqm Port. The implementation program will be influenced by the breakwater construction and its related quarrying operations. Therefore, it should be confirmed whether those quarries can provide enough volume and quality of rock materials to construct the breakwaters. The construction period has been estimated at approximately 3.3 years.

The sub-breakwater is about 300 m shorter than that proposed by Haskoning because the capital cost would be minimized by the reduction. The depth at the edge of the sub-breakwater is planned to be -6.0 m. If sedimentation occurs or the required calmness can not be obtained, the breakwater could be extended.

The results of the cost estimate for four priority projects are summarized in Table 11.4-1. The annual maintenance cost does not include the renewal cost of equipment.

Table 11.4-1 Summary of Capital Cost and Annual Maintenance Cost

	Public Sector		Private Sector	
	Capital Cost	Annual Maintenance Cost	Capital Cost	Annual Maintenance Cost
Sultan Qaboos Port	61.00	0.10	26.00	0.70
Salalah Port	43.00	0.00	28.00	0.80
Sohar Port	47.50	0.20	10.50	0.20
Duqm Port	76.50	0.14	2.50	0.17

Unit: R.O. million
Source: JICA Study Team

11.5 Management, Operation and Financing Scheme of Priority Projects

11.5.1 Sultan Qaboos Port

Present Concession Agreement shall terminate at the end of 2006. In order not to interrupt operation in the transition period of the contract, it will be justifiable that GSO renews concession to PSC. Under the business environment of the port and the country, it is reasonable to continue the arrangement in terms of investment of GSO and PSC. Following issues in terms of PSC's practice should be considered:

(1) Expediting Decision Making

Decision process of the Board and the Committee is cumbersome and time-consuming. Only by balancing a bold and cautious approach can be enhanced while ensuring a financially sound port. It seems that PSC is tilting towards a cautious approach at this moment, but in light of good financial results in recent years it may be a good time to adjust the tilt.

Following arrangements are recommended to improve the decision-making process.

1) The president = CEO should be a member of the Board, or even the chairman like at many other organizations
2) Signature of each member is a redundant requirement. A record of decision is sufficient for keeping corporate governance.
3) Auditing Committee abolishes the practice of intervening in the process of individual tenders.

(2) Proper Manning

The number of employee has been falling since 1999 to 11% smaller than in 1999. PSC accepted the main recommendations of the study by Moore Stphense/Hyder, and is implementing measures to reduce manpower requirements such as introduction of new IT network, development of staffs' multi-task skills. It also recommends increasing manpower on the front line by more than 100 workers to solve the labour shortage.

(3) Customers' Satisfaction

Generally speaking, the potential of the port is not being fully utilized. PSC's attitude for investment should be more customer oriented.

11.5.2 Salalah Port

Concession Agreement with SPS shall last until 2028. The following issues need to be addressed.

(1) Fair Sharing of Profit

The Government has granted a further five year exemption of income tax. Considering SPS's financial performance, and in view of covering the Government's huge investment in infrastructure, the

Government should try to levy income tax as soon as possible.

(2) Cultivating New Clients

According to the record in the summer of 2004, about 77% of container vessels calling the port were Maersk. The line line's frequent changes or cancellations of the schedule makes it difficult for other shipping lines to make a reservation, and some shipping lines are hesitant to call Salalah. To attract other shipping lines, it will be necessary to provide evidence of fair berth assignment. Expanded clients will contribute to the activation of business in the region.

(3) Protecting National Interests

Multi-purpose berth and the bulk berths are occupied by container feeder vessels. Considering that GSO is making a huge investment in infrastructure of Salalah port, requests by local exporters should be accommodated in the port operation.

11.5.3 Sohar Port

SIPC, the 'landlord' type managing body of the port, very recently began operations after entering into contracts of cargo handling and marine services with companies abroad. At this stage, there is no reason to change the port managing body or the operation scheme. According to the terms of the existing concession agreement, after 2007, GSO will not bear the investment cost, however private sector would not be able to raise sufficient funds for the planned infrastructure building. GSO should continue to invest in basic infrastructures until such time the port generates sufficient revenue from its activity for recovering the cost.

11.5.4 Duqm Port

Duqm port is a 'greenfield port', but the hinterland is very sparsely inhabited and no industries are located. GSO intends to provide a port and other infrastructures, and to award a concession to interested industries. SIPC type (landlord) port authority is tentatively being considered as the managing body.

11.5.5 MOTC

1) As a short term measure, it is recommended that the position of an Assistant DG for Maritime Affairs be newly created to represent MOTC in international maritime forums.
2) To keep pace with the latest information technology, MOTC/DGPMA should hire an IT expert and assistants as the first step.
3) Qualified experts are extremely limited in the port sector of DGPMA, in particular at Headquarters. The sector should be strengthened by hiring qualified people to fill the following positions;

Port technical staff (including Head of Department and Division Chief) … 10-13, IT expert …2, Technical inspector…1, Statistics…1, Legal and Administrative Advisor…1, Total… 15-18.

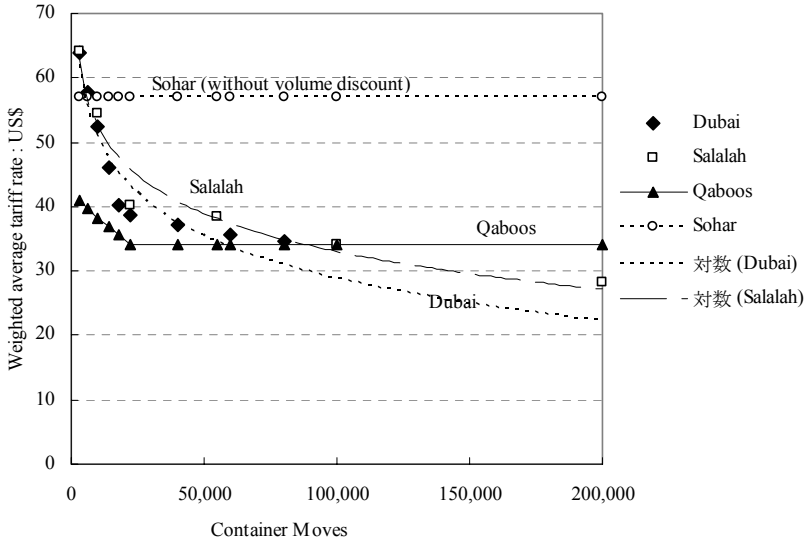
12 PRELIMINARY ECONOMIC AND FINANCIAL ANALYSIS OF THE PRIORITY PROJECTS

12.1 Examination and Evaluation of Tariff and Concession System

(1) Comparison and Transportation Cost and Port Tariff

In order to compare at effective level of port charges, weighted average charges are calculated including discounted rate. It is recognized that the Salalah and Dubai is in the similar level of charges whereas Qaboos is low in small volume but high at large volume. There must be a possibility Qaboos port also apply similar tariff structure in order to compete with other ports and yet making reasonable profit from small cargo suppliers.

Figure 12.1-1 Weighted Average Container Handling Charges in the Four Ports



Source: JICA Study Team

There is a fact that the cargo imported through Omani ports is 2.1 million tons which corresponds to only 44% of total import and others through Dubai and other cities in UAE. The reason for this cargo flow is because of the business magnitude far larger in Dubai than in Muscat. In terms of tariff rate and transportation cost in total, cargo of final destination to Muscat is cheaper through Sultan Qaboos Port, but the frequency of vessel calls and volume discount to agents made Dubai very competitive.

Current freight rate of containers from Asia to Sultan Qaboos Port is higher by US$100/TEU than that to Dubai. This is because Sultan Qaboos Port accommodates only feeder vessels from Dubai, thereby additional cost is incurred.

Table 12.1-1 Transportation Cost Compared (based on interview survey)

From	Size	To Dubai (in US$)	to Muscat (in US$)	Cost (Muscat – Dubai)
Freight from Singapore	40'	1,500	1,700	200 (100 /TEU)
Port Charges	40'	168	149	-19 (-10 /TEU)
Truck charges	40'	350	130	-220 (-110 /TEU)
Total	40'	2,018	1979	Muscat cheaper by 39$/FEU (20$/TEU)

Source: Interview survey by the JICA Study Team

As a result of combination of freight charges and land transportation cost, importation through Sultan Qaboos Port has some advantage. It is important to apply volume discount for major port users according to negotiation individually.

(2) Examination of Concession System and Profit Sharing

Under the current agreement, the Government constructs the infrastructure and terminal operator, as concessionaire, prepares equipments. Revenues are distributed to each party according to the agreement in four items, namely 1) Rent payment to the government, 2) Income tax payment, 3) Dividend for the share capital, 4) Payment to the Government as profit sharing after deducting reasonable amount to shareholders.

Table 12.1-2 Profit Sharing of Salalah

year	2000	2001	2002	2003
Dividends Paid (from net profit)	0	0	0	180,557
Profit sharing (franchise fee)	0	0	246,002	935,351
Rent	397,520	409,446	421,729	434,381
Tax	0	0	0	0
Government Revenue	**397,520**	**409,446**	**667,731**	**1,550,289**
Share of net profit	17%	18%	22%	28%
Operation Cost Before Rent payment	16,219,213	14,699,677	13,817,166	12,504,231
Profit of SPS before rent and royalty payment	-2,385,839	527,238	2,020,005	5,451,774
Dividend + Management Fees to AP Moller	**0**	**608,780**	**732,523**	**1,642,617**
Share of net profit	0%	27%	24%	30%

Source: JICA Study Team

The calculation indicates that the share of the government has started from 17% from the early stage of the operation and reached to the level of 28% in 2003. On the other hand the share of AP Moller started 0% and has reached 30% in 2003. In other words, AP Moller-Maersk Group took high risk for the development of Salalah and now getting the return and realizing benefit. Therefore it is natural that they begin to take larger share as a group. Admitting this fact it is important to consider the future development burdens and shares of the benefit.

Based on the concept to secure the minimum return for the repayment of loan for the breakwater construction, it might be expected to charge the additional cost by each container handled, which amounts to 0.9 RO/TEU.

Even though the government appreciates the performance of the SPS and its quick development as international container hub, the study result indicates consideration on the tax payment to be resumed. For comparison, share of Government and PSC at Sultan Qaboos Port is exhibited.

Table 12.1-3 Cost and Profit Share of one Container at Sultan Qaboos Port

	Year 2003	
Government share of profit (RO/TEU)	49.6	24%
PSC Share: retained earnings and dividend to shareholders other than Government (Profit / TEU)	33.7	16%
Operating cost (RO/TEU)	122.4	59%
Revenue per TEU (RO/TEU)	205.7	100%

Source: JICA Study Team

12.2 Overview of Financial Situation of Project Implementation Bodies

(1) Port Services Corporation SAOG (PSC) at Sultan Qaboos Port

1) Financial standing of PSC

Unit revenues and costs are calculated from the financial statement and confirmed that these unit revenues and costs are constant during the past four years. Based on the analysis, following unit rates are determined as component of business structure of the port of Sultan Qaboos, and will be applied to the calculation of revenue and cost for the future activities.

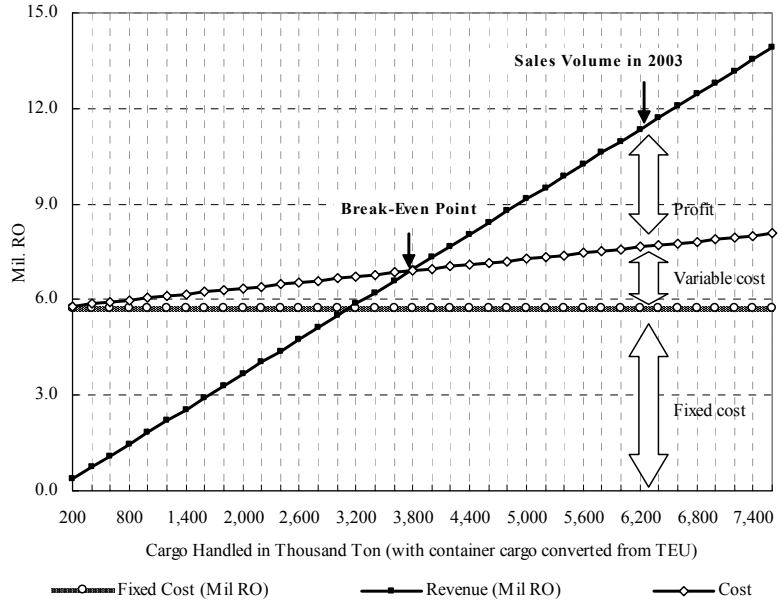
Table 12.2-1 Unit Revenue and Cost of Sultan Qaboos Port in 2003

Non container cargo: Revenue (including vessel charges & stevedoring)	2.20	RO/Ton
: Variable Cost	0.22	RO/Ton
Container cargo: Revenue (Import/Export container)	26.4	RO/TEU
Revenue (Transhipment container)	7.5	RO/TEU
Variable Cost (RO/TEU)	4.82	RO/TEU
Fixed Cost (Including Personnel cost, rent etc)	5.74	Mil RO

Source: JICA Study Team

Using the numbers in the unit revenue and cost, Break-even analysis is exhibited in the following graph. The cost in the graph does not include payment of profit sharing to the government by the name of "franchise fee" because it is paid from operating profit.

Figure 12.2-1 Break-Even Analysis of Sultan Qaboos Port (RO) in 2003



Source: JICA Study Team

As shown in the graph, break-even sales amount is 3.8 million ton/year. Sales in 2003 being 6.3 million ton gives break-even ratio as 60% which is very good for making profit by operation.

2) Fund Availability of PSC

Sultan Qaboos Port is operated with sufficient fund and generating good amount of surplus without loan as is seen in the next table. The operating cashflow is steadily growing, but the Asset amount of "property, plant and equipment" is declining. The content of investment is not on the operational facilities but on stock market. Even after investing money on securities, fund available for new investment is plenty.

Table 12.2-2 Cashflow Composition and Related Information

	1,999	2,000	2,001	2,002	2,003
Operating Cashflow	837,217	456,984	3,022,027	2,921,022	3,369,699
Investing Cashflow	313,358	447,396	326,800	-1,674,727	-1,232,569
Financing Cashflow (mostly Dividend)	-1,097,500	-917,500	-2,998,228	-1,296,000	-1,800,000
Addition to Cash deposit	53,075	-13,120	350,599	-49,705	337,130
Cash at year-end (incl. S.T.Deposits)	**4,437,837**	**4,424,717**	**4,775,316**	**4,725,611**	**5,062,741**
Property, plant and equipment(asset value)	**9,763,230**	**8,981,990**	**8,239,469**	**7,771,143**	**7,420,879**

Source: PSC Annual Reports modified by JICA Study Team

(2) Salalah Port Service Co. SAOG at Salalah Port

1) Financial standing of SPS

Similar to the case in Sultan Qaboos Port, unit revenue and cost are calculated and shown in the table below. The unit profit per TEU is also in the table in order to understand the business structure of the port.

Table 12.2-3 Unit Revenue, Cost and Profit by Cargo Type (unit R.O.)

	2000	2001	2002	2003
Container Cargo				
Total TEU	1,032,846	1,187,753	1,258,608	2,001,259
Revenue (RO/TEU)	**11.6**	**11.4**	**11.2**	**10.1**
Cost (RO/TEU)	8.2	9.1	8.5	7.5
Profit (RO/TEU)	3.3	2.3	2.6	2.6
General Cargo				
Total tonnage (Bulk & General)	1,049,322	1,401,573	1,677,916	1,342,577
Revenue (RO/Ton)	2.5	1.5	1.5	1.3
Cost (RO/Ton)	2.3	1.1	1.1	1.1
Profit (RO/Ton)	0.22	0.37	0.38	0.15

Source: SPS Annual Reports arranged by JICA Study Team

In the Salalah port, 95% of activity is container cargo handling and the rest of non-container cargo is largely fuel import and cement export. Unit revenues and costs shown in the table indicate both are slightly declining but not much. As a result, unit profit of container remains the same. Based on these analyses, following unit rates are determined as component of container handling business structure of the Salalah port, and will be applied to the calculation of revenue and cost for the future activities.

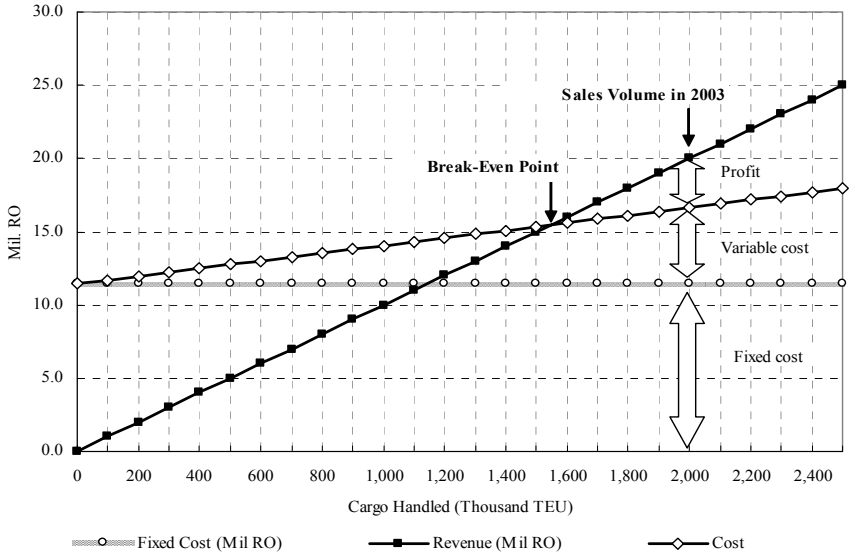
Table12.2-4 Unit Revenue and Cost of Salalah Port Container Handling in 2003

Unit Revenue by Container (including vessel charges & stevedoring)	10.0	RO/TEU
Unit Variable Cost of Container Handling (RO/TEU)	2.6	RO/TEU
Fixed Cost (Including Personnel cost, rent etc)	11.45	Mil RO (5.7RO/TEU)

Source: JICA Study Team

Using the numbers in the unit revenue and cost, Break-even analysis is made in the following graph. Salalah Port Service (SPS) has high fixed cost as against that of Sultan Qaboos Port. But the cargo volume is high. Break-Even sales amount being 1.55 million TEU and sales amount of 2 million gives the break-even ratio as 77%, which is good indication that the profit earning structure is sound and strong enough to produce cashflow for the continuing investment.

Figure 12.2-2 Break-Even Analysis of Containers at Salalah Port (2003)



Source: JICA Study Team

2) Financial capability of SPS

Reviewing the cashflow since the beginning of operation, the growth of SPS is reflected in the growing number of operating cashflow. It is negative in the first two years and it turned positive after the years 2000. Free cashflow also turned from negative to positive after the first four years of operation. Similarly, Debt Service Coverage Ratio grows to be more than 1.5 in 2000, and reached the level of 3.0 in 2003. The concept of this indicator is to check the repayment ability by the operation of business, and 1.5 is regarded as minimum requirement.

Table 12.2-5 Cashflow Summary at Salalah Port

	1998	1999	2000	2001	2002	2003
Operating Cashflow	-780,540	-541,221	6,381,941	6,393,453	7,043,210	10,197,936
Investing Cashflow	-17,964,397	-13,799,120	-8,010,503	-14,734,808	5,976,798	-7,100,807
Free Cashflow	**-18,744,937**	**-14,340,341**	**-1,628,562**	**-8,341,355**	**13,020,008**	**3,097,129**
Cash at the end of the year	2,344,617	476,239	-84,235	1,680,257	5,847,113	4,649,245
Total debt service (Intst & Repayment)	-1,777,132	-1,887,147	-3,846,449	-4,156,592	-9,491,422	-3,395,810
Debt Service Coverage Ratio	-0.44	-0.29	1.66	1.54	0.74	3.00

Source: SPS Annual Reports arranged by JICA Study Team

SPS is in the quick growing stage in order to compete with international container transshipment market, capital investment is important in the coming several years as well as annual financial performance. Stage by stage development and skillful strategy to attract transshipment cargo secures the development of SPS, and strong capability of management will secure the future development.

12.3 Financial and Economic Analysis of the Priority Projects

Based on the break-even analysis, unit revenue, unit operation cost and itemized fixed costs are calculated at each port. It should be noted that record in the past 5 years proved these unit information to be fairly constant, therefore it is reasonable to use for the future projections. The future estimation of revenue and operation cost is calculated by multiplying the unit values with future cargo throughput.

For the Sultan Qaboos Port, priority project is an expansion of container terminal, so that container related revenues and costs are prepared. Priority project at Salalah port deals with both container and conventional cargo. Based on the actual record, unit revenue for container cargo and that for conventional cargo is prepared. For the estimation of other ports, unit data for the calculation of future account is prepared based on the assumption similar to those of Sultan Qaboos Port considering the similarity of situation in each case.

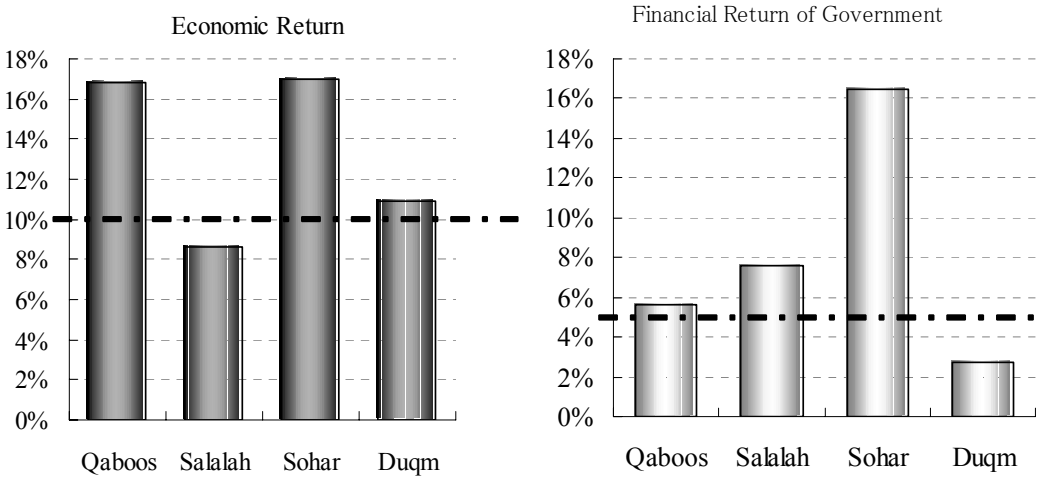
12.4 Preliminary Evaluation of Priority Projects from Economic and Financial Perspectives

As a result of the feasibility study for priority projects, returns on investments are exhibited in the following graph in which IRR on government investments should be compared with the hurdle rate of 5%, and the IRR on operator should be compared with the hurdle rate of 15%. As for economic returns, 10% is considered as hurdle rate considering the impact on wide range of public and long duration of project life cycle.

In most projects such as Qaboos, Salalah and Sohar, government will receive the return more than the hurdle rate, but Duqm does not have sufficient return. Duqm port is weak in financial background, but economic effect is expected to be larger than the financial return, thereby the project is justified to receive continuous support of the government.

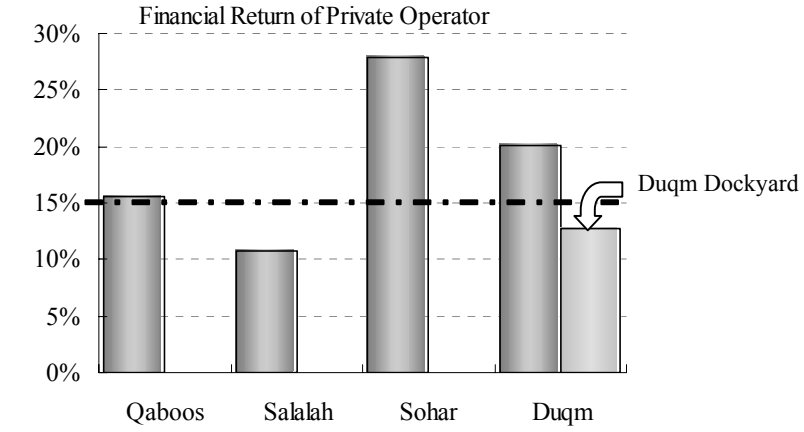
By a close look, Salalah and Sultan Qaboos ports are less or only slightly over the hurdle rate because of the investment on the breakwater. However costly, large cargo demand expected to the newly developed part of port, these projects have significant impact to the future.

Figure 12.4-1 Summary of Return on Public Investment at Priority Projects



Source: JICA Study Team

Figure 12.4-2 Summary of Return on Private Investment at Priority Projects



Source: JICA Study Team

Financial returns on the investment of private sectors in priority projects are in the level above the hurdle rate of 15% except Salalah. It is, therefore in short, Qaboos and Sohar is feasible, and Salalah depends on the risk taking effort of SPS, and Duqm depend on the government support after the opening of the port.

Besides economic and financial feasibility study, integrated analysis including socio-political viewpoints is important. Sultan Qaboos Port needs to be developed as gate port to the nation and the development of container terminal is a must for the future of the port. Salalah port already established its reputation as an international container transshipment hub and its development is ardently wished by users as international economy grows. Sohar and Duqm Ports are strategically planned and their success is hoped for the regional and industrial development.

Lastly, marketing risk in relation to cargo fluctuation needs to be considered. Sultan Qaboos Port is supported by the growing demand of import cargo to Muscat, therefore the risk is small. Salalah is

dealing with international transhipment containers, which are quick to move to other ports unless the service satisfies the expectation. Any delay of construction of the new terminal will seriously damage the future profit, but this risk is offset by the Maersk-Sealand as the main client who has a largest international container trade.

Sohar assumes to deal with import and export of hinterland industries, thereby stable as long as those industries are in good operation, therefore the risk seems to be reduced once the industry start operation.. For Duqm Port, substantial amount of investment is necessary to induce vessel and cargo. Therefore it is somewhat risky, and reasonable amount of investment is indispensable for the upgrading the image of the region.

13 DRAFT GUIDELINE FOR SEVENTH FIVE-YEAR DEVELOPMENT PLAN OF PORT SECTOR

13.1 Review of the Port Sector Plans in the Previous Five-Year Development Plans

During the period of the 4th Development Plan (1991 – 1995), a total of O.R. 26.3 million was allocated to the Port Sector as development expenditure including for ongoing projects from the 3rd plan. Majority of the budget was spent on projects to expand the capacity of Sultan Qaboos Port, and on the construction of the Royal Yacht berth. Improvement of the managerial efficiency of ports was one of the goals to be achieved during the 4th Five Year Plan period.

At the beginning of the 5th Five Year Plan (1996 – 2000), O.R. 3.5 million including the budget for the ongoing projects was allocated to the Port Sector. New main projects were civil works for maintenance and renovation of jetties in Khasab Port (O.R. 1.5 million) and Raysut Port (O.R. 1.0 million). At a later stage of the Five Year Plan period, however, budget of O.R. 52 million for construction of container berths (No.1 – 4) at Salalah Port was appropriated. Industrial Port Development Project at Sohar was also approved officially later in 1999, and the amount of O.R. 96 million was capitalized for this project although most of it was carried over to the 6th Plan. Supplementary budget for these new projects reached O.R. 166.7 million. In the 5th Five Year Plan, Port Sector put the emphasis on private sector's roles in port construction and operation.

In the 6th Five Year Plan (2001 – 2005), about O.R. 5.2 million are approbations for new projects which include establishment of a free trade estate in Salalah at a cost of O.R. 2.5 million. Most of the approved budget for the Sohar Industrial Port is transferred from the previous plan. In addition to these projects, establishment of Duqm Port at a cost of O.R. 20 million was approved, and a project to extend the container berths by 900m at Salalah Port was also approved recently. In total, approved development expenditure for the port sector reached nearly O.R. 200 million in the 6th plan. Reorganizing the administrative framework for ports authority is one of the objectives of the port sector in the 6th plan.

13.2 Preliminary Evaluation of the Sixth Five-Year Development of the Port Sector

(1) Administration, Port Management and Operation

During the Sixth-Five Year Development Plan, port management system in the major ports witnessed remarkable development. Sultan Qaboos Port has been greater private sector participation. Salalah port has been earning a net profit since 2000. Sohar Industrial Port Company (SIPC) was established at the time of the completion of the first phase construction. Private sector participation in port operations has gained steady progress.

(2) Infrastructure Development

1) Port traffic

Omani ports registered a total of 1.9 million tons of export/import cargo in 1995, 2.9 million tons in 2000, and 3.6 million tons in 2003, yielding an annual growth rate of 7.9 percent during the period from 1995 to 2000 and 8.3 percent during the period from 2000 to 2003. Regarding the transhipment container throughput at Salalah Port, 2 million TEUs was registered in 2003 while 1 million TEUs was recorded in 2000. Resulting annual growth rate is 24.7 percent.

2) Overall contracted ratio

The ratio of the total actual expenditure to the budget is around 20% in January 2005. The actual contracted ratio to the budget is still low in each port except for Shinas Port where more than 90% of the allocated budget has been implemented. However, it is hoped that the execution ratio will increase gradually. Regarding the Duqm Port development project, it is still at the study stage, and likely to be carried over into the next Seventh Five-Year Plan.

13.3 Cargo Demand for 2010 and Existing Capacity

For Sultan Qaboos Port, container traffic, both import/export containers and transhipment containers, is expected to continuously increase and will reach more than 400,000 TEUs in 2010, which is 52% larger than that in 2003. As existing capacity of Sultan Qaboos Port is estimated at around 300,000 TEUs, the forecast container traffic cannot be accommodated at the Port unless additional facilities are constructed by 2010. Regarding the conventional cargo, no major problems are foreseen because cargo demand of this type is rather stable or moderate in the coming years.

For Salalah Port, container traffic is likely to exceed 3 million TEUs in 2010 while existing capacity is about 2 million TEUs. In order to cope with ever-increasing container traffic, the government approved the expansion project and the 900m long new berths will be commissioned in 2007. After the expansion project, Salalah Port will have an annual container handling capacity of over 3 million. Regarding the conventional cargo, there is a possibility that capacity for dry bulk cargo will be in short if No30 and No.31 berths are utilized for container handling.

Industries at Sohar Port will start operation in 2006 at earliest and 312,000 TEUs are expected to pass through Sohar Port in 2010. In addition, nearly one million tons of break-bulk cargo and about 4 million tons of dry bulk cargo are also forecast to be handled at the port in the same year. As existing multi-purpose berths with 700m in length will accommodate only about one million tons of break-bulk cargo, construction of new bulk and container berths are to be realized at the early stage.

13.4 Draft Objectives of the Port Sector in the 7th Five-Year Plan

After evaluating the past performances of the port sector and foreseeing the future expectations toward this sector, following draft objectives can be proposed;

1. Creating within MOTC the Port Planning Council consisting of the representative from relevant government agencies and private sector, for the purpose of establishing the administrative framework adequate for planning, coordinating, marketing and administering port with a view to achieving long-term port development.

2. Establishing information and data collection/processing system of port and maritime sector in the administration as well as in the related private sector, extensively utilizing Information Technology.

3. Streamlining decision-making procedures in the administration, as well as in the port authorities, so as to respond to the challenge of global maritime market.

4. Reviewing the demarcation of investment between the government and the private sector for future development of major ports, and establishing adequate scheme of investment for each port.

5. Reviewing the terms of the Agreement of Sultan Qaboos port that shall expire at the end of 2006, and deciding the management of the port as soon as possible with the view to maintaining continuous operation during the transition period.

6. In view of low profitability of the ports and reducing the operational burden of the government, entrusting the management of the Shinas and Khasab ports to a private operator with operational subsidy.

7. Privatization of Duqm port after attracting a company that can manage the entire port and its attached industry area through long term concession agreement

8. Expansion of port capacities so as to meet the ever-increasing cargo demand which will be necessarily generated in correspondence with not only the government economic development policies but also global economic development scheme.

9. Promotion of the economic diversification policy. Diversification of the national economic structure will affect the port activities by realizing a variety of port traffic. For example, tourism development policy will require a cruise terminal at the prospective ports.

10. Realization of portside industrial zones. Port areas are ideal positions for industrial activities because they are transition points between land and maritime transportation. Industrial activities are expected to be commissioned at Sohar and Salalah during the 7th Plan.

11. Balanced development and reduction of discrepancy among regions are important government targets to be achieved. Duqm falls into this category and a port should be developed as a basic infrastructure through which everyone can benefit. .

12. Exploration of Future Potential of the Port Sector
Exploration of the future need of the sector is a must of its sector in every Plan. Evaluation

and selection of the best location for new port should be studied from social, economic and environment aspects. Future potential of Duqm and Musandam need to be carefully evaluated.

13.5 Ports Sector Investment Programme in the 7th Five-Year Development Plan (2006-2010)

The important projects expected to be implemented in the 7th Five-Year development Plan are categorized into three groups: construction works, information system, and studies (see Table 13.5-1). Required investments by the private sector are also listed for reference in the Table.

Promotion of export oriented non-oil industries will be achieved by promoting of industrial port development at Sohar, activation of EPZ at Salalah through expansion of its container terminal as well as general cargo facilities. Promotion of tourism development through building cruise terminals at Sultan Qaboos Port and Salalah Port is another effective way to achieve the goal.

Duqm port development will be one of the key projects to achieve the balanced development of the nation and also effectively promote diversification of industries. The ship yard will require not only physical facilities but also need miscellaneous supporting industries and human resources.

Expansion and improvement of Sultan Qaboos Port is contemplated as one of the most effective projects to improve accessibility to the foreign market. By this project, a part of trade now relying on UAE ports will be switched to Sultan Qaboos Port and the project will effectively enhance local commercial activities as well as promote local employment. This project will also reduce overall transportation cost for trade cargo and will be useful for stabilizing consumer prices in the country.

In order to increase private sector participation in the port related industries and business, improvement of business environment in Oman is required. In this respect, introduction of IT system throughout the country will effectively improve efficiency of business transactions.

Future need of the port sector should be explored and studied from the view points of long term development and perspectives. Selection of the best location for the development of a new port to promote and enhance the national policies should be. Future potentials of dispersed populated regions such as Al Wusta and Musandam be carefully evaluated.

Within the Seventh Five-Year Plan, the private sector is expected to invest a large amount of port super-structures as shown in Table 13.5-1. With regards to the port infra-structures, however, direct investment by the private sector is not expected because almost all the port infrastructures in the competing ports in the region are developed by the public sector.

Table 13.5-1 Investment Plan for Port Sector Development in the Seventh 5-Year Plan

(Unit: RO. Million)

Type	Port	Project	Sector	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Construction Works	**Sultan Qaboos**	**Cruise Terminal**	Public	0.55					0.55
			Private						0.00
			Sub Total	0.55	0.00	0.00	0.00	0.00	0.55
	Sultan Qaboos	**Outer Harbor (Phase I)**	Public	0.31	8.60	20.82	25.33	5.93	60.99
			Private	0.59	0.29	0.00	0.00	24.94	25.82
			Sub Total	0.90	8.89	20.82	25.33	30.87	86.81
	Salalah	**No.5 and 6 Berths**	Public	49.31	5.08				54.39
			Private	0.00	20.06				20.06
			Sub Total	49.31	25.14	0.00	0.00	0.00	74.46
	Salalah	**2nd Phase**	Public	0.34	12.60	14.22	13.62	1.93	42.72
			Private	0.84	0.02	0.00	1.28	25.81	27.94
			Sub Total	1.18	12.62	14.22	14.89	27.75	70.66
	Sohar	**Container and Bulk Berths**	Public	0.37	16.39	20.43	10.29		47.48
			Private	0.31	0.00	0.00	10.07		10.38
			Sub Total	0.68	16.39	20.43	20.36	0.00	57.86
	Duqm	**1st Phase (Berths & Dock)**	Public	3.12	2.17	18.43	32.70	20.01	76.43
			Private	0.04	0.04	0.00	0.00	2.37	2.44
			Sub Total	3.16	2.21	18.43	32.70	22.38	78.88
	Shinas	**Channel and Berths**	Public	0.08	3.82				3.90
			Private						0.00
			Sub Total	0.08	3.82	0.00	0.00	0.00	3.90
EDI	**Nationwide**	**EDI**	Public	1.00	0.46				1.46
			Private						0.00
			Sub Total	1.00	0.46	0.00	0.00	0.00	1.46
Studies	**Khasab**	**Canal (Feasibility /S)**	Public	0.08					0.08
			Private						0.00
			Sub Total	0.08	0.00	0.00	0.00	0.00	0.08
	Duqm	**2nd Phase (Feasibility/S)**	Public	0.15					0.15
			Private						0.00
			Sub Total	0.15	0.00	0.00	0.00	0.00	0.15
	New Port	**Feasibility Study**	Public	0.20					0.20
			Private						0.00
			Sub Total	0.20	0.00	0.00	0.00	0.00	0.20
	TOTAL	**All Projects Above**	Public	55.52	49.12	73.91	81.94	27.87	288.35
			Private	1.77	20.41	0.00	11.35	53.13	86.65
			Total	57.29	69.53	73.91	93.28	80.99	375.00

Source: JICA Study Team