

GOVERNMENT OF PAKISTAN
PLANNING AND DEVELOPMENT DIVISION
NATIONAL TRANSPORT RESEARCH CENTRE
ISLAMABAD

387-137924

OSM

1979

07124

A NATIONAL PORT POLICY

NTRC-32

Dr. R.D. Osmers
Adviser Shipping

30th May, 1979

1. I N T R O D U C T I O N :

I. 1. In 1980 Karachi, upto that time the only seaport in the region, will be joined by Port Qasim to serve the maritime import and export requirements of Pakistan and Afghanistan.

A close coordination between the two ports is essential to assure an efficient utilisation of the facilities, through a rational division of the workload and the avoidance of wasteful duplication of services.

1. 2. In April 1979 the National Transport Research Centre prepared a draft report describing present and projected maritime cargo throughput of the region, port developments required to cope with cargo volumes and changing technologies, and proposing the establishment of a Pakistan Port Authority to provide the desired coordination between Pakistan's two ports.

1. 3. Copies of this draft report have been sent on 24th of April to the Chairman of Karachi Port Trust, Port Qasim Authority, Pakistan National Shipping Corporation, National Logistics Board and the Director General of Ports and Shipping Wing, Ministry of Communications with the request to send comments, if any, before the 20th of May, 1979.

1. 4. In this present final report , all comments received have been incorporated. No comments have been offered by KPT and N.L.B., and it is therefore presumed that they concur with the findings.

2. MARITIME THROUGHPUT:

2.1. Liquid Bulk Cargoes:

The through-put of these cargoes has increased during the past 12 years with a yearly average of 5-6%, mainly on account of growing import and export of oil products.

The imports of crude oil(transported in the larger tankers), at an average of about 3.2 million tones per year, has shown little change during this period.

Oil pier Nr.4, with a depth of water of 40 ft. can accommodate tankers of 40-50,000 DWT. Handling one tanker per day and assuming occupancy of 75% the yearly capacity would be more than 12 million tons, which would be amply sufficient for all future crude-oil import requirements.

To make Karachi accessiable for larger tankers upto 75,000 DWT would require additional dredging of the external approach channel and lower harbour to a depth of at least 45 ft.

The transport in larger tankers gives a reduction in freight charges but, in view of the short distance from the Gulf (1,000 miles, as compared to a world-average transport distance for oil of 5,800 miles) the saving would be limited to about \$ 3- million per year. It has to be seen if this would be sufficient compensation for the cost of the additional capital-and maintenance dredging.

In any case, if in future an oil terminal with deeper draft is required it would be more economical to situate this terminal where deep water is available, f.i.e at the Southern tip of Bundar Island where draft is sufficient for 75,000 DWT tankers.

2.2 Dry-Bulk cargoes for steelmill(iron ore and coal):

These cargoes will be handled at a specialized terminal in Port Qasim. When the steelmill is in full production the throughput will be 3-4 million tons per year; the potential capacity of the terminal is twice as much (according to Proforma PC.1 "Steelmills terminal", March, 1979 : 6.9 million tons).

2.3 Other dry cargoes:

On bulk cargoes which are handled fully mechanized through silos the throughput can easily be 10,000 tons per day or say 2.5 to 3.- million tons per year (at 70-80% berth occupancy). P.Q.A. expects the evacuation and bagging rate for the proposed wheat handling facilities on the multi-purpose bearth to be over 10,000 tons per day.

On Semi-bulk cargoes, such as rice, fertilizers and cement, the berth throughput at Karachi is only about 2500 tons per berth per day but this figure could be doubled with further mechanization (conveyor-belts, mechanical bagging, etc.) and the yearly berth-throughput at 75% occupancy would increase from 0.7 to 1.4 million ton per year.

P.Q.A. calculates with a berth-throughput for the loading of rice of 1.1 million tons per year, which figure would increase over the years with improved handling gear and methods.

In our calculations we have conservatively based on an average yearly berth-throughput of bulk and semi-bulk cargoes of 0.850 million tons in 1980, gradually increasing to 1.250 million tons in the year 2005.

For general cargo in conventional stow, carried in liner vessels the berth throughput should be 0.250 to 0.300 million tons per year. In fact the actual figure in Karachi in the 1966-1972 period was 0.290 million tons per berth per year (10-4 tons per gang per hour) but in the 1972-1978 period this was halved to 0.145 million tons (5.2 tons per gang per hour).

This is less than half of what should be expected from a two-shift system on conventional basis where the production should be 12, 5 to 15 tons per gang per hour or 1000 tons per day. This gives 275,000 tons per berth per year at 75% occupancy. In a palletized system production would be twice as high.

In our calculation we have based, again very conservative, on an average yearly berth-throughput for conventional general cargo of 170,000 tons in 1980, increasing gradually to 250,000 tons by the year 2005.

For general cargo in containers we have assumed a production of 50,000 t.e.u.(twenty foot equivalent units) per container gantry crane per year.

on that basis the yearly throughput per berth will be 0.500 million tons with one container gantry crane or 1.0. million tons with 2 cranes. We have calculated with an average yearly berth throughput of 0.750 million tons. A similar throughput can be expected from ro-ro cargoes. Berth throughput without shore-based gantry cranes will be considerably less (about 1/3 of the above mentioned figures).

Total dry-cargo throughput of Karachi Port has not changed much during past 12 years.

The average was 5-4 million tons per year, of which 3.0 million tons(semi-) bulk cargoes and 2.4 million tons general cargoes.

The year 1978/79 showed a sudden considerable increase in the import of wheat, fertilizers and cement. The handling of this additional 2.5 million tons semi-bulk cargoes put a heavy strain on the port and inland transport facilities.

The main issue was the quick clearance of these cargoes from the port to inland destinations and a National Logistics Cell was established to improve berth-throughput and to organize and coordinate the land transport.

Table 1 on page 6 gives the actual cargo throughput of Karachi Port during the period 1966-78 and estimates for the year 1978/79 and 1979/80.

3. CARGO PROJECTIONS, BERTH REQUIREMENTS
AND BERTH AVAILABILITY 1980 - 2020.

3.1. As discussed about (under 2.1 and 2.2) the capacity of the specialized facilities for the handling of liquid bulk cargo (in Karachi) and bulk cargoes for the steelmill (in Port Qasim) are adequate for a long time to come and are left out of further consideration in this paper, which will concentrate on (semi-) bulk and general cargoes.

3.2. TABLE - 2

NUMBER OF MULTI-PURPOSE DRY-CARGO
BERTH AVAILABLE IN PAKISTAN

<u>Year</u>	<u>Karachi</u>	<u>Port Qasim</u>	<u>Total</u>
1968/69	18	-	18
1978/79	24	-	24
1979/80	28	-	28
1980/81	28	4	32
1982/83	28	7	35

The total length of the Karachi berths is 4500 m. (average 160 m per berth) and of the Port Qasim berths 1400 m (average 200 m. per berth).

As (semi-) bulk cargoes will in future be handled in Port Qasim, most of the 28 dry-cargo berths in Karachi will be available for general cargo.

In recent years the 2.2 - 2.5 million ton of general cargo was handled on 14-18 of K.P.T.'s berths.

The future number of berths required for general cargo will be about the same, as the increase in quantity of cargo will be compensated by the improved productivity per berth, mainly on account of the shift from conventional cargo to containerised cargo which trebles the berth-throughput.

In the near future most of the containers will be carried on liner vessels in a combined operation with conventional general cargo.

For instance the new liner vessels of P.N.S.C. will have a capacity to carry upto 390 containers. These containers will be discharged at the container berth on the day of arrival, then the vessel will shift to a general cargo berth for the discharge and loading of conventional cargo and on the day of sailing the vessel will again shift to the container berth to "top of" with export containers.

It is therefore necessary that container-berths with gantry cranes are provided in Karachi, for the handling of these multi-purpose vessels, by conversion of one or more of the general cargo berths.

In the more distant future, for the handling of larger vessels in a full-container-system, it might be necessary to develop a Special Container facility alongside deep-water.

P.Q.A. claims that this facility should be developed in Port Qasim where there is deeper water, greater berth space, large storage areas within one mile of the berths and good road and a rail access available.

3.4. TABLE 3 on page 10 gives a projection of the cargo throughput, berth requirements and berth availability in Pakistan for the 1980-2020 period, based on presently available and under-construction berths in Karachi and Port Qasim.

The yearly berth throughput figures have been based on very conservative productivity estimates and a berth occupancy of 75%.

Since independence the average growth rate of Pakistan's maritime cargo-volume has been 3.8%.

In Table 3 the average growth rate for the future has been taken at 3.5% per year and the shift from conventional to containerised transport at 2% per year.

On that basis Pakistan has sufficient berth space for the requirements of the next 40 years.

It is of course possible that the average growthrate will be higher or lower and the projections will require constant monitoring and year by year adjustments.

It is however clear that even if the average growthrate would be twice as high, there will be no need for any additional berthspace during the present century, with the possible exception of a deep-water container berth in the last decade.

In the event of a spectacular increase in the movement of a (semi-) bulk cargo a fully mechanised handling system could be introduced for that commodity which would at least double the berth-throughput.

4. PORT DEVELOPMENT:

4. 1. In future, rather than on the number of berths, the emphasis will be more on the quality of the berths availability of suitable handling equipment and utilisation of modern operation techniques.

The lay-out of the berths will have to be adapted to suit modern cargo handling methods, with relatively less covered shed-space and more clear, well surfaced, open space.

Part of the activities presently taking place within the port area will be shifted to inland freight terminals or places of origin and destination of cargo.

P.Q.A. agrees with the above but fears that because of lack of specialised transport, the shifting of the activities away from the port area is likely to take a long time. However, they are of the opinion that availability of large storage areas immediately adjacent to the berths at Port Qasim will remove a major part of this need to transfer the activities to inland areas.

4. 2. General cargo in conventional stow will in future mainly be palletized (on stevedoring pallets if not on shippers pallets), pre-slung, or otherwise unitized.

The trailer-towing system will be gradually replaced by fork-truck operations which, apart from speeding up the handling, will also give a better utilisation of the available shedspace.

Port Qasim intends to use, instead of the minitrailer system, large 20 ton trailers for the movement of cargo from the ship's side to the outside storage area or transit shed. There the cargo will be sorted, palletized and further handled by fork-trucks.

4. 3. The increasing number of containers will be handled on berths equipped with container - gantry cranes and equipment for second - handling (transtainers, etc.). Shed space will in future not be required for these cargoes in the port area and, with a gradual move towards door-to-door transport, the stuffing, stripping, repairs, cleaning and storage of containers will be shifted to inland areas.

The same applies to roll-on/roll- of cargoes.

What is required in the port area for these cargoes is well surfaced open space for temporary transit storage only.

4. 4. Handling of semi-bulk cargoes will in future be further mechanised through the use of conveyor-belts and palletisation.

For the bulk cargoes, if the quantities in which the different commodities move are large enough, the capital investment of full mechanisation and handling through silos would be justified as the throughput per berth would increase considerably and freight rates would reduce in view of faster despatch of the ships.

4.5. For the handling of conventional general cargo the allocation of fixed berths to the shipping lines would greatly improve the control and efficiency of operations.

This is especially vital to P.N.S.C., which, at its homeport Karachi has sufficient trade to permanently utilise a group of 5 or more berths. Full control of handling operations on fixed berths at the homeport is essential for an economic liner operation.

Independent stevedoring companies could combine the joint cargo handling requirements of several smaller port users, to obtain the advantages of operations of fixed berths.

The berths could be leased on a long term basis from the port authorities.

Port Qasim intends to lease berths for about five years in groups of two to private cargo handling companies.

As none of the liner companies will, in the near future, have sufficient throughput to fully utilise a container berth it is suggested that this berth is operated as a common user berth by the port authority.

5. PAKISTAN PORT AUTHORITY:

5.1. Upto 1980 Karachi, as the only seaport of the region, has to handle all maritime imports and exports of Pakistan and Afghanistan.

In 1980 Port Qasim will come into operation to handle all future steelmill cargoes and most of the (semi-) bulk cargoes. Karachi will continue to handle the oil cargoes and general cargoes.

Coordination between the two ports could considerably cut overheads by avoiding duplication of service. This is agreed by all parties but there is a difference of opinion about the degree to cooperation.

PNSC favours a situation where both ports work independently in competition with each other while the Ministry of Communications should play the role of coordinator only when such a necessity arises.

The past experience of PNSE in its homeport no doubt influences the preference for a situation whereby two adjacent ports are competing for the trade.

This might give short-term advantages to the shipowners but in the long run the duplication of services and resulting over-investments will have to be paid for and will increase the costs.

P.P.A

← COORDINATION →

P.O.A.

K.P.T.

daily operations
P O R T C A S I M

daily operations
K A R A C H I P O R T

Planning, finance, port tariffs.

Industrial relations, administration,
welfare, medical facilities, training.

Local transport of labour and goods.

Warehouses, inland storage, C.F.S.'s.

Purchase of equipment, spares and material.
Construction, maintenance and repair of
infrastructure, equipment, floating craft.

Fire Fighting

Security

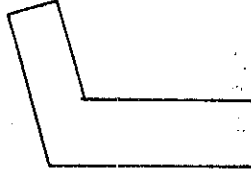
dredging

Floating craft

tugboats

Pilotage

radio communications, navigational aids



GENERAL
CARGO

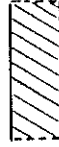
+

L I Q U I D
B U L K



(SEMI-) BULK
CARGOES

+



STEE LM I L L
B U L K



The port authorities, although in favour of coordination, do not wish to loose too much of their autonomy in the process.

The Ministry of Communications has proposed the establishment of a Port Council to act as a coordinating machanism while the operation of KPT and PQA are kept separate.

The National Transport Research Centre, has proposed that the best solution, from a national point of view, would be the establishment of a Pakistan Port Authority which would be concerned with the coordination of activities and formulation of policy decisions, whilst KPT and PQA would continue as organizations for the daily operations of the two ports.

A diagram of this proposed coordination is given on page 15.

5.2. Coordination between the two ports is proposed in the following sectors:

* Long term planning to arrive at rational division of the workload and coordinated development of facilities at the most suitable location.

The Ministry of communications prefers to limit this to projects involving more than Rs. 3 crores. P.Q.A. agrees to cargo allocations between the ports as far as long-term planning is concerned but prefers to be free to compete for cargoes at any given time.

- * Joint Financing spreads the burden of debt servicing and facilitates the obtaining of loans, as a joint approach increases the credibility of the projects.
- * A related Port tariff structure to avoid un-economical competition and to protect the port users.
- * Industrial relations, administration, welfare, medical facilities and training of port labour for the two ports on a uniform and joint basis.

P.Q.A. comments that if Port Qasim organizes and manages berth operations in a completely different manner from Karachi Port, using different methods, different shift systems and different gang practices, then the labour policies can not be uniform. However, labour practices and operation methods for the same kind of work on multi purpose berths can not remain basically different in adjoining ports.

Different labour policies would invite conflict situations which will be detrimental to industrial peace.

It is strongly recommended that advice should be sought from an organization like I.L.O. which has considerable experience in this matter.

* Pooling of resources or joint ventures for local transport of labour and goods, inland storage and freight terminals, if these services are operated under the control of the port authorities.

* Standardization and central purchase of equipment, spares and materials, Joint facilities for the maintenance, overhaul and repair of infrastructure, equipment and floating craft (with separate local facilities for on-the-spot routine maintenance):

Standardization on a two-port basis gives additional advantages economics of scale.

In negotiations with outside contractors a coordinated approach of the two ports will strengthen their bargaining position.

* Pooling of firefighting equipment, security, dredging Floating craft and tugboats.

P.Q.A. considers that as the ports are 30 miles apart it will not be possible, apart from the pooling of dredging, to combine these activities.

It is agreed that basic facilities and equipment should be available on the spot in each port, but some of the sea-going tugboats and other craft could be used in either port according to the workload at any given time. Also specialised fire-fighting equipment, centrally located, could reach and assist either port within half an hour.

* Combined pilot-service(station, pilot boats), radio-communications and control of navigational aids of the two adjacent ports would give a considerable saving in cost and improve the service.

5.3. The organization form for the desired coordination between the two ports, in a national port authority or council, and the composition of its members will have to be studied further and will mainly depend on the degree of autonomy which will be left to KPT and PQA.

Apart from the Government KPT and PQA also the PNSC and the other port-users should be represented in the new coordinating body.