

Bangladesh Logistics and Trade Facilitation

Bangladesh's export trade has grown rapidly over the last decade, but it is facing increasing competition from East Asia not only for the North American market but also for the European market. While Bangladesh has demonstrated an ability to produce to the standards required by these markets, it is now faced with the challenge of delivering its exports to meet continuously decreasing order cycles. For this purpose the speed and reliability of the supply chains must be improved for both the supply of inputs to production (inbound) and the shipment of products worldwide (outbound). This chapter examines both the logistics for Bangladesh's principal exports and the quality of logistics services in order to identify initiatives that need to be undertaken to improve competitiveness.

Logistics Requirements of Major Exporters

Ready Made Garments

The manufacture of Ready Made Garments is Bangladesh's largest export industry and the most demanding in terms of fast, low-cost, and reliable logistics. The industry is subdivided by production technology between woven goods and knitwear. For woven goods, manufacture is largely CMT and therefore uses imported fabrics and accessories.¹ Some manufacturers have the capacity to dye and process fabric but there is limited local capacity for weaving and the output is produced primarily for domestic consumption. The knitwear industry is more integrated. Many of the companies that manufactures garments also do the spinning, dyeing, and knitting of the fabric. The principal import is raw cotton or synthetic fiber. Most of the accessories are locally produced.

The order cycle time for woven garments is longer because of the time required to import fabric and accessories. Most production is made against orders from buyers who specify the type, pattern and color of the fabric. Therefore, opportunities for reducing the order time by maintaining an inventory of finished fabric and accessories are limited. The only fabric that can be kept in inventory is gray cloth of standard specification. This can be dyed locally to produce relatively simple patterns. For knitwear, the local spinning mills produce yarn on a continuous basis and sell to the local knitting mills, that produce fabric for local manufacturers. The spinning mills maintain up to several months of raw cotton inventories so that the spinning mills can operate continuously. They also maintain from a few weeks to 1 month inventory of spun yarn for sale to the knitting mills so that they can respond quickly to changes in demand from garment manufacturers.

Imported fabrics and accessories are shipped CIF. Shipment times depend on whether the suppliers have the goods in inventory, in production or whether they must be scheduled for production. The time for ocean shipments is predictable since the mainline vessels operate to a fixed schedule. There is frequent feeder service with transit times of five days and unloading times of 2-3 days. The maximum time to clear temporary imports is two days and the time for transport in bond is less than one day unless the manufacturer chooses to use the rail service. The only uncertainty is how fast the container is made available once it has been offloaded in the port of Chittagong, but this rarely exceeds 2-3 days.

Garments are shipped directly to the buyers generally on FOB terms. Manufacturers hold only enough inventory to consolidate a shipment. The time for shipment from the factory to the buyer's warehouse depends on three sequential movements:

¹. Cutting, Making, Trimming. This normally assumes that the buyer supplies the fabric and accessories, but many of the manufacturers purchase these inputs based on the technical specifications provided by the importer.

- a domestic land movement from the factory to the port, either directly as loose cargo in a truck or as a multimodal movement of loose cargo in a truck and a container on rail,
- an ocean movement on a feeder vessel up to Singapore or Colombo and then on a mainline vessel to the destination port, and
- a foreign land movement from the port of destination to the buyer's warehouse.

The domestic movement is arranged by the manufacturer or his forwarder, whereas the ocean and foreign movements are usually arranged by the foreign buyer acting through his forwarder. For the domestic movement, the goods are loaded into a marine container at the port, off-dock container yard near the port, or Dhaka Rail Inland Container Depot (ICD) in Kamalapur. The latter involves a multimodal movement that is more expensive and has a longer door-to-door transit time, but provide the advantage of stuffing the container at the factory or ICD rather than in the port and the additional protection of shipping the goods in the container all the way from Dhaka.

The shipment time from the port to the buyer's warehouse is more difficult to predict. Although the transit time to the port is usually only one day, the time in port varies from one to four days. Feeder vessels do not, in general, operate fixed day-of-the-week schedules but there are frequent sailings. The transit time, including time to unload, is 6-7 days. The mainline vessels operate to a fixed, day-of-the-week schedule. Since most buyers designate these vessels, the date of arrival is known. The larger buyers select vessels based on worldwide agreements rather than minimum shipping time. Smaller buyers must balance transit time and freight rate in making this decision. The transit time from the destination port to the buyer's warehouse is also well known.

The major source of uncertainty is the time the goods spent at the transshipment port between the arrival of the feeder vessel and the departure of the mainline vessel. It is not possible to synchronize feeder vessel movements with the scheduled movements of mainline vessel. In order to ensure meeting a specific sailing, the container must remain in the transshipment port for several days. The timing and cost for the complete order cycle is shown in Figure 1 and Table 1, respectively.

Table 1: Performance Statistics for Petrapole/Benapole

Activity	Without delay	Actual average	Coefficient of Variation
Load at Kolkata	2.5	6.6	2.48
Transport to Petrapole	2.4	5.6	.28
Time at Petrapole	21.3	99.4	.25
Time Waiting at Benapole	N/A	N/A	N/A
Unload at Benapole	1.8	10.8	1.32
Return to Petrapole	1.6	6.3	.41

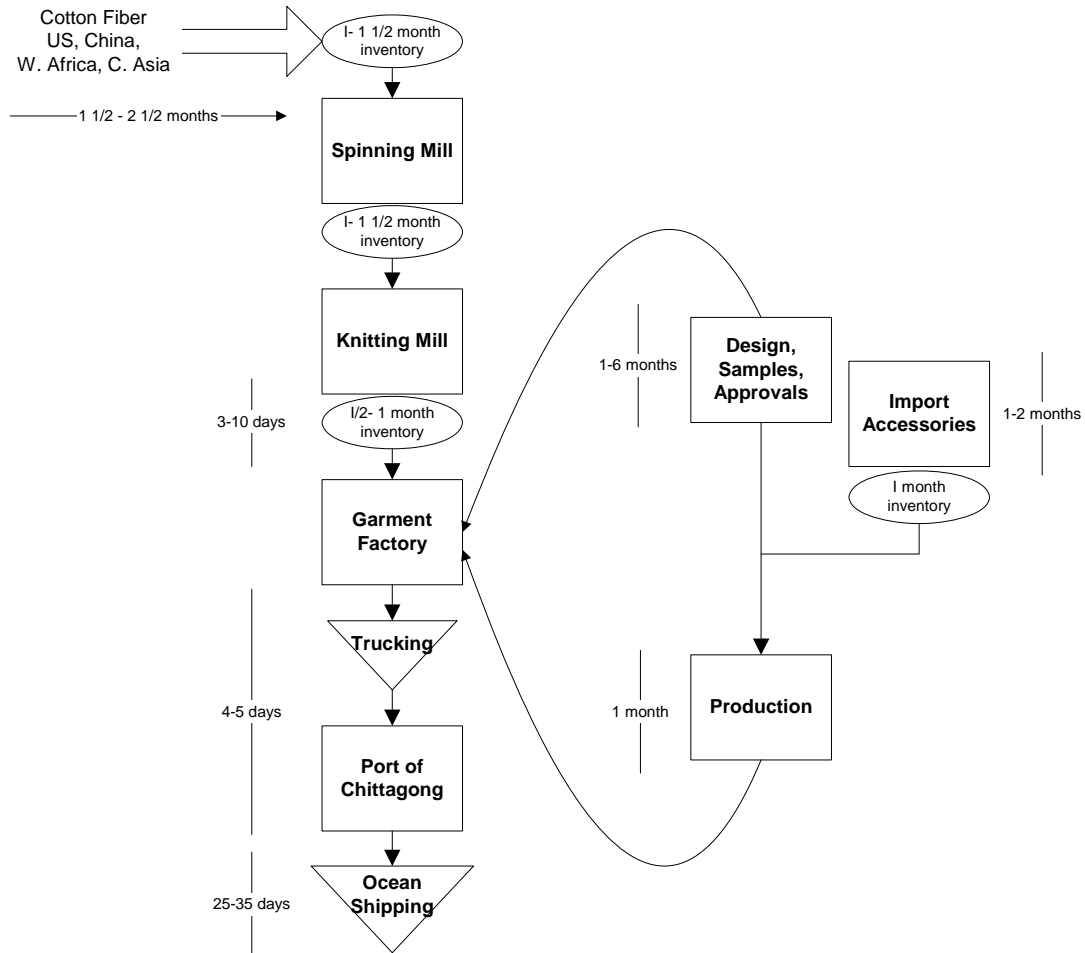
Source: Das and Pohit, NCAER

This order cycle is comparable to that reported in Laos where yarn and fabric must be imported from Thailand. Although the distance for the inbound logistics is shorter, the order times are similar. Production time is also comparable. Exports are transported from the factory in containers to the Thai ports and loaded on the ship is 3-5 days. The transit time to Singapore for transshipment is only 2 days and since the feeders operate to a day-of-the-week schedule, the time in Singapore is only a few days. The result is a savings in the outbound supply chain of 1 week to ten days and a slightly lower freight rate. Thailand garment producers have an even shorter order cycle since it produces its own fabric, 2-4 weeks less than Bangladesh, but this is offset by much higher labor costs. Vietnam has a slightly shorter order cycle even though it imports most of its yarn and fabric from China and transships via Singapore or Hong Kong. The order times from China are shorter and the shipping time from the factory to the US West Coast is only about 23 days, and only a few days more to the US East Coast. This resulting savings in order cycle time is 3-4 weeks for woven goods and 1-2 weeks for knitwear. For China, the

availability of domestic textiles and the location of manufacturing facilities near to the port offer an additional two weeks reduction in order cycle time relative to Vietnam.

Over 90% of garment exports are shipped by sea, but a substantial and increasing share are shipped by

Figure 1: Inbound and Outbound Supply Chains for Ready Made Knitwear



airfreight. Relatively few of these air shipments are done at the request of the buyer. Rather, a manufacturer, who is late in delivering the garments to the port, chooses airfreight rather than miss an agreed delivery date. Since door-to-door costs with airfreight are about 5 times greater than those with ocean freight, the impact on profitability is considerable. This problem is further exacerbated during the peak season when there is insufficient airfreight capacity and air freighters must be chartered in to meet demand.

The competitive challenges facing Bangladesh's garment industry over the next five years remain price, quality, standards of manufacturing and order cycle time. The industry has been successful in addressing the first three and can continue doing so assuming political stability and improving labor relations. The last challenge, to order cycle times, is more problematic. For knitwear, the order cycle time of 2½-3 months, assuming relatively little upfront design, is comparable to China and Vietnam for shipments to Europe and only slight greater for shipments to the US West Coast. However, for woven goods, the additional month required to import fabric places Bangladesh at a competitive disadvantage relative to China and its longer outbound supply chain gives it a slight disadvantage relative to Vietnam.

If Bangladesh is to continue producing large amounts of low-value woven garments, it will have to significantly improve the performance of its inbound and outbound supply chains. If the knitwear industry is to continue its rapid growth, it will have to improve its outbound supply chain from factory to buyer's warehouse. The alternative is for both industries is to focus on niche markets where order cycles are not as critical, but so far there has been no interest in doing this.

The difficulty with improving these supply chains is that the garment industry has limited control over logistics services and no control over the associated infrastructure. Much of this improvement will require action by government. Although there has been substantial successful in streamlining customs and improving trade finance, further improvements are required. The government also needs to address the delays incurred as a result of poor transport infrastructure and inefficiency due to public management of commercial transport services, most notably the Port of Chittagong and the Bangladesh Railways.

Leather and Tableware

Other export industries have similar problems with the efficiency of their inbound and outbound supply chains but have less demanding logistics requirements. Leather and leather products are similar to garments except that most of the leather is produced locally while the accessories are imported. Bangladesh has been able to export blue and crust leather but has had difficulty in exporting shoes and handbags. Its traditional finished goods export business was to produce small orders, but this has ceased and currently only one factory is able to operate as a contract producer providing large volumes of lower value products for a European manufacturer. The logistics for leather products are less demanding than for garments because the styles change slowly and the buyer is able to hold some stock

The logistics for tableware and other ceramic exports are even less demanding. The inputs, including clay and chemicals, are imported, but are generic inputs and the manufacturers can maintain several months inventory in order to ensure continuous firing in their kilns. The foreign buyers are generally willing to hold inventory since designs change relatively slowly and most sales are filled from warehouse inventory rather than from retailer's shelves. Nevertheless, as the big box retailers such as IKEA enter the market, order cycles will decrease and product inventories will be reduced.

Fresh Vegetables

The other major exports, vegetables and shrimp have elaborate logistics because the products are perishables and production involves small-scale rural producers. Only one company, BRAC, (Bangladesh Rural Advancement Committee) is responsible for most of the fresh vegetable exports. It purchases the vegetables directly from contract farmers to whom it supplies seeds and other agricultural inputs to ensure the quality of the product. BRAC operates two small processing facilities near the farms to select, grade test and package the vegetables. The vegetables are trucked from these facilities direct to the airport or, in some cases, to its larger processing facility in Tongi where additional tests are conducted as required by the EU. BRAC provides its own refrigerated trucks and cool storage. Export shipments vary in size from one to ten tons.

The major products include French beans, bitter root, long beans, chilis and some traditional vegetables. These are sold to wholesalers and buyers for supermarkets in Europe, the Middle East and, to lesser extent, Southeast Asia. The total amount shipped in 2003 was about 800 tons of vegetables and 1000 tons of potato. This trade is small but has been growing rapidly. The retail outlets for these products has been changing for stores selling primarily to South Asians to large grocery stores with the result that delivery times and quality standards have become more important but order sizes have also increased. Most of the growth has been achieved through networking with buyers as well as displays at vegetable trade fairs in Singapore, Dubai, California and Netherlands.

BRAC exports against year-round contracts that include standing orders for certain types and amounts of vegetables. These are shipped by air on a daily or weekly basis. In order to be competitive in the Middle East, BRAC uses Biman Airlines, which offers a concessionary rate of only \$0.70 per kg., but has insufficient capacity to meet the demand in the Middle East. For shipments to Europe, BRAC uses other commercial carriers and pays rates of about \$1.3 per kg.. since Biman does not offer a concessionary rate Because the maximum permissible shipping time for leafy vegetables, which make up a majority of the exports, is 10-12 days, the markets that can be served by ocean freight are limited. It is possible that the excess demand in the Middle East could be met through shipment in ocean containers, at much lower delivered price, but this would require careful planning and transshipment through Colombo. It would also require proper packing and mixing of fresh vegetables in containers. Potatoes are shipped via ocean freight to Singapore and Malaysia. They could also be shipped to Europe but there is no demand for imported potatoes.

Because fresh vegetables cannot be shipped by sea to Europe and because the high cost for airfreight reduces profitability, BRAC is now considering producing frozen vegetables for the European markets. This would increase the value per kilogram thereby offsetting the high costs for airfreight. More importantly, it would allow for shipment in refrigerated marine containers, which would resolve the problem of insufficient airfreight capacity and increase the profitability of this export. Since, the logistics are already available, it only remains to be seen if efficient production facilities can be established and if the market for frozen vegetables is as strong as that for fresh vegetables

Shrimps and Prawns

The other perishable export is Tiger Prawns (*Penaeus monodon*) exported to the United States and freshwater prawns (*macrobrachium*) shipped to North Europe. The existing production arrangements involve a complex supply chain. Traditional shrimp farming relied on collection of fry from the mangrove swamps and inland waterways, but since 1997 there has been a dramatic growth in production of fry from shrimp hatcheries. Most of the hatcheries (43 out of 48 in 2000) are located in Cox's Bazaar and Teknaf in southeastern Bangladesh where there is the right combination of fresh and salt water and a natural supply of shrimp fry to replenish the brood stock. Almost all shrimp are grown in farms located in the rural areas around Khulna in western Bangladesh. This is the center to the traditional shrimp farming industry since there are appropriate environmental conditions including an adequate supply of both fresh and salt water.

The shrimp fry are fed with imported feed, artemia, shipped in containers from the United States through Chittagong and trucked down to Cox's Bazaar. The fry are transported from Cox's Bazaar to the farms around Kuhlana in polyurethane bags containing a saline mix. This involves a movement by truck to the airport in Cox's Bazaar, then by small plane to Jessore and finally by truck to the farms around Khulna. The yield from the fry has been relatively low with mortality rates of 60%- to 0%. The high level of mortality is attributed to problems with the quality of the broodstock, the farming techniques and the stress associated with multimodal transport. Recent efforts to test the fry prior to shipment and more careful planning of the shipment have reduced mortality to about 30%.

The growing season for shrimp is 120 days and there are two seasons per year, after which the monsoon rains are used to clean the ponds. Once the shrimp reach maturity, they are packed in barrels with ice and transported by truck to the processing plants around Khulna for grading, testing cleaning, removing heads, freezing and packaging. Because of past problems with quality, the major factories now conform to HACCP requirements.² The processed shrimp are loaded into refrigerated containers and shipped by

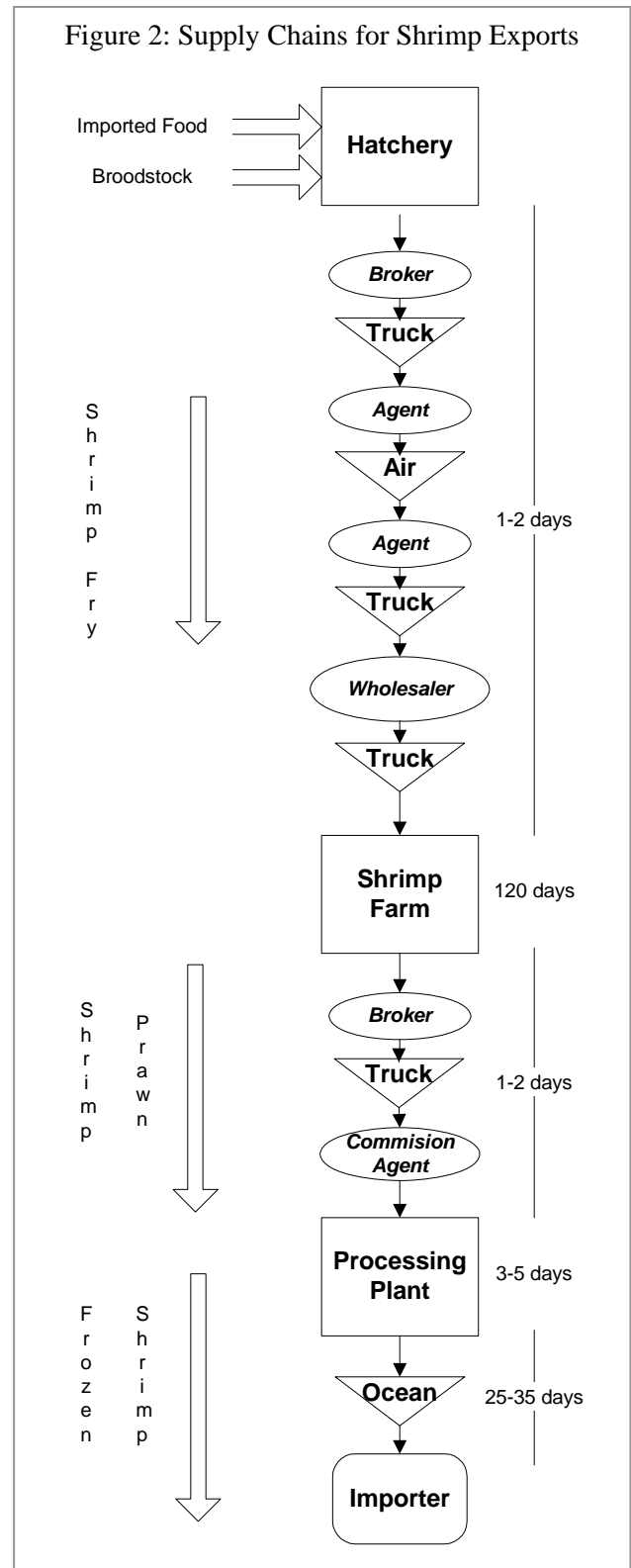
² The physical, chemical and biological tests done by exporters as per HAACAP include tests for salmonella, vibrio cholera, E coli, antibiotics, standard plate count, and others including heavy metal as per buyers requirements.

barge to the Port of Mongla for loading onto feeder vessels. Recently some processing plants have now been established in Chittagong to take advantage of the better shipping services at Chittagong port. From these ports, the shrimp are shipped via Singapore to Northern Europe and East Coast of the United States. Typical shipping times are 30 days to Europe and 40 days to the East Coast of the US. Exports of frozen shrimp have problems with reliability of shipment times, similar to that for garments, but the buyers are able to maintain sufficient inventory in cold storage to offset any delays.

Because of the fragmented supply chain for both Tiger prawn and fresh water prawn, middlemen participate at both the origin and destination of each internal move. As a result, the farmers lack direct contract with either the source of fry or the markets in which the shrimp are sold. The principal challenges for the shrimp export industry are to improve the quality of fry, the efficiency of the shrimp farms and quality control of the exports. The former requires better logistics including careful control of the temperature in which the shrimp are transported and the handling when transferring between modes to reduce the mortality caused by stress during transport from the hatcheries to the farms. Efficiency in farming can be improved by simplifying the supply chains so that there is more direct interaction between the shrimp farmers and both the hatcheries and the processing plants. Improvements in logistics would also reduce the number of intermediate transactions and middlemen associated with the transfer from one activity to another.

Because frozen shrimp are high value cargo with relatively long shelf life, the growth in demand has not placed competitive pressure on the cost and time for shipment. The handling of refrigerated containers has been relatively robust and the shipping lines have been able to adjust their schedules to meet the needs for shipping during peak season. This will change as Bangladesh's costs of production increase and competition from other sources grows.

Vietnam, which is one of the largest exporters of farmed shrimp, has simpler supply chains. It has had similar problems with its outbound logistics because of the location of the farms away from the major ports. However, it is in the process of improving its cold chain to include movements of reefer containers on barges direct to the vessels for loading in Saigon Port. A similar process could be introduced in Bangladesh to move the reefer containers from the factory to the container vessels calling at Chittagong. The anticipated improvements in Chittagong port will reduce turnaround time and create new



opportunities for feeder vessels to make a second calling at Mongla, but the potential for barging refrigerated containers from Khulna to Chittagong should offer a more reliable and less costly shipping service.

Transport Corridors

The two major transport corridors that serve Bangladesh's international trade are those that connect Dhaka with the West Bengal and with the Port of Chittagong. Other transport corridors that serve international trade but handle much smaller volumes include the connections to Assam, Meghalaya, Tripura, Bhutan and Nepal.

West Bengal-Dhaka Corridor

The West Bengal corridor includes the road route via Petrapole/Benapole and the rail routes via Darsana, Rohanpur, Benapole, and, to a lesser extent, Biral. The former is the major route for manufactured goods imported from India and a much small amount exported from Bangladesh. It had been a major source of Indian fabric and yarn for the Bangladesh garment industry, but the Bangladesh government now prohibits these imports from using the land route.³ The rail routes are used primarily for bulk shipments of grain, stone and other low value commodities. Both the road and rail routes require an interchange at the border. For road transport, the cargo must be transshipped between the Indian and Bangladeshi trucks. For rail transport, the gauge is the same so the Indian wagons can move across the border but the trains must be reconfigured since the rakes in Bangladesh are shorter.⁴ Also the locomotives must be switched.

Indian wagons are not allowed to cross the Jamuna Bridge because of a weight restriction. Also there is little incentive since the broad gauge line does not yet extend to Dhaka. As a result about half the wagons go to Noapara where they are offloaded on to barges for shipment to eastern Bangladesh. The other half follow a circuitous routes that leads to a terminal just west of the Jamuna Bridge. The potential for growth in rail traffic, both bulk and container, is considerable but requires a lifting of the restrictions on the use of the bridge.⁵ Further improvements will be realized once the bridge across the Padma River is constructed offering a faster land route from Khulna to Dhaka than via the Jamuna.

The road crossing at Petrapole/Benapole is a major source of delay for goods moving by truck between West Bengal and Bangladesh. On the Indian side, there has been little development of infrastructure resulting in long queues for crossing the border. This has been partially offset by the attempt to simplify customs procedures for exports, which represent a majority of the traffic. However, the idle time spent at Petropole is much greater than the time in transit from Kolkata as shown in Table 2.

On the Bangladesh side, there has been extensive development of the land port infrastructure, but the procedures for clearing Indian cargo have become more time consuming. Indian trucks must transship their cargo at the land port in Benapole. This requires considerably more time than the transit time to Dhaka as it involves offloading the cargo, temporary storage, and reloading to a Bangladeshi truck. The transfer is done under the supervision of the customs. Recent improvements in the land port operations have reduced the turnaround time for Indian trucks to 3-4 days, most of which is spent waiting for customs officials. The time that cargo remains in the land port depends on the importer and type of cargo, but is not be less than 4 days with the exception of perishables the period.

³ This was introduced as a Non-tariff barrier to trade at the urging of the domestic textile producers. The water route from the mills in Kolkata to the garment factories located near Dhaka takes to much time and involves more handlings of the cargo.

⁴ Bangladesh Railways wagons cannot operate in India because they cannot travel at the speed of Indian trains

⁵ A High Point Rental Report recently confirmed that the bridge can support wagons carrying loaded containers.

Table 2: Performance Statistics for Petrapole/Benapole

Activity	If no delays	Actual average	Coefficient of Variation
Load at Kolkata	2.5	6.6	2.48
Transport to Petrapole	2.4	5.6	.28
Time at Petrapole	21.3	99.4	.25
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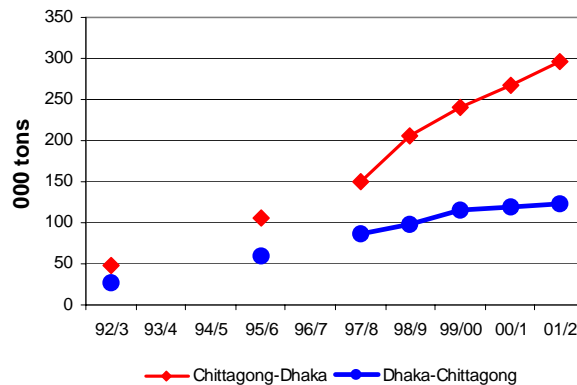
While the land port solved the problem of lack of infrastructure, it created a problem in terms of trade facilitation. Rather than encouraging the movement of cargoes under seal to a location closer to their final destination where the customs formalities can be completed, Customs are introducing delays at the border while the operators of the land port are making money selling the storage space for cargo waiting to be loaded on to Bangladeshi trucks.⁶ The land port has institutionalized border delays by making them profitable.

Chittagong-Dhaka Corridor

The rail line between Dhaka and Chittagong is primarily single, meter gauge track, although the segment between Dhaka and Tongi is dual gauge. The container traffic on this route has grown substantially over the last decade (Figure 3). However, it is has leveled off because the number of unit trains operated on this route is not increasing. There are three sections along the route that act as choke points with capacity utilization of over 80%. The most congested is between Tongi and Pubail where about 50 train moves are scheduled each day including eight freight trains.

Figure 3

Container Traffic Chittagong-Dhaka Corridor



The road connecting Dhaka and Chittagong is a combination of two lane and divided four-lane sections but it is being gradually upgraded to 4 lane throughout. The road can accommodate tractor-trailers with fully-loaded 40' containers but most of the freight traffic is carried in 4 and 6 wheel fixed-axle trucks. Congestion is growing especially around Narayanganj and Dhaka with current transit times of 6-7 hours implying an average travel speed of only 35-40 kph. Despite the congestion, and because the railroad is capacity limited, the road handles about 83% of the container cargo moving between Dhaka and Chittagong, much of which is moved as loose cargo.

⁶ The operators also make money from the Indian and Bangladesh trucks waiting to transship, however, the Bangladeshi truckers have refused to use the paid parking area and instead part their trucks along the side of the road. On the Petrapole side of the border there has been no development of warehousing because of the small volume of imports from Bangladesh, however, a parking area has been constructed allowing the operators to profit from the queue caused by inefficient export clearing procedures.

This corridor also has an air route with frequent daily flights between Dhaka and Chittagong and an inland water route from Naranganj down the Meghna and across the bay to Chittagong but the freight volumes are small.

Transport Modes

Ports and Shipping

Despite difficulties in the various routes connecting the industrial and market area around Dhaka and the Port of Chittagong, the the major bottleneck for Bangladesh’s export logistics is the port of Chittagong. Because of the relatively small volume of cargo handled and the distance between Chittagong and the major shipping routes, Bangladesh imports and exports are transported on feeder vessels. Nevertheless, the volume is sufficient to justify shuttle operations between Chittagong and both Singapore/Tanjung Pelapas and Colombo with several calls per week and strong competition. The rates and times for shipments to Europe and the U.S. East Coast are comparable to those for Kolkata/Haldia, Penang and Vietnam. The comparison of the rates for Chittagong and Haldia in Table 3 show some difference but most of this is attributable to the range of rates offered depending on volumes shipped and the transit times being offered. Transshipment via Colombo offers a competitive advantage for shipments to Europe and US East Coast but but the large buyers of Bangladesh’s exports prefer the shipping lines that call at Singapore since Colombo offers less frequent service.

For shipments to East Asia, and the Pacific Rim, Bangladesh is at a competitive disadvantage relative to China and countries further East. In some cases, it may be at a disadvantage for shipments to the US East Coast because of the all water routes. A comparison of the rates for Bangladesh and the Philippines, which has a similar reliance on feeder services but uses Hong Kong and Kaoshiung for transshipments, indicates an advantage of about \$1000 per FEU to Europe and a disadvantage of about \$1300 per FEU for the US West Coast. This amounts to a difference of less than 2% in door-to-door costs for garments and other mid-value goods.⁷

The feeder vessels calling at Chittagong range in size from 500 to 1000 TEU (twenty-foot equivalent unit). Similar to that for other mid-sized ports in the region There are about two vessel calls per day with a typical vessel transferring 600 containers (875 TEU). The container ships are the more costly self-sustaining vessels because the port lacks Ship-to-Shore Gantry (SSGs) cranes. The on-board container-handling equipment ranges from primitive to reasonably modern depending on the age of the vessel, but overall the average vessel productivity is very low, about 5.6 boxes per vessel hour (Table 4).

Table 3: Shipping rates and times (US\$- Spring 2004)

	Freight Rate		Transit Time (Days)
	TEU	FEU	
	Bangladesh		
North Europe	1000-1500	1400-2400	22-30
East Coast US	2600-3800	3800-5000	27-35
West Coast US	2200-2400	3200-4200	19-28
Singapore	230	460	5-6
	Kolkata/Haldia		
North Europe	800-1300	2100-2400	23-28
East Coast US	2600-3000	4000-4800	30-35
West Coast US	2600-3000	2800-4600	27-30
	Philippines		
North Europe	1400-1500	2800-3000	24-31
East Coast US		3000	25-32
West Coast US	1200-1800	2000-2600	13-18
Singapore	250-550		

Source: Various Shipping Lines

⁷. Typically an FEU will carry \$50-\$75 thousand worth of goods in FOB terms.

The Port of Chittagong is unusual in that it handles about 400 thousand container per year, but it only recently ordered fixed container handling equipment. Under normal circumstances, a container port will acquire a mobile container crane once volumes exceed 25 thousand containers or a Ship-to-Shore gantry crane (SSG) once the volume reaches 50-75 thousand boxes. A second SSG would be acquired before volume reaches 100 thousand containers. CPA is now procuring four SSGs even though the current volume would justify 5-6 such cranes. These cranes will provide a significant increase in berth productivity. Mobile cranes designed for lifting containers normally achieve 18-20 moves per hour while new SSGs will handle 28-35 container moves per hour.

Currently, the average time a vessel spends at berth in Chittagong is 110 hours. Since all of the comparable ports in the region have SSGs, their average times at berth are typically one day or less.⁸ In addition, there are delays waiting for tide and an available berth. Chittagong's berthing delays are reported as being less than one day, but with a berth occupancy at 93% there may be hidden delays as vessels adjust their sailing speed to arrive in time for a free berth. Most of the ports within the region limit berthing delays to 12 hours or less. In the last few years, CPA has significantly reduced vessel turnaround by reducing berthing delays and time at berth, but so have other ports. For example, India has been more successful in reducing turnaround time as shown in Figure 4. This was accomplished through a combination of investment in equipment, increasing private sector participation and allowing interport competition.

Because of the long turnaround times and the uncertainties regarding berth availability, most shipping lines cannot provide a fixed day-of-the-week service in contrast to most other the mid-sized ports including Kolkata/Haldia, Penang and Saigon. Feeder vessels operate on a fixed rotation with sufficient slack in the round trip voyage to overcome delays in Chittagong. A typical voyage includes five days transit time in each direction, one-day turnaround in the transshipment port and five days turnaround time in Chittagong for a total voyage time of 16 days. This may be extended during peak periods to allow for stopping at Mongla for shrimp and other containerized exports.

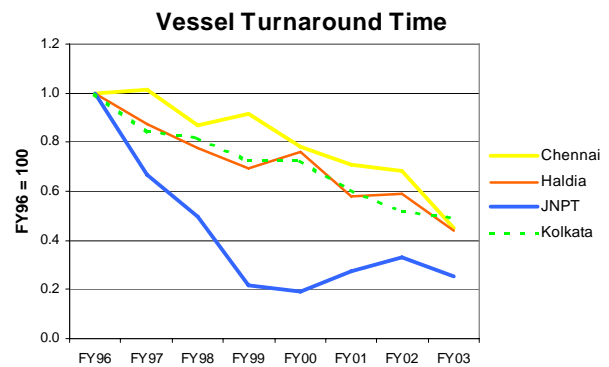
The new SSGs should have a significant impact on vessel turnaround. Assuming two cranes per vessel, the average time at berth could be reduced from 110 hours to 18 hours (including time for berthing, unberthing, removing and replacing the hatches, etc. Allowing for tide, the turnaround time in port would

Table 4: CPA
Container Performance Statistics

Feeder Vessel Calls	~ 700/year
Average Container Moves/Vessel Call	600
Containers/Vessel hour	5.6
20:40 Ratio	55:45
Berth Occupancy	93%
Container Dwell Time	22 Days
LCL Boxes	~ 10% Loaded Boxes
FCL Unstuffed in Port	~ 90%
Stripping Operation	~75% in the yard
Speed Money	50%-100% of formal charges

Source: Tera Intl.

Figure 4



⁸ While this represents a 60% improvement over 1999, it still places Chittagong among the least productive container ports in the world and at the bottom for ports handling similar volumes of container.

average less than 24 hours.⁹ This would save 4 days per voyage and allow for fixed day of the week sailing. This would allow exporters to select a feeder vessel that would arrive at the transshipment port close to the time the designated mother ship arrives thus minimizing the interface time. Overall this would provide an average savings in shipping time of about 6-9 days for outbound cargo and 3-4 days for inbound cargo.

In order to achieve faster ship turnaround, it will also be necessary to eliminate the congestion in the container yard which slows the movement between the vessel and the yard and reduces berth throughput. The congestion appears to have two causes. The first is a long container dwell time that averages about 22 days. Longer dwell times are not uncommon, while more efficient ports limit dwell times to 10 days or less, similar dwell times have been observed in Haldia, San Juan, Douala and Bandar Abbas.¹⁰ However, these other ports have sufficient storage area either on port or in off-dock facilities, This is not the case for Chittagong.

The second cause of congestion is the high proportion of FCLs (Full Container Loads) that are unstuffed in the port. At present about 60% of the inbound boxes have cargo destined for Dhaka. Most are FCLs but most are unstuffed in the port. The four reasons given for not delivering FCLs directly to their destination or a nearby Customs facility, but instead delivering it as loose cargo are:

1. the movement of containers by rail is slow and requires a double handling
2. the rates for road transport of loose cargo are less than for containers.¹¹
3. importers must provide a bank guarantee to remove the container from the port unless shipped to the Dhaka Rail ICD.¹²
4. there are no customs facilities near where most of the production is located for clearing cargo transported by truck.

Airfreight and Airports

The airfreight business in Bangladesh is quite competitive. Pure air freighter services are provided twice weekly by Emirates and weekly by Saudi, Alitalia and Uzbekistan, but most airfreight is carried in the belly of regularly-scheduled passenger flights. Shipments are arranged through air cargo agents rather than airlines but there are a large number of agents providing a competitive service. Biman has the exclusive franchise for cargo handling operations at the airport, but its charges are reasonable even if its equipment is limited.¹³

International airfreight shipments originate primarily in Dhaka although efforts are underway to increase the volume through Chittagong. Since the air freighter services do not go direct to the major export destinations, the cargo must be transshipped. This increases delivery times to North Europe to 2-4 days and to US East Coast to 4-6 days. Passenger services provide more direct connections but space is limited. Because of capacity limitations during peak shipping season, some of the air cargo agents charter air freighters.

⁹ Time at berth includes removing and replacing the hatch covers, waiting for the tide and berthing and unberthing. Turnaround time in port includes the time waiting to berth.

¹⁰ The first two have long dwell times because they offer free storage as an incentive

¹¹ Container haulage is more expensive because of the limited number of tractor trailers and because of the greater likelihood for empty backhaul. Ironically, most of the loose cargo is carried in vans that are fixed axle trucks with a container welded to the chassis.

¹² The larger freight forwarders can make do with a company guarantee.

¹³ Some of the airlines have brought in their own scanners to improve security

Airfreight charges are high compared to ocean freight rates but not significantly higher than for surrounding countries (Table 5). Biman Airlines offers low freight rates relative to its competitors and is able to attract marginal traffic. However, most exporters are willing to pay a premium for the integrated logistics service provided by the larger international carriers. As a result, these airlines have more demand than capacity. This applies even to Thai Airways, which charges a premium for shipments to Europe because it involves backtracking through Bangkok.

As mentioned above, the demand for airfreight does not originate from foreign buyers wanting faster delivery times for their goods but rather from the exporters who have been delayed in shipping their goods. The principal causes for these delays are delays in receiving raw materials and problems with

Table 5: Air Freight Rates (\$/kg)

Destination	Dhaka	Bangkok	Manila
N. Europe	1.35-2.0		1.7-2.0
US East Coast	2.5-3.0	3.0-3.5	2.5-3.0
US West Coast		2.5-3.0	2.0-2.5
Japan, HK	1.5-1.75	1.0-2.0	

Source : Thai Airways International June 2003, various airlines, consultants estimates

scheduling connections at the transshipment port. If these problems were addressed through improvements in customs procedures and port performance, then the problem of insufficient airfreight capacity could be eliminated. As long as Bangladesh exports low value goods with relatively long shelf lives, the buyers are unlikely to require air shipments. Only if there was a dramatic increase in exports of perishables or fashion garments would there be regular shortage in airfreight capacity.

Roads and Trucking

As mentioned above, the majority of general cargo imports and exports are transported between Dhaka and Chittagong as loose cargo. The trucks are mostly vans carrying the equivalent of one TEU (up to 16.5 gross tons assuming a 10 tons axle load). The vehicle fleet is relatively old and mostly two axle trucks. Exporters often use their own trucks to deliver cargo from factories in Dhaka to the rail ICD or from factories in Chittagong to the port. In other situations they use third party providers, who are primarily independent truckers or relatively small trucking companies.

Competition among providers appears to be relatively robust. The rates for the 220 km trip are Tk7000 or about \$0.55 per truck kilometer for a 10-15 ton load. Movements within the Dhaka area, in particular between the factory and the rail ICD, average Tk2500. The higher cost per kilometer reflects the low travel speeds and the large proportion of trip time spent loading and unloading the truck.

The travel time between Dhaka and Chittagong is expected to increase from the current 6-8 hours as congestion in the corridor increases. This congestion is being addressed through donor-funded improvements, but the planning appears to be incremental rather than systematic, addressing deficiencies in certain links without an overall plan for the corridor. Furthermore, there have been no recent traffic counts and information is not available on current levels of congestion on different sections of the route.

Rail and ICDs

Bangladesh Railways (BR) operates a scheduled unit train service twice a day in each direction between the Port of Chittagong and the Dhaka Rail ICD in Kamapur.¹⁴ The transit time for the 298 km trip is about 8 hours. The rakes have a capacity of 76-80 TEU. This service carries about 1/6 of the containers loaded and offloaded in the Port of Chittagong or over ¼ of the container traffic shipped to/from Dhaka. Because of the road congestion in the area surrounding the ICD and its limited space, it has been proposed to establish a new ICD in Tongi, which would be closer to most of the garment factories.

All inbound movements are loaded containers with a published freight rates of TK6000. The actual cost is about Tk7000 allowing for speed money paid to get the box on the train and through the port. The outbound movements are more balanced between loaded and empty. The backhaul rate is only Tk3000 for a loaded TEU and TK1500 for an empty being repositioned.

Because of the high level of demand for inbound movements there is a 3-5 day waiting time for wagon space. Importers appear to be willing to incur this delay even through the cost for a port-to-factory movement by rail and road is higher, about TK 10,000 than for a pure road movement. The advantages of a rail movement appear to be less damage to the cargo by keeping the cargo in the container, better customs service and lower informal charges for unstuffing and clearing containers at the Rail ICD relative to CPA (even though this ICD is also operated by CPA). There is little delay for outbound boxes, the majority of which are empties. The loaded boxes have Priority in loading.

Despite the high level of demand and potential for growth, Bangladesh Railways has not increased the frequency of its profitable unit train operation. The reasons for this include:

- Lack of freight capacity on the route due to government policy that favors passenger services over freight services
- A lack of commercial incentives that allows management to be satisfied with charging a premium (both formal and informal) for this service by rationing capacity.
- Congestion on specific sections that also serve traffic from the northeast, e.g. between Tongi and Bhairab Bazaar and between Laksam and Chakiasma,
- The ICD does not have the capacity to handle three trains a day in each direction.

While there are occasions when three trains are operated in each direction, this only occurs when the delay for containers waiting in the port exceeds acceptable limits as is accomplished by canceling a passenger train movement.

IWT

For decades, inland water transport has been promoted as an alternative mode for transporting containers between Dhaka and Chittagong. Initially this was proposed because of inadequate road infrastructure but more recently it has been suggested as a means to avoid the congestion and delays.¹⁵ A recent proposal for a private service to connect the container facilities in Chittagong with a river terminal in Naranganj is

¹⁴ The Dhaka Inland Container Depot (ICD) was established in 1987 under the joint ownership of the Bangladesh Railway and the Chittagong Port Authority. Container handling operations are under the control of the Chittagong Port Authority. Since August 1991 dedicated container block trains have operated between Dhaka and Chittagong. The Dhaka ICD has a storage capacity for only 1,000 TEU at any one time.

¹⁵ A similar service has been proposed by SSA as a core component of its proposed container terminal operation at Patenga. This concession was cancelled following rather acrimonious political maneuvering by local political interests.

to be initiated with a concession for the terminals at either end.¹⁶ Both the IWT service and the terminal would be privately operated, however, it remains to be seen whether this will attract a significant share of loaded container traffic. The travel time across the bay and up to Naranganj is estimated to be about 16 hours which would make it considerably faster than the current rail service for inbound containers but much slower than road transport especially when the door to door movement is considered. The line haul costs should be lower than for other modes, but have additional costs for loading and unloading the barges and for road transport from the Naranganj jetty to the destination and for clearance of the cargo at Naranganj. Once the service is established, its market share of inbound containers will depend on road transport's level of congestion and BR's pricing policy and delays for the rail transport but is expected to be smaller than for the other modes. It is likely to have a greater share for outbound movement of empties but even for this cargo it would face stiff competition given the low backhaul rates offered by road and rail.

Customs

Bangladesh Customs provides facilities to clear imports and exports at the border crossings, the international ports and airports, the Export Processing Zones in Chittagong and Dhaka and the Dhaka ICD. This procedure requires Clearing Agents (CA), who are licensed individuals. Very few freight forwarders offer cargo clearance services. Instead, importers and exporters select a CA based on demonstrated ability to expedite cargo movements at a reasonable price.

The customs services have undergone significant reforms in recent years. These include:

- Introduction of a Simplified Administrative Document following the UN key layout,
- Expanded use of ASYCUDA++,
- Pre-shipment Inspection for all non-government imports,
- Use of a simplified tariff based on the Harmonized Code (8 digit) and
- Red and yellow (but not green) channels in Chittagong, Dhaka ICD and Benapole.

Also, the procedures for clearing temporary imports of fiber and fabric and exports of fabric and garments were greatly simplified in the period 1999-2002. The number of steps for the former was reduced by $\frac{2}{3}$, while the latter decreased by $\frac{3}{4}$ (Figure 4). Also the number of signatures declined to about 8. The result has been that clearance times have dropped from greater than one week to one day for exports and to 1-2 days imported materials for the production of garments and other exports. Simultaneously, the amount of informal payments for clearing export shipments declined from about TK5000 per shipment to TK1200-1500. Under the current system, the amount of informal payments is negotiated between the shippers and the Customs Agent with both agreeing on the amount per shipment that will be reimbursed without an invoice.

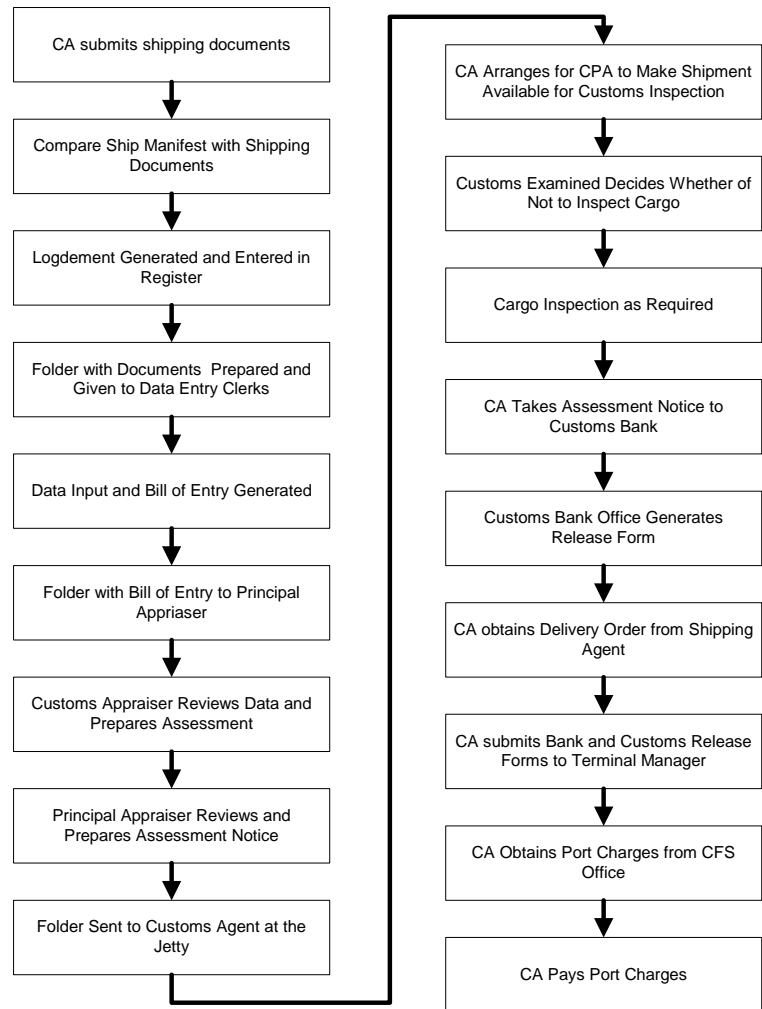
The effectiveness of these customs reforms is more impressive when compared with the lack of change in the port which has yet to computerize its cargo handling activities. Furthermore, the estimated amount for paid for an export container as speed money for the dockworkers is about twice the informal payments to customs officials.

¹⁶. This will be competitively bid shortly with the support of IIFC

Despite these improvements, the documentation that must be provided to customs is lengthy and must be submitted in hard copy. This should be reduced as the Direct Trader Input (DTI) data entry system operated by the Customs Agents is fully implemented. At present it is only used for exports and temporary imports but will be expanded to imports.

While most of the reforms have focused on imports and temporary imports, there have also been reductions in the clearance times and informal payments for imports. The PSI (Pre-shipment Inspection)¹⁷ system for non-governmental cargoes helped to reverse an unprecedented increase in level of informal payments as well as an increasing average time for clearing cargo, however, the informal payments remain a problem. It simplified inspection procedures reducing the average time to clear cargo that has proper documentation from 10 days to five days (Figure 5). However the full advantages has yet to be realized. Even with very accurate CFRs (Clean Report of Findings,¹⁸ Customs continues to check 5%-10% of the shipments that have a CRF and up to 100% of the packages in these consignments.¹⁹ The threat of such an inspection is sufficient to elicit the desired informal payments linked to the value of the cargo.

Figure 4 :Flow Chart for Temporary Imports



Source : Tera Intl

So far the implementation of these reforms and supporting computerization have been limited to the Port of Chittagong, the ICD in Kamalapur, the airport customs in Dhaka, and land customs station in Benapole. They are now being implemented in Mongla port and it is expected that that they will eventually be extended to the road and rail border crossings and reduce delays at these crossing points.

¹⁷ The three PSI companies are Bureau Veritas, Intertech Testing Corporation, and Inspectorate Griffith (part of British Standards Organization)

¹⁸ This is despite the documented accuracy of the CFRs issued by the PSI system.

¹⁹ Formerly they inspected all shipments but only 10% of the packages in each shipment

Major Initiatives

Bangladesh has successfully developed a world-class garment export industry as well as smaller but successful exports activities in ceramics, vegetables and shrimps. This success has been achieved through concerted efforts to adapt existing infrastructure, services and procedures to the demands for efficient and reliable supply of inputs to production and delivery of products to the world market. The demand for further reductions in cost and time of supply chains and for additional flexibility and reliability in delivery of goods to the market continues unabated in Bangladesh and other exporting nations. The difficulty is that the returns to these adaptations are diminishing.

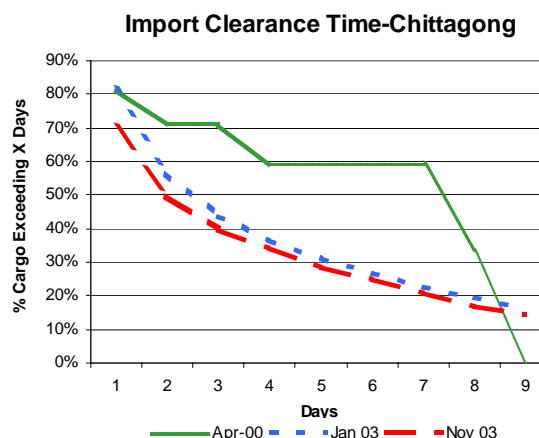
Additional investment is required in all modes of transport to remove capacity constraints and increase throughput. However, the changes most immediately required are modifications of policies, processes and management rather than capital investment. Even in the area of capital investment, there is a need to look more systematically at the problems of delivery of transport services from a corridor perspective and to plan investments so as to improve overall performance not just the performance on a specific link of a specific mode.

A list of priority initiatives to improve logistics services for both importers and exporters was developed based on discussions with manufacturers, third party logistics providers, and government agencies involved in trade and logistics. From this list, a subset was selected based on the likelihood for successful implementation in the next few years and the expected short-term benefits. These five initiatives listed in order of priority are shown in the Table below.

Table 6: Recommended Action for Improving Bangladesh Logistics

Initiatives	Action	Time Frame
1. Reform container terminal operations in Chittagong Port	Concession or Operating Lease	Start within 6 months
2. Establish bonded warehouses and ICDs/Dry Ports,	Liberalize customs procedures for establishing bonded warehouses	Within One year
3. Continue Customs reforms with greater emphasis on imports	Implementation of Asycuda ++ modules for selectivity and risk management. Introduce full EDI	Ongoing, 3 years
4. Increase capacity in the Dhaka-Chittagong Corridor	Road widening, Improve Rail Operations, Selected double tracking	Continuous
5. Improve Benapole-Dhaka Corridor performance	Simplify customs procedures, Increase cross-docking	One year

Figure 5



Port Reform

The conversion of Chittagong Port from a general cargo port that handles containers inefficiently to a modern container terminal requires a change in management style and labor practices as well as the introduction of substantial IT and commercial incentives. These change cannot be achieved by simply modifying an organogram, re-engineering an organization or providing training in equipment operations and computer systems. Such modifications would be appropriate for an operation involving a smaller volume of containers, making a gradual transition to a straddle carrier or reach-stacker operation. However, this is not the situation. The CPA is handling 600 thousand TEU and this is expected to increase to 750 thousand in the next few years. It has procured some extremely sophisticated equipment and supporting computer systems. All this must be put into operation within a year. This type of operation requires technically sophisticated, commercially oriented managers. It also requires equipment operators working to well developed operational plans not casual labor responding to the incentives of speed money. However, the CPA proposes to institute these changes without making any fundamental change the style of management or the relationship with labor.

Without such changes, the berth handling rates is likely to initially increase to 15-20 boxes per crane hour but then fall to 10 boxes per crane hour as yard congestion increases. The RTGs will increase the storage capacity of the yard by increasing storage height but it will reduce yard productivity by requiring many move box moves to access a box in the stack. The resulting yard congestion will add to the time required to receive outbound boxes and to deliver inbound boxes both to customs for inspection and to road chasses for removal from the terminal. Also the dwell time in port is unlikely to change. In this situation, the feeder services may be able to reduce their voyage time by 1-2 days, but the uncertainty of the time in Chittagong will remain and day-of-the-week schedules will not be possible.

That the need for a fundamental change in management structure has already been recognized in the proposal for a private concession to develop and manage New Moorings Container Terminal and the right of the concessionaire to recruit a skilled labor force. It is expected to take at least two years to introduce this concession and these are expected to be critical years for Bangladesh's export sector as buyers reassess their portfolio following the end of the MFA. Therefore, it is strongly recommended that a management contract with an experienced terminal operator be introduced to operate the existing container terminal. The CPA has already invested a significant amount in SSGs, RTGs and supporting equipment, so a large private sector investment is not required. Instead, skilled management and an arrangement with the dockworkers to reduce gang size and replace casual labor with trained equipment operators are needed. Since a multi-year management contract by itself would not provide a sufficient incentive to invest in the control systems and training necessary for efficient terminal operation, it is recommended that his agreement allow for conversion of this contract to a concession at a later time.²⁰

The benefits from such a change are expected to be on the order of \$100 million per year as follows:

Bonded Storage

Bangladesh has been successful in developing a number of EPZs and in providing bonded warehouse status to factories producing for export. It now needs to develop supplemental bonded facilities that will further reduce the cost and time for delivery of imports used in the production of exports. These facilities would include:

²⁰ Such a strategy while not being as effective as a concession can be used where government is not prepared to allow private sector management of public infrastructure. This was the situation in Jordan's recent decision to allow private operation of the container terminal in the Port of Aqaba following a sustained period of severe congestion and shipping line surcharges.

- Off-Dock Container Yards for Inbound Containers - While there is a provision in the regulations to allow the Off-dock yards to handle inbound containers, Customs has so far restricted their operations to outbound containers. This needs to be addressed as quickly as possible in order to reduce yard congestion.
- Rail ICD near Tongi - The existing Dhaka rail ICD in Kamalapur operates more efficiently than the container yard in Chittagong Port suffers from a congested access and lack of storage area. Also it would be more effective if located near the importers' factories with good road access for trucks.
- Road ICDs to the Southeast and Northwest of Dhaka - A road ICD would allow containers to travel by truck in bond from Chittagong to Dhaka, to be cleared by Dhaka customs officials and to move directly to the importers' warehouse or factory. It would also allow for storage of empty containers, which could then be stuffed with export cargo or returned as empties to Chittagong. The results would be a dramatic increase in port-to-door and factory-to-port movements of containers thereby reducing delays, cargo damage, and empty backhauls.
- A common-user customs bonded warehouse - There is no facility for traders or suppliers to store fabric and spun yarn without paying duty and other taxes.²¹ Relatively few garment manufacturers are willing to take the risk of maintaining a large inventory of fabric. At the same time, in order to remain competitive they must reduce their order cycle time. Traders and suppliers could perform this service but only if they were able to avoid store these goods in bond. Such an arrangement would reduce the order cycle time for woven garments by one month.

The benefits from the introduction of additional customs bonded warehouses will be to reduce the time for inbound and outbound logistics for the garment industry with savings in order cycle times of 2-4 weeks. This would also create an additional incentive for assembly and other export oriented production to expand production

Customs Clearance Procedures

Bangladesh's efforts at customs reform have been most successful for exports and temporary imports used to produce exports. On-going efforts to introduce the trade facilitation models in Asycuda ++ promise to further reduce the time, uncertainties and informal payments associated with clearing these cargoes.

The time and informal payments for imports have also declined but remain a problem. Informal payments to Customs are set according to the value of the cargo and are collected through the implicit threat of inspection using their discretionary power. At the same time, Customs officials themselves are under pressure to meet monthly revenue targets prescribed by the NBR, without consideration of how these targets are met. While Customs has been able to reduce the clearance time for imports with proper documents to an average of 2-3 days, the clearance times remain uncertain and the level of corruption unacceptable.

The government has quite wisely focused its reform efforts on exports with a view towards improving the competitiveness of the export industries. Efforts to reform the procedures for imports were delayed as they represent a substantial threat to the income of many of the customs officials. With the demonstrated effectiveness of these reforms, it is appropriate to increase efforts to reform the procedures for clearing import cargo. ASYCUDA based systems for channel selectivity and/or risk management can be introduced to reduce inspections and Direct Trader Input systems can be used to reduce the number of signatures required.

²¹. The duty drawback system is dysfunctional with long delays, informal payments and the risk that refunds will not be paid

The benefits of these reforms will be a reduction in delivery times for imports but more importantly greater reliability of delivery times and a reduction in the amount of and opportunity for informal payments.

Railways Container Service

The container unit train operation between Chittagong and Dhaka has the potential to provide an important benefit to both importers and exporters in the Dhaka area. While there are some operational problems with the yard layout and procedures in Chittagong and Kamalapur and with the availability of rolling stock, these are much less important than the failure to provide sufficient train frequency and to operate in a commercial manner. The existing service is nearly fully utilized but Bangladesh Railways is reluctant to add additional service as this would require eliminating some loss-making passenger services or tightening operations on some of the more congested links.

Underlying the reluctance to introduce additional services is a management style of a public monopoly. There is no incentive to expand service since by limiting train frequency BR can charge a high tariff without changing current operating practices. BR is supposed to operate in the public interest, but the government has made no attempt to determine the benefits from reducing road traffic by increasing the freight rail services. Nor has any thought been given to the effect of adjusting prices to encourage the use of freight services.

As experience with India's Concor clearly demonstrates, efficient rail transport of containers requires commercial management, if not by the private sector then by a corporatized body operating along commercial lines.²² Concorp is part of Indian Railways but operates as a separate for profit corporation run along commercial lines. It provides rolling stock financed through the World Bank. It provides unit train service with rail ICDs stretching across the country and currently handles about 1.4 million TEU per year. It has demonstrated a willingness to open new markets, such as Nepal's Rail ICD and various joint ventures with private transport companies. It has also expanded service where there was sufficient growth in demand. At the same time, it has stopped service where traffic has not materialized. Currently it operates a number of unit trains daily to and from various ports, most notably Nhava Sheva and Kolkata.

Benapole Land Port

A number of options are available to minimize the additional cost and time associated with the trucks and cargo crossing the land border to Petrapole/Benapole. The best option would be to permit sealed containers or vans to move under bond between Dhaka and Kolkata. This would require a bilateral arrangement that incorporates a regional licensing scheme, a guarantee for duties and taxes and payment of a transit fee. The second best would be to allow a trailer exchange or a cross-docking operation at the border for a bonded movement between Dhaka and Kolkata. These movements can be time-bound to prevent tampering.

Since these improvements are unlikely to materialize in the short term, a minimum effort would be to simplify clearance procedures on both sides of the border. This should eliminate the queues at both Benapole and Petrapole and greatly reduce the level of informal payments. The savings in transit time are estimated to be in excess of one week for a trip that without these delays would only take 3 days crossing.

²² There are some examples of public railroads successfully operating high volume container train services, e.g. South Korea's Pusan-Seoul service, but these are generally correlated with strong government policies promoting this service.