Chapter 1
INTRODUCTION

1.1. SHIPBUILDING INDUSTRY

Shipbuilding is the construction of large vessels which sail on seas, lakes or rivers. It normally takes place in a specialized facility known as a shipyard. Shipbuilders, also called shipwrights, follow a specialised occupation that traces its roots to before recorded history.

Many different approaches have been used in the construction of ships. Sometimes a ship must be custom-built to suit the particular requirements of a low-volume trade route with unique cargo characteristics. On the other hand, there are many instances where a significant number of similar ships are constructed, providing an opportunity to employ procedures which take advantage of repetitive processes.

1.1.1. GLOBAL SHIPBUILDING INDUSTRY

The global shipbuilding industry is currently dominated by South Korea, which is by far the world's largest shipbuilding nation in terms of tonnage and number of vessels built, in spite of high labour cost, producing more ships than the entire rest of the world's output combined in 2008 as per Table 1-1. This is largely due to its advanced shipbuilding technology, high productivity and efficiency of Korean shipyards.

Table 1-1 – World shipbuilding completions by countries

Country	2006		2008	
	10,000 GT	%	10,000 GT	%
South Korea	1,900	36.5%	1,240	50.6%
China	800	15.3%	840	34.4%
Europe	500	9.6%	140	5.7%
Japan	1,800	34.5%	90	3.7%
Rest of world	200	4.1%	140	5.6%
World Total	5,200	100.0%	2,450	100.0%

Data Source: Metal Network Korea Company (2009)

The world's largest shipyard in Ulsan, operated by Hyundai Heavy Industries, is so efficient that a new $80 million vessel slips into the water every four working days (Brooke, 2005). South Korea's "Big Three" shipbuilders, Hyundai Heavy Industries, Samsung Heavy Industries, and Daewoo Shipbuilding & Marine Engineering, dominate global shipbuilding. Also other Korean yards namely STX Shipbuilding, Hyundai Samho Heavy Industries, Hanjin Heavy Industries and Sungdong Shipbuilding & Marine Engineering also ranking among the top ten shipbuilders in the world.

China is a fast emerging shipbuilder and poised to overtake South Korea in the distant future but is mainly producing low-cost basic vessels at the moment, while Japan lost its leading position in the industry to South Korea in 2004, and its market share has fallen sharply. The entire European countries' total market share has fallen to only a tenth of South Korea's and the outputs of the United States and other countries have become negligible (Brooke, 2005).

1.1.2. LOCAL VESSEL BUILDING INDUSTRY

Sri Lanka, being a small player in the global shipbuilding industry, has recently entered in to the international shipbuilding market. Colombo Dockyard PLC (CDPLC) delivered several Anchor Handling Cum Supply Vessels (AHTS), the first Sri Lankan set of AHTS vessels delivered to international market, to Greatship India Ltd.

As at 2008 financial year end, net order book of shipbuilding business of CDPLC stood at US$ 172.5 Mn with completion and deliveries until 2010. This includes contracts secured in 2007, amounting to US$ 71.4 Mn. The business expects 2009 to be a better year than 2008 based on the schedule of the completion of projects (Colombo Dockyard PLC, 2008).

Also the shipbuilding revenue of CDPLC has been growing well since 2002/2003 period and the following Figure 1-1 illustrates this steep growth and the trend.

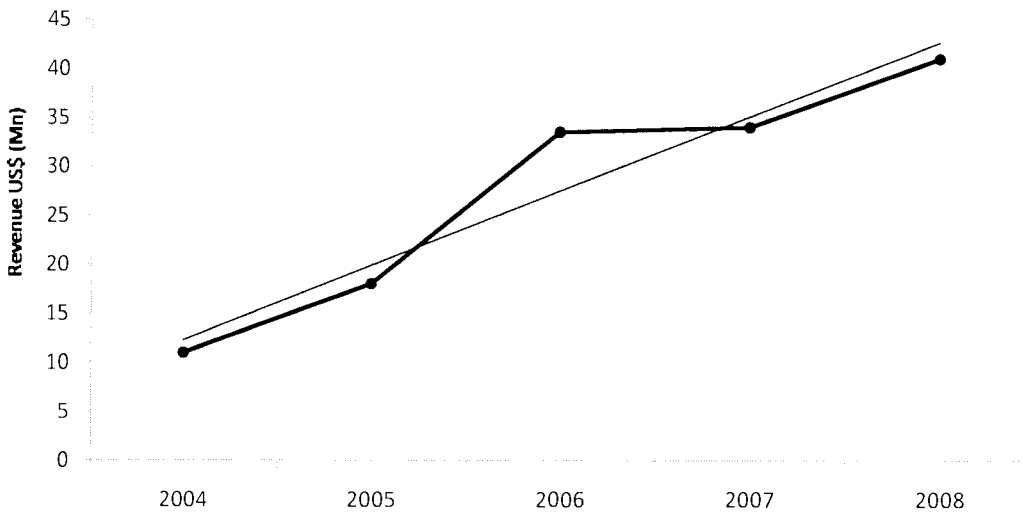

Figure 1-1 – CDPLC shipbuilding revenue
Data Source – CDPLC Annual Report (2008)

Likewise, CDPLC is the market leader in Sri Lanka and having a 100% market share and the monopoly in most types of vessels built for international market. In 2008 CDPLC delivered no product to the local market. The types of vessels built by CDPLC so far have been included in Table 1-2;

Table 1-2 – Product portfolio of CDPLC

STEEL HULL VESSELS	ALUMINIUM HULL CRAFT
80 Ton Bollard Pull Anchor handling Tug	Ultra Fast Attack Craft
45/58/65 Ton bollard pull berthing tug	40 m Offshore Patrol Vessels
10 Ton harbour tug	Coastal Surveillance Vessels
150 Passenger vessels	Fire Fighting Vessels
26/29 m landing craft	Fast Landing Crafts
Steel pilot launches	30/33 m Crew Boats
	35/40 m Fisheries Protection Crafts

Source: Survey findings

The other players in the industry include the boat builders of mainly leisure type and fisheries craft. There are many individuals and / or small boatyards and there is only a few established organisations exist. Among them Neil Marine (Official website: www.neilmarine.com) has an approximate market share of 65-70% and is the market leader when the ***local market*** is considered. Neil Marine is currently exporting 41-50% of

their products to regions such as Southeast Asia, Africa, Mid East, Eastern Asia and Western Europe. Neil Marine is currently among the leaders of boat builders of the south Asian region as well (Alibaba.com Limited, 2009).

The product portfolio of Neil Marine includes Fishing Boats, Commercial Types (23 m Supply Boat & 23 m passenger boat), Leisure (5 Models), 3 Yacht types and two specialised boats. Apart from Neil Marine, the major player serving to the local market is Cey-Nor Foundation. It has an annual turnover of approximately 0.8 Mn US$ and mainly building small fishing boats.

The other major player is Jostein Viksund Design & Model Centre (Pvt) Ltd which has its headquarters in Norway. They are specialised in Leisure / sport or cruising type and small fibreglass boats with high quality. They are mainly serving to the Scandinavian markets with an approximate annual turnover over 2.5 Mn US$ at 2008.

Viksund Asia was established as a BOI Company in Sri Lanka for the production of small and middle size pleasure boats for export market. In 2004, Viksund Design and Model Centre was established for developing and designing of boat moulds. By 2008 Viksund Design and Model Centre had 100 to 110 well trained Sri Lankan employees and produced nearly 500 boats per year for exports (Daily News, 2008).

The following Table 1-3 summarises the approximate market shares of local industry for boat building, depending on the outcomes of the questionnaire survey and information available online. However, as specified in the scope of this study, the other minor boat builders (mainly individuals and small boat yards), who cater to the local community, were disregarded.

Table 1-3 – Approximate market shares of local boat builders based on year 2008 (excluding CDPLC)

ORGANISATION	AVG. SALES (US$) Mn	MARKET SHARE (Approx.)
Neil Marine	1.10	25.4%
Cey-Nor Foundation	0.73	16.9%
Viksund Group	2.50	57.7%
TOTAL	**4.33**	100.0%

Data Source – Research findings, Daily News (2008) and Alibaba.com Limited (2009).

When it comes to the product portfolio, the following table (Table 1-4) gives the **aggregate view** of boats/vessels built by local manufacturers, regardless of the raw material used for hull construction. Except CDPLC, the other boat builders mainly use fibreglass as their main raw material. CDPLC uses only steel or Aluminium for hull construction, but there are some exceptions for non-commercial purposes.

Table 1-4 – Vessel / boat type by builder – Local industry

Vessel / Boat Type	Organisation			
	CDPLC	Neil Marine	Viksund	Cey-Nor
Harbour Tugs	✓			
Anchor Handling cum Supply Vessel	✓			
Small Passenger Craft	✓	✓		
Fast Attack Craft	✓			
Coastal Surveillance Boats	✓	✓		
Fire Fighting Vessels	✓			
Fast Landing Crafts	✓			
Crew Boats	✓	✓		✓
Fisheries Protection Crafts	✓			
Small Supply Vessels		✓		✓
Yacht		✓	✓	✓
Leisure & Sport Boats		✓	✓	✓
Fishing Boats		✓		✓
Specialized Boats		✓		

Data Source –Research findings

Table 4-5 summarises the overall market of the local vessel building industry when CDPLC also taken into account. There, CDPLC has approximately 90% of market share of the local vessel building industry and therefore it's the leader of the local industry.

However, Sri Lanka is trying to enhance its shipbuilding capacity with the government inviting foreign investors to set up a ship yard at a new port being built in the south (Your Shipbuilding News, 2009). Port of Hambantota, which is currently under constructions, is planned as a service and industrial port and subsequently it could be developed as a transhipment port depending on the increasing cargo volumes.

In view of urgency, short term plan has been prepared for a service port as phase 1 of the project in order to cater for the immediate demands in accordance with the master plan. The Main components are two numbers of berths with 500 m length and the breakwater of about 1.8 km. The proposed port will have depth of 15m. Also the major players in the region already have confirmed their participation in providing docking facilities at Hambantota port (SkyscraperCity Forums, 2009).

1.1.3. REGIONAL SHIPBUILDING INDUSTRY

The south Asian region has a considerable market share in global shipbuilding. There are many shipyards carrying out shipbuilding and / or ship repairing, lead by India. Table 1-5 shows the Number of Shipyard located in the neighbouring countries of this region.

Table 1-5 – Shipbuilding or ship repairing yards count by county

Country	Number of Shipyards	Remarks
Bangladesh	19	
India	38	32 yards are shipbuilders
Pakistan	36	
Thailand	19	
Sri Lanka	1	

Data Source – Wikipedia, the free encyclopedia (2009)

India is the emerging leader in the south Asian region and it's believed that it would capture a considerable market share in global shipbuilding in the future. Currently, India is having nearly a 1.24% market share from the global shipbuilding industry (Research and Markets, 2009).

At present the central government of India is planning to invest considerably in shipbuilding industry to set up another two shipyards. Also India's share of the global shipbuilding market is expected to increase to 5% by 2020 from the current 1.24% (Narasimhan, 2008). India is also experiencing the severe competition from Chinese shipyards that have a major advantage due to lower labour cost, i.e. approximately 729 USD per worker per annum as indicated in Table 1-6.

Table 1-6 – Labour rates of Asian region

Country	Labour cost per worker (US$ per annum)
China	729
Indonesia	1,008
India	1,192
Philippines	2,450
Thailand	2,705
Malaysia	3,429
Korea	10,743
Singapore	21,317

Source: Equitymaster Agora Research (2007)

Likewise, the Indian shipyards are having huge economies of scales when compared to CDPLC and they are enjoying super profits as well. Table 1-7 describes some of the statistics of major Indian Shipyards during 2006/2007 period and it's evident that Indian shipbuilding industry is very attractive due to high turnover, profit and orders.

Table 1-7 – Statistics on Indian shipyards

Name of Shipyard	2006-2007		Order Book As at 2008	
	Turnover INR Mn	Net Profit INR Mn	INR Mn	USD Mn
Cochin Shipyard	7,200	580	20,000	429.64
Hindustan Shipyard	7,500	780	20,000	429.64
Bharati Shipyard	-	1,070	46,353	995.76
ABG Shipyard	-	1,607	111,000	2,384.50
Pipavav Shipyard	-	-	51,006	1,095.71

Data Source: Narasimhan (2008)

1.2. RESEARCH BACKGROUND

The recent financial crisis in the global economy has created ripples in most industries, especially in Shipbuilding & Freight due to the fluctuations in international trade. Through historical figures, it's apparent that it will take a few years to recover the negative impact created by the economic crisis or recession and until such time, the growth of the shipbuilding and other seaborne industries would be shrinking or standstill.

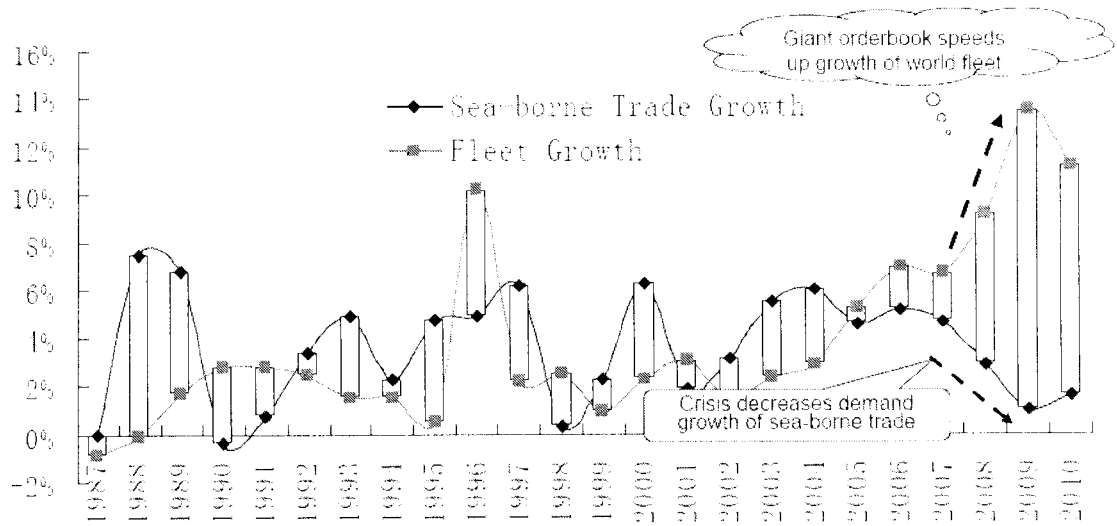

Figure 1-2 – Balance between seaborne trade and world ship fleet
Source: China Shipbuilding Economy Research Centre (2008)

Nevertheless, due to the record breaking order book for shipbuilding for 2008/09, the world ship fleet growth will continue even though there is no actual demand to them due to the deterioration of international trade and this will create a surplus of newbuildings against the demand (Figure 1-2). To be precise, there exists a strong positive correlation between new orders and freight rates; the downtrend of freight would directly make the newbuildings requirements less in the following years.

Figure 1-3 illustrates the forecast for the newbuildings in the next few years globally.

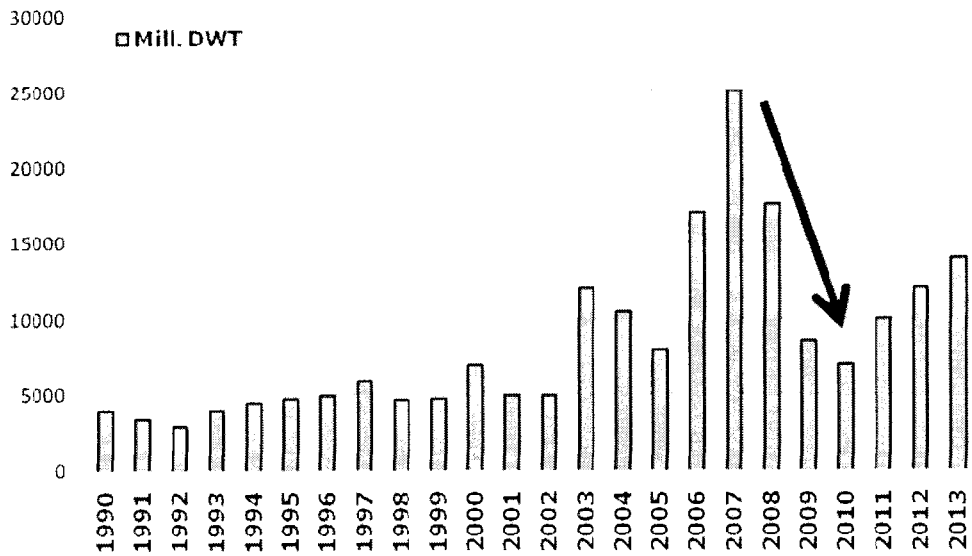

Figure 1-3 – Forecast for newbuildings
Source: China Shipbuilding Economy Research Centre (2008)

As the financial crisis swept the world in 2008 is much serious than Asia crisis in 1997 and thus the world economy may need more time to recover. It is forecasted that it will take 3-4 years to fully recover the recession (China Shipbuilding Economy Research Center, 2008).

1.3. RESEARCH PROBLEM

Colombo Dockyard PLC (CDPLC), as a leading shipbuilder in the South Asian region, has a considerable number of orders (confirmed and prospective) up to 2010. However, the ship purchasers are now negotiating and reconsidering about their orders due to the difficulty of chartering the ships once built. This considerably affects to CDPLC, other regional shipbuilders and even the small seagoing craft builders in Sri Lanka for their existence in next few years, until the world economy recover from the recession.

The balance of the shipbuilding market would be changed from capacity insufficient to capacity surplus in next few years. This will convert the shipbuilding market from a seller's market to a buyer's market, creating a high competition among the existing vessel builders.

Due to the low cost model (*when compared to the shipbuilders in the developed countries*) adapted by CDPLC with unbeatable delivery times, there is a high potential to overcome the crisis situation remarkably well and achieve a considerable growth or maintain the same level during or soon after the recovery. Since the market is rapidly converting into a Buyer's Market with the newbuildings surplus, having a competitive edge in the regional market is at paramount importance for survival & growth at this stage.

Hence, it's essential to identify the Market Dynamics, Key Success Factors, Competencies and Strategies to achieve competitive advantage and more customer value addition for CDPLC and other Sri Lankan seagoing vessel builders, backed by national policies to become sustainable in this industry.

1.4. OBJECTIVES

The main objective of this research is to propose strategies and policies to be implemented by local vessel builders, including Colombo Dockyard PLC and policy makers to promote Sri Lankan seagoing vessel building industry, depending on the outcomes of the current situation of the local & global industry and economy.

The objectives of this research are;

1. Analyse the present situation of Seagoing Vessel Building Industry of Sri Lanka with special emphasis on Colombo Dockyard PLC (***Situational Analysis***).
2. Assess the ***Sustainability*** of the local Seagoing Vessel Building Industry amidst the growth of Sri Lankan economy in terms of ***Technological, Economical, Socio-Political and Environmental*** factors, with special emphasis on Colombo Dockyard PLC.
3. ***Recommend Strategies and Policies*** to promote Seagoing Vessel Building Industry as a main contributor for Sri Lanka's economic growth and development.

1.5. SIGNIFICANCE OF THE STUDY

As per the statistics of the Department of Census & Statistics of Sri Lanka, Shipbuilding / repairing industry is not a major industry in Sri Lanka at the moment (Department of Census & Statistics - Sri Lanka 2008). However, this industry is globally a multi-billon dollar industry which drives international trade, produces many huge vessels annually with new knowledge and advanced technology. *Hence, it's essential to conduct research in this area to boost this industry to global level.*

The current global economic downturn affects sea-born industries and international trade. Already some shipyards are about to close due to non-availability of new contracts for shipbuilding. Some ship owners are considering even to cancel the orders that have been placed already due to the difficulty in finding an organisation to charter the ships. *Hence it is needed to identify how to face & sustain in the global economic downturn, as the industry.*

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During the efforts of surviving and developing the industry, it is a must to identify the current status of the local industry with respect to the global scenario in terms of technology, competitiveness and value addition to the customer. *Thus situational analysis of the local industry is very important for development and formulation of policies and strategies.*

Korea is already the number one player in the global industry with giant shipbuilders. They have right technologies as well as right strategies to further sharpen the competitive edge of their industry. Also, China and India are fast advancing with their low cost products and somewhat advanced technologies when compared to Sri Lanka. However, it's predicted that China will become the number one player in the industry within a few years surpassing Korea and India also will have a steep growth meantime. *Hence, Sri Lankan industry needs to face the severe & growing competition from the region, Korea & China with appropriate strategies.*

Colombo Dockyard PLC (CDPLC), being accounted for around 90% of the local vessel building industry and the only player delivering ships to international market, also has to *thoroughly review their status in the local and global scenario and identify its Strengths & Weaknesses and seek the ways to improve the local industry inline with their growth to build a sustainable future.*

Korea and the fast developing South-East Asian countries achieved all their development and technology mainly due to the government support and the right national technology / industrial policies implemented by them. *Sri Lanka also is in dire need of a National Technology / Shipping Policy to develop the industry and obtain government support as well as for transferring advanced technologies into the local industrial community.*

1.6. RESEARCH METHODOLOGY

The first step was secondary data collection by desk research on the industry, its current status and the technologies used by the key players in global shipbuilding industry & locally. Likewise, the existing national policies of the other countries in this region also

were studied in order to identify suitable policies for Sri Lanka to implement and adopt to enhance the local technology and shipping related industries.

Primary data collection was carried out using interviews and questioners form;

- Senior management of key players in the industry
- Industry experts and other stake holders including customers and suppliers

Two questionnaires were used here. One was to assess the operating environment (industry forces) of CDPLC & other minor players and the current market situation of the local vessel building industry using the Porter's five forces model (***situational analysis***).

The second questionnaire was used to ***assess the sustainability*** of the local seagoing vessel building industry in terms of Technological, Economic, Socio-political and Environmental factors, based on the conceptual model developed by the researcher and presented herein.

A SWOT analysis followed by a value chain analysis was carried out on the local vessel building industry with special emphasis on CDPLC to assess the current business process and to identify the most value adding and non value adding activities in the industry.

The final stage of this study was to suggest strategies to be implemented mainly by CDPLC to enhance its business process and to become competitive in the international market towards a sustainable growth. The policies to be implemented by the government also were suggested in order to enhance the industry as a whole.

1.7. RESEARCH SCOPE AND LIMITATIONS

This research mainly covers the sea going vessel building industry with special emphasis on CDPLC and its business process. That includes all the types of vessels (newbuildings) built by CDPLC and the activities and strategies involved in that process. Typically, these vessels include from small Pilot Launches (14 m long), Fast Attack Crafts for military and surveillance purposes (range 24-40 m), Tugs, Anchor Handling cum Supply Vessels (1,500 DWT, 63.4 m) and to larger Passenger Vessels (around 250 Passengers).

However the DWT of the biggest ship delivered so far by CDPLC or any other local shipbuilder when compared to the largest ship (564,650 DWT, 458.45 m) in the world is only 0.27% and therefore it is negligible. A sample ***length*** comparison is shown in Figure 1-4 for better understanding. Hence the scope of this study is limited for very small scale vessels and boats with respect to global context.

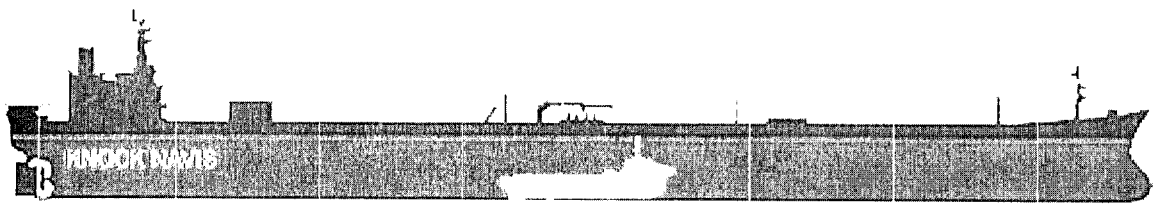

Figure 1-4 – Comparison of ship lengths, CDPLC against the world

Also, this research does not cover barges and other types flat-bottomed boats, built mainly for river and canal transport of heavy goods and any non self-propelled vessels are also disregarded.

In addition to that, only the selected established organisations, who are currently engaged in designing and manufacturing of small seagoing vessels using fibreglass or similar materials either for local or foreign leisure type or fishing activities, are covered. The sizes of the vessels built by these organisations are within 20 m range and most of them are manufactured using fibreglass.

Since most of the small vessel builders are not established organisations (rather a few individuals or workshops carrying out vessel building to cater very niche markets or individual needs) they are ignored due to difficulties in obtaining feedback and time restrictions. Hence, only the industry major players, which are established organisations, are to be researched.

Also this research does not cover the conventional types of boat building for fishing activities or river / canal transportation. Only the vessels / boats built using modern manufacturing technologies with a professional design / manufacturing approach by the established organisations for commercial purposes are considered.

During the literature survey, all the major Naval and maritime institutions and academies in Sri Lanka were inquired (including *Naval and Maritime Academy - Trincomalee Naval Base, Colombo International Nautical & Engineering College (CINEC)* and *Lanka Academy of Technological Studies (Pvt) Ltd*), but no previous management research on shipbuilding or boat building industry was found for reference. However ample number of reports / researches were found for global shipbuilding industry, but some of them were not accessible due to very high cost of purchasing for a student research.