YANGON UNIVERSITY OF ECONOMICS
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A STUDY ON CUSTOMERS' PERCEPTION OF INLAND WATER FERRY TRANSPORTATION IN YANGON REGION

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A STUDY ON CUSTOMERS' PERCEPTION OF INLAND WATER FERRY TRANSPORTATION IN YANGON REGION

A thesis submitted in partial fulfillment of the requirements for
the degree of Master of Public Administration (MPA)

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This is to certify that this thesis entitled **"A STUDY ON CUSTOMERS' PERCEPTION OF INLAND WATER FERRY TRANSPORTATION IN YANGON REGION"** submitted as a partial fulfillment towards the requirements for the degree of Master of Public Administration (MPA) has been accepted by the Board of Examiners.

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ABSTRACT

Inland Water Transportation, also known as the water-ferry service that is important for the welfare of the public, has been considered as cost effective, relative to consuming fuel efficient, friendly to environment. Public users of ferry transportation can be more convenient and committed for totally safety travelling by managing the ferry routes as a systematic public transportation. This study focused on the customer's perception of ferry transportation provided by Inland Water Transport Department (IWT) in Yangon Region, Myanmar. Descriptive analysis was mainly applied, qualitative approach in time-series data was also used by available information and survey with structured questionnaires are used to collect the data from 350 respondents by the way of simple random sampling method. The study indicates that most of users are in the lowest level of education, the lowest level income-group, the basic level of occupation and most of respondents are depending upon the ferry services. The most of the respondents' perception is the strong recommendation and satisfaction for ferry service of Inland Water Transport because of getting the expected service. And obviously observed that the pricing of tickets should be based on the cost of each routine of inland water ferry transportation in Yangon region. Insurance, one of the social protections to cover risk for the passengers, is needed to manage by Inland Water Transport Department. As the limitation in roads, bridges, railways and airways bring towards the travelling by waterways, inland water transportation is still an essential to local people in Myanmar.

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LIST OF ABBREVIATIONS

ASEAN	Association of South-East Asian Nations
CO_2	Carbon dioxide
CSO	Central Statistical Organization
DWT	Death Weight Ton
ESCAP	Economic and Social Commission for Asia and the Pacific
FY	Fiscal Year
IWT	Inland Water Transport
IWTS	Inland Water Transport System
LPDR	Lao People's Democratic Republic
Ro-Ro	Roll on-Roll off
SEA	South East Asia
USD	United State of America Dollar
YMC	Yangon Machinery Corporation

CHAPTER I
INTRODUCTION

1.1 Rationale of the Study

Transportation is essential for the smooth of flow of goods and services from one place to another as well as for people to reach their desired points of location. In this modernized area, various types of transport modes are available. These are road transport, maritime transport, air transport and other modes of transport such as pipeline, cable, etc. These transport modes are different ways to perform the transfer of people as well as goods.

Transportation plays an important role in the development of a region as well as a country. Without the development of transportation sector, the region cannot be developed. Thus, transportation needs to be improved so as to fulfill the need of the region. In recent years, there has been well known the need of promoting sustainable development and better transportation in order to bring about the sustainable development of transport system and policies.

Myanmar is well endowed with natural river resources. The Ayeyarwaddy, Chindwin, Thanlwin and Sittaung Rivers are flowing from north to south and the north south direction of the mountain ranges of Myanmar is reflected in course of river valleys running from north to south divided each other by mountain ranges and the plateau. Therefore, the inland waterways transportation in Myanmar will be better than other modes of transport in long term because it is the least cost transport for heavy and bulky cargoes, it has the capability of large amount of cargoes or many passengers in one time from one destination to another and it is also a fuel efficient and environment friendly mode of transportation. Comparison with cost of other transport infrastructure such as aviation, high way transport, it just need lower cost in infrastructure and scheduled maintenance of river routes.

Inland Water Transport has been considered as cost effective, relative fuel efficient, environment friendly and more employment generating mode of transport. Inland Water Transportation is the providing of river transportation services by

utilizing the facilities such as ships or vessels, barges, jetty and pontoons to optimize transport performance to meet public needs, carrying out passengers and cargoes in the navigable waterways and operating ferry services for the convenience of passengers and vehicles.

The river transportation service is also known as the ferry service that is important for the welfare of public in passing through the river for their way daily. The fares or ticket prices of ferry service are economical for passengers and vehicles; furthermore it is safe and convenient by arranging routes as public transportation which is operated by Inland Water Transportation Department (IWT). Therefore, there is a need to investigate the customers' perception upon the public ferry transportation and how much the customers have satisfied for this ferry transportation and how much they get benefits from using that.

One of the noticeable features of today's modern economy is the growing importance of service industry. Providing good service quality is great strategic importance in the management of any service organizations. Having good service quality is a source of competitive advantage while poor service quality can become a cost burden to the organization and also alienate customers.

Efficient transportation systems play a positive role both in the economic life of industrialized countries and the daily lives of their citizens. These countries realize the importance of the relationship between good systems and services and their economy. These transportation systems are essential to a modern society, and there are substantial economic benefits to be realized from them. The authority should try to know the customers' perception for the public transportation so that the transportation intend to welfare, effectiveness and how impacts are distributed to stakeholders. By studying customers' perception, the authority can efficiently manage or control the ferry transportation to get benefits for customer as well as safe for every routes of ferry.

1.2 Objective of the Study

The objective of the study is to study the customers' perception upon the public ferry transportation of inland water transportation in Yangon Region, Myanmar.

1.3 Method of Study

Descriptive analysis was mainly used in this study with primary data and secondary data. Primary data were obtained from the passengers, crews, staffs and officials, who were requested with the survey questionnaires as the respondents of the ferry transportation system in Inland Water Transport. Simple random sampling method was used in this study. In addition to survey, secondary data was conducted from Department of Inland Water Transport, Ministry of Transport and Communications, various publications, unpublished MPA thesis and concerning internet websites.

1.4 Scope and Limitations of the Study

The study focused on the customers' perception of water ferry transportation which was provided and managed by Inland Water Transport Department (IWT) in Yangon Region, Myanmar**.** In Yangon Region, there are three routes of ferry transportation operated by IWT. These routes are Pansodan - Dalla, Yangon-Khanaungto and Wahdan - Dalla routes. Primary data was collected from a sample group of 350 respondents relating with the ferry transportation of Inland Water Transport Department in Yangon Region. The four parts of questionnaires are used KAP styles and behaviour, awareness and perception. These respondents were interviewed with a questionnaire to attain the intended information. Time frame for the secondary data from Inland Water Transport Department (IWT) is coverage from 2007- 2008 fiscal years to 2017-2018 fiscal years. The limitations of the study areas are the ferry service of water transportation in public sector in Myanmar, the primary data are collected in the period between May to July of 2019, not included other modes of ferry services and inland water transportation private sector.

1.5 Organization of the Study

The study is organized into five chapters. Chapter one is about the introductory parts which include the rationale of the study, objective of the study, method of the study, scope and limitations of the study and organization of the study. Chapter two emphasizes the literature review that is composited with concept of transport, the contribution of transportation to economic development, transportation and economic development, top five ways transportation impacts of economic development, definition of water transport, and benefits of using inland waterway

transport, and Inland Water Transportation in South East Asian Nations. Chapter three mentions historical background of Inland Water Transport in Myanmar based on the data available. Chapter four describes the analysis of the customer perception upon the ferry transportation of IWT in Yangon Region. Finally, findings and recommendations were presented in Chapter five.

CHAPTER II
LITERATURE REVIEW

2.1 Concept of Transport

Transportation means the movement of humans, animals and goods from one location organism or thing from a point to another. Transportation includes air and land (from point A to point B). The action of transport is also defined as a particular movement of an rail and road, water, cable, pipeline and space etc. The transportation field can be divided into infrastructure, vehicles and operations. Transportation enables trade between people, which is essential for the development of civilizations.

Transport infrastructure includes the fixed installations, including roads, railways, airways, waterways, canals and pipelines and terminals such as airports, railway stations, bus stations, warehouses, trucking terminals, refueling depots (including fueling docks and fuel stations) and seaports. Terminals may be used in order to interchange of passengers, cargo and for maintenance. Traveling Vehicles on these networks may include automobiles, bicycles, buses, trains, trucks, helicopters, watercraft, spacecraft and aircraft.

The procedures are set for operations dealing with the way of the vehicles are operated; including financing, legalities, and policies. depending on the country and mode, operations and ownership of infrastructure can be either public or private in the transport industry, Passenger transport may be public, where operators provide scheduled services, or private. Freight transport has become focused on containerization, although bulk transport is used for large volumes of durable items. Transport plays an important part in economic growth and globalization, but most types cause air pollution and use large amounts of land. While it is heavily subsidized by governments, good planning of transport is essential to make traffic flow and restrain urban sprawl.

A mode of transport is a solution that makes use of a particular type of vehicle, infrastructure, and operation. The transport of a person or of cargo may involve one mode or several of the modes, with the latter case being called intermodal or

multimodal transport. Each mode has its own advantages and disadvantages, and will be chosen for a trip on the basis of cost, capability, and route.

Transport is a key necessity for specialization—allowing production and consumption of products to occur at different locations. Throughout history transport has been a spur to expansion; better transport allows more trade and a greater spread of people. Economic growth has always been dependent on increasing the capacity and rationality of transport. But the infrastructure and operation of transport have a great impact on the land and is the largest drainer of energy, making transport sustainability a major issue.

Due to the way modern cities and communities are planned and operated, a physical distinction between home and work is usually created, forcing people to transport themselves to places of work, study, or leisure, as well as to temporarily relocate for other daily activities. Passenger transport is also the essence of tourism, a major part of recreational transport. Commerce requires the transport of people to conduct business, either to allow face-to-face communication for important decisions or to move specialists from their regular place of work to sites where they are needed.

2.2 The Contribution of Transportation to Economic Development

Traditionally, measuring return on investment for transportation initiatives has focused on direct user benefits and the economic impacts that arise from those cost savings. Estimating minutes of travel time saved by passengers or freight is acceptable, but some projects require more exploration and depth. The reality is that transportation plays a broad role in shaping economies.

Though not all transportation projects generate such benefits, some investments are considered strategic drivers of development. The economic impact of transportation projects can be measured in the benefits they bring to economic growth, job creation, trade facilitation, and the economies of scale created. Recognizing this reality is crucial because today's transportation needs far exceed available funding. Accordingly, transportation agencies at all levels of government seek to maximize their investments.

This is true despite the fact that, in 2015, the Fixing America's Surface Transportation (FAST) Act was signed into law. Included in the $305 billion authorized by the FAST Act is funding for critical public transportation, highway, and

freight projects. There is an increased level of accountability in how transportation dollars are spent, so even with this money available, state, metropolitan, regional, and local agencies must justify the need, economic impact, and return on investment of their transportation investments. As such, it is important to assess transportation projects for their wider impact and use a sound economic analysis to make informed transportation decisions.(Dowell, 2017)

2.2.1 Transportation and Economic development

The interface between transportation investment and economic development has broad ramifications that go beyond transportation's basic purpose of moving goods and people from one place to another. Whereas there is no doubt that transportation is essential in the operation of a market economy, much still needs to be understood about ways in which an efficient transportation system can improve the productivity of the economy.(Eberts, 2017)

Like many economic activities that are intensive in infrastructures, the transport sector is an important component of the economy impacting on development and the welfare of populations. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment and additional investments. When transport systems are deficient in terms of capacity or reliability, they can have an economic cost such as reduced or missed opportunities. Transport also carries an important social and environmental load, which cannot be neglected. Thus, from a general standpoint the economic impacts of transportation can be direct and indirect. Direct impacts related to accessibility change where transport enables larger markets and enables to save time and costs. Indirect impacts related to the economic multiplier effects where the price of commodities, goods or services drop and/or their variety increases.

The impacts of transportation are not always intended, and can have unforeseen or unintended consequences such as congestion. Mobility is one of the most fundamental and important characteristics of economic activity as it satisfies the basic need of going from one location to the other, a need shared by passengers, freight and information. All economies and regions do not share the same level of mobility as most are in a different stage in their mobility transition. Economies that possess greater mobility are often those with better opportunities to develop than

those suffering from scarce mobility. Reduced mobility impedes development while greater mobility is a catalyst for development. Mobility is thus a reliable indicator of development.

Transportation links together the factors of production in a complex web of relationships between producers and consumers. The outcome is commonly a more efficient division of production by an exploitation of geographical comparative advantages, as well as the means to develop economies of scale and scope. The productivity of space, capital and labor is thus enhanced with the efficiency of distribution and personal mobility. It is acknowledged that economic growth is increasingly linked with transport developments, namely infrastructures but also managerial expertise is crucial for logistics.

Transportation developments that have taken place since the beginning of the industrial revolution have been linked to growing economic opportunities. At each stage of human societal development, a particular transport mode has been developed or adapted. However, it has been observed that throughout history that no single transport has been solely responsible for economic growth. Instead, modes have been linked with the function and the geography in which growth was taking place.

Transport, as a technology, typically follows a path of experimentation, introduction, adoption and diffusion and, finally, obsolescence, each of which has an impact on the rate of economic development. Water transport technology can be linked to economic development where a specific mode or system emerged:

(a) **Seaports-** Linked with the early stages of European expansion from the 16th to the 18th centuries. They supported the development of international trade through colonial empires, but were constrained by limited inland access.

(b) **Rivers and canals -** The first stage of the industrial revolution in the late 18th and early 19th centuries was linked to the development of canal systems in Western Europe and North America, mainly to transport heavy goods. This permitted the development of rudimentary and constrained inland distribution systems.(Jean-Paul Rodrigue and Theo Notteboom, 2017)

2.2.2 Top five ways transportation impacts of economic development

Transportation investment impacts of economic development in the following five ways are:

(a) supports clusters and agglomerations;

(b) increases productivity;

(c) enhances jobs and labour market accessibility;

(d) opens new markets for businesses; and

(e) enhances supply chain efficiency

(a) Supports clusters and agglomerations

Investment in transportation, especially transit, supports clusters and agglomerations in several ways. First, in large metropolitan areas, growth can be slowed when it is based only on automobile trips due to the limited downtown space. Effectively planned transportation can overcome this constraint and reinforce agglomerations by allowing more people to come closer together in higher density developments. Second, the right transportation investments sustain clusters of industries and businesses by supporting their closer proximity to each other, improving productivity and creating clusters of activities. Finally, efficient transportation reduces the time distance between the suburbs, where some of the labour forces lives, to the downtown areas.

(b) Increases productivity

When transportation improvements increase the accessibility of people and businesses to reach jobs, services, goods, and activities, productivity also increases. This uptick may be due to reduced travel time and infrastructure enhancements. Because the labour market temporally is brought closer to their places of work due to improved travel time, businesses experience gains in worker productivity. Business productivity is seen in other areas as well. For example, transportation improvements may improve freight delivery times. If truck drivers can reach their destinations more quickly, they can make more runs in their daily shifts, increasing their efficiency. Increasing worker and business productivity can in turn increase the productivity of the metropolitan area affected by the enhanced transportation system.

(c) Enhances job and labour force accessibility

Another economic benefit of transportation improvements is the resulting larger pool of employees available for the job market. This may come from a new transit or commuter rail line that makes it possible for employees to reach previously inaccessible jobs. Or, road improvements may decrease employees' travel time by car or bus. Overall, employers can better match employees with appropriate jobs based on the job requirements and employees' skills. At the same time, new or improved transportation options increase the population's direct access to more job options, making an area more attractive. Given the importance that Millennial place on mobility and desire to forego car ownership, access to employment and recreation in walk able, bike able and transit-accessible areas is becoming a key factor for recruiting this critical workforce group.

(d) Opens new markets for businesses

New and improved transportation options do more than decrease the travel time or distance for commuters; they can be a factor in shifting the business sectors attracted to the metropolitan area. Building a multi-modal facility opens new markets for companies searching for locations with the appropriate transportation infrastructure for their corporate needs and manufacturing plants. New rail, subway, and Metro lines attract new development — residential and commercial — providing businesses and passengers with more options to earn and spend their money. By improving access, enhanced transportation projects positively affect the economic impact of metropolitan areas.

(e) Enhances supply chain efficiency

When businesses are clustered together, it is easier and quicker for them to reach their suppliers and customers. This phenomenon has a positive impact on freight logistics and delivery scheduling. Easier access to needed supplies and materials and faster delivery times to customers can help lower transportation and inventory carrying costs while increasing both productivity and profitability. At the same time, improvements in the transportation infrastructure allow companies to expand their market reach and access to a larger customer base, which can increase their competitiveness. By improving

access to markets, goods and services, employment, housing, health care, and education while reducing the cost of moving people and goods, transportation projects can increase economic productivity and development. (Dowell, 2017)

2.3 Definition of Water transport

Water transport refers to movement of goods and passengers on waterways by using various means like boats, steamers, launches, ships, etc. With the help of these means goods and passengers are carried to different places, both within as well as outside the country. Within the country, rivers and canals facilitate the movement of boats, launches, etc. Since the goods and passengers move inside the country, this type of transport is called inland water transport. When the different means of transport are used to carry goods and passengers on the sea route it is termed as ocean transport. Let us know further about these two types of water transport.(Rai, 2010)

(a) Inland water transport

Inland water transport use boats, launches, barges, streamers, etc., to carry goods and passengers on river and canal routes. These routes are called inland waterways and are used in domestic or home trade to carry bulky goods.

(b) Ocean transport

Ocean transport refers to movement of goods and passengers with the help of ships through sea or ocean waterways. It plays an important role in the development of international trade. It is also used for transporting goods and passengers in the coastal areas. Ocean transport has its fixed route, which links almost all the countries of the world. Sea transport may be of the following two types.

(i) **Coastal Shipping** - In this transport, ships ply between the main ports of a country. This helps in home trade, and also in carrying passengers within the country.

(ii) **Overseas shipping** - In this transport, ships ply between different countries separated by sea or ocean. It is mainly used for promotion and development of international trade. It is economical means of transport to carry heavy machines and goods in bulk. Overseas transport is carried out on fixed routes, which connect almost all the

countries. In ocean transport, different types of ships are used to carry passengers and goods.(Rai, 2010)

2.4 Benefits of using inland waterway transport

It is a relatively economical mode of transport for bulky and heavy goods. It is a safe mode of transport with respect to occurrence of accidents. The cost of maintaining and constructing routes is very low as most of them are naturally made. It promotes international trade.(Singh, 2018)

Water transport has the following limitations. The depth and navigability of rivers and canals vary and thus, affect operations of different transport vessels. It is a slow moving mode of transport and therefore not suitable for transport of perishable goods. It is adversely affected by weather conditions. Sea transport requires large investment on ships and their maintenance.

Promoting a modal shift away from road transport to inland water transport can also generate safety benefits, as it may replace heavy goods vehicles which are responsible for a disproportionate amount of traffic accidents. For example in India, trucks represent only 5% of the total vehicle fleet, but are responsible for 26% of all road accidents.

According to Hans van der Werf, Secretary General, Central Commission for the Navigation of the Rhine, in inland water transport, the challenges faced in Europe, North America, and Asia are all the same. Even the solutions, to a larger extent, could be similar in one river basin compared to the other.

Furthermore, inland waterway transport also has the potential to support regional cooperation and integration, by creating a common transport route across several countries that share the same river. Some of the major issues facing Asian countries are similar to the problems that faced Europe and North America during the growth phases of their respective inland water transport sectors years ago.

If the experience is looked at with the waterway of Canada, the vice president of ADB explained Jean Aubry-Morin, Vice-President, External Relations, the St. Lawrence Seaway Management Corporation, which manages the major waterway serving Canada and the United States that moving from a private-type of investment and regulation environment to a more governmental-oriented governance framework was a major challenge.

The biggest difficulty was to create a regulating environment that was not too complex. The need was to standardize, harmonize and simplify the regulations to permit long-term investment, so that users can be able to manage risk and develop a sound economic development. (ADB, 2013)

2.4.1 Advantages of water transport

Water transport is the cheapest and the oldest mode of transport. It operates on a natural track and hence does not require huge capital investment in the construction and maintenance of its track except in case of canals. The cost of operation of water transport is also very less. It has the largest carrying capacity and is most suitable for carrying bulky goods over long distances. It has played a very significant role in bringing different parts of the world closer and is indispensable to foreign trade. The following are advantages of water transport:

(a) Larger Capacity: It can carry much larger quantities of heavy and bulky goods such as coal, and, timber etc. Heavy and bulky goods can be transported easily at little cost through water transport.

(b) Flexible Service: It provides much more flexible service than railways and can be adjusted to individual requirements.

(c) Safety: the ships are safe, secure, sustainable and efficient waterborne operations*:* The risks of accidents and breakdowns are minimum as compared to any other form of transport.

(d) Low Cost: Rivers are a natural highway which does not require any cost of construction and maintenance. Even the cost of construction and maintenance of canals is much less or they are used, not only for transport purposes but also for irrigation, etc. Moreover, the cost of operation of the inland water transport is very low. Thus, it is the cheapest mode of transport for carrying goods from one place to another.

(e) Cheap: The transport channel is quite cheap as compared rail and road Transport.

(f) Less Maintenance Cost: Maintenance cost in rail and road transport is quite high but maintenance cost of water transport is quite less.

(g) Useful during Natural Calamities: During natural calamities like flood and rains, when rail and road transport is disrupted, relief operations can be operated through water transport. (Olson, 2015)

2.4.2 Disadvantages of Water Transport

(a) Slow Speed - It is a slow means of transport. Failure of monsoon results into fall in the water level of rivers making navigation difficult.

(b) More Risky - Water transport is more risky as compared to other means because there is always danger of sinking ships or boats.(Olson, 2015**)**

2.5 Inland Water Transportation in South East Asian Nations

Asia is naturally endowed with navigable rivers, lakes and canals. Some of them, such as the Ayeyarwady, Ganges, Jamuna-Brahmaputra, Lanoang-Mekong, Volga and Yangtze rivers are world famous for the enormous contribution they have made to national and regional development. Others, including the Pearl River in China, the Mandovi and Zuari Rivers in India; the Thanlwin River in Myanmar, the Fly River in Papua New Guinea, the Chao Phraya River in Thailand and the Red River in Viet Nam, are less famous but equally important for their contribution to national economies and people's daily lives.

The total navigable length of rivers, lakes and canals in the ESCAP region exceeds 280,000 km. On these inland waterways, more than 1 billion tons of cargo and 500 million passengers are moved each year. The regional inland waterway transport (IWT) fleet consists of more than 446,000 vessels, with a combined carrying capacity of 27.5 million tons. The region's inland waterways play a vital role in the economic development of remote rural areas and in the welfare of their inhabitants, who are usually among the lowest of low-income groups in the region.

Unlike in Europe, IWTS in most South East Asian countries planned, developed, operated and maintained independently by respective countries. Ironically, in this region, almost every member country possesses a handful of inland waterway networks system which makes them economically in the past and at present. China, being the country with the longest waterway network system in the world, with the next top ten of the ranking belong to Asian countries of Indonesia in fourth, Vietnam in fifth and Myanmar in tenth. (Kader, Saman , Ahmad, 2017)

2.5.1 Inland water transportation in Malaysia

The roles of rivers in Malaysia that providing transport for various undertakings, still continue until today. In many part of Malaysia especially in the rural area of Sarawak, Sabah and Pahang, IWTS is still be significantly used as a transport system. IWTS has and will always play the roles for the social, economic and strategic requirements. In Sarawak where inland IWTS is mostly thrived in Malaysia, the river transport system has a great significance to a large section of the population living in the interior and along the coast. This system is an important means of transportation to passengers and goods which is large proportions of the population of the State. Sarawak has a total of 55 navigable rivers with a combined length of 3,300 km. Of all the rivers in Sarawak, the Rajang is the most important with a total length of 773 km long and navigable up to 567 km. It is the longest river in Malaysia. Between 300 and 500 boats and vessels ply the river on daily basis.

2.5.2 Indochina's Mekong River Transportation

The Mekong River (known in Tibet as Dza-chu, China as Lancang Jiangand Thailand as ae Nam Khong), is a major river in south-eastern Asia (SEA). It is the longest river in the region. From its source in China's Qinghai Province near the border with Tibet, the Mekong flows generally southeast to the South China Sea, a distance of 4,200 km (2,610 mi). The Mekong crosses Yunnan Province, China, and forms the border between Myanmar and Laos and most of the border between Laos and Thailand. It then flows across Cambodia and southern Vietnam into a rich delta before emptying into the South China Sea. In the upper course are steep descents and swift rapids, but the river is navigable south of Louangphrabang in Laos.

2.5.3 Inland water transportation in Thailand

In Thailand for instant, about 4,000 kilometres of inland waterways consisting of the rivers and canals of the central plain and the Chao Phraya Delta formed the backbone of the transportation system. Although in the twentieth century railroads and roads assumed a dominant position in the central plain, waterways still carried a sizable portion of the total traffic. Waterborne freight, chiefly consisting of rice, accounted for about 17 percent of total freight transported countrywide in the 1980s. Large numbers of small craft also transported passengers. During the rainy season about 1,600 kilometres of waterways were navigable by barges of up to 80 tons and

1.8-meter draft, which could travel from the Gulf of Thailand to as far north as Uttaradit Navigation was reduced to about 1,100 kilometres of waterways in the dry season, and traffic could navigate only to Nakhon Sawan, roughly halfway to Uttaradit. Shallow-draft vessels could navigate the interconnected network of canals throughout the year, and Bangkok, Ayutthaya, and other towns had floating markets where a great deal of trading activity took place. Some sections of the Mekong River were also navigable.

2.5.4 Inland Water Transportation in Indonesia

In Indonesia, with almost 245 million populations and a very large geographical area, rivers big and small have always been vital for social and economic development. In Sumatera, Java, Sulawesi, Irian Jaya and Kalimantan alike, there is still some significant river system thriving until at present for these activities. One of them, Mahakam River still plays important transportation roles for the economic and social well-being of the people. It is located in the east of Kalimantan most popular with major activities of the river tourism movement specially in exploring the tribal culture. The east Kalimantan is nowadays known as the most industrially advanced province of Kalimantan. Its population is less than two million, and the density figure of seven people per kilometre is among the lowest of Indonesia, although relatively high for Kalimantan. More than 80 percent of the area or over 17 million hectares is covered by forest.

2.5.5 Inland Water Transportation in Cambodia

The inland waterway system of Cambodia has a total navigable length of 1,750 km, of which only 580 km are navigable all year round. The system consists of the Mekong River and its tributaries, the Tonle Sap Lake and its tributaries, the Tonle Sap River, and the Bassac River. The Mekong River accounts for about 30 per cent of the length of navigable inland waterways, Tonle Sap 15 per cent, Bassac River 5 per cent and the remaining waterways 50 per cent. As there are no navigation lights along the Mekong River in Cambodia, passage is possible only during the day, using channel markers or buoys for navigation. At low-water levels, the presence of rocks between Kratie and Stung Treng (128 km by river from Phnom Penh) restricts passage to small vessels of up to 20 tons. The remaining navigable waterways are restricted to vessels of up to 100- to 150-ton capacity.

2.5.6 Inland Water Transportation in Lao People's Democratic Republic

The total length of the inland waterways of the Lao People's Democratic Republic is 4,600 km. The primary component of this system is the Mekong River, with 1,970 km or 40 per cent of its total length within the territory of the Lao People's Democratic Republic. The Mekong River in fact defines much of the border with Thailand and Myanmar. Some 1,865 km of its total length in the Lao People's Democratic Republic is navigable. There are difficulties on some sections, particularly in the Upper Mekong, owing to the presence of sand bars, shallow depths, sharp bends, narrow channels, rocky outcrops and rapids. The volume of cargo moved by IWT in the Lao People's Democratic Republic in 1998/99 was 573,000 tons, or 35 per cent of the national cargo volume, and the IWT cargo transport task in that year was 22.015 million ton-km, or 16 per cent of the national cargo transport task. The shares of IWT in both the national cargo volume and transport task have been diminishing at a slow rate over the past 3 to 4 years.

2.5.7 Inland Water Transportation in Viet Nam

Of a total length of about 45,000 km of rivers, canals and coastal line lakes throughout Viet Nam, navigation is possible on about 9,500 km. Approximately 6,300 km of navigable waterways are under the control of the Viet Nam Inland Waterway Administration and the balance (3,200 km) is under the control of the provincial administrations. Roughly 63 per cent (6,000 km) of the country's total length of navigable inland waterways is concentrated in the rivers and canals of the Mekong Delta. On the waterways controlled by the Administration, about 10,500 fixed aids for navigation (basically signs to aid safe navigation) have been installed. Some major channels handle dense volumes of traffic, in terms of deadweight tons (dwt) per year. For example, in the south, the Cho Gao/Hau Giang and the Tien Giang River systems handle 21.6 and 15.8 million dwt per year respectively, while in the north the Kinh Thay river system handles 15.2 million dwt per year.(Kader, Saman , Ahmad, 2017)

2.6 Reviews on Previous Studies

Khin Zaw Win (2011) studied a thesis, "A Study on The Inland Water Transportation of IWT in Delta Region", which analyzed the performance of inland water transportation of Delta region in Myanmar by comparing that people used the waterway transportation services provided by IWT than other modes of transport

although transport by waterway is slow. In this, the political changes in Myanmar together with the development of economy will definitely be accompanied by the increase in transportation of passengers and cargoes had been mentioned.

Theint Theint Aung (2013) analyzed in public transport service, Ma-Hta-Tha on the thesis title of "A Study on Customer Satisfaction of Ma-Hta-Tha Public Transport Service (Case Study: No.48 Special Bus Line)". This thesis examined the customers' satisfaction in operation and service of the bus line by undertaking the survey with the commuters using the bus line. According to the result, customers' satisfaction is below the average level of satisfaction due to poor service, reckless manners of drivers, uncertain schedules and unsafe experiences faced by commuters which are necessary to control for the public transport.

Zwe Zaw Zaw (2015) analysed a thesis, "A Study of Customers' Satisfaction on Express Mail Services Provided by MPT". The study emphasized on exploring how the service is struggling for its survival threatened and determines the customer's satisfaction on service provided by MPT based on empirical data. In this study, it revealed that the perception of respondents on EMS for all dimensions which were lower than they expected.

CHAPTER III
INLAND WATER TRANSPORT IN MYANMAR

3.1 Inland Water Transport of Myanmar

Among the various modes of transportations, Inland Water Transport is a mode of transport that has special advantages. Bulk cargoes barges and boats have the advantages of large capacity for transportation. Being high productivity and low fuel consumption, the physical size and weight of large and heavy cargo units are transported by waterways efficiently.Most of races are home to the basins of respective river systems.Fare of IWT is cheaper than other modes of transport. Cargo transport operating cost figures reveal that IWT is about five times cheaper than road transport and about two times less so than rail transport. Inland Water Transport is the only means of transportation and communication in some parts of the country.Therefore, IWT is very essential not only for the economic development of the country but also for the welfare of the people living in isolated communications and remote areas. IWT has been the most important means of transport.

The original organization of Inland Water Transport is Irrawaddy Flotilla Company Limited which was established in 1865 as a private company. Irrawaddy Flotilla Company Limited was nationalized on 1st June 1948 and named as Inland Water Transport Board after gaining the independence of Myanmar. It was named Inland Water Transport Corporation on 1st March 1972 and it had been changed to the present name of Inland Water Transport on 1st April 1989.

The history of Inland Water Transport related with history of Myanmar and remarkable events of Myanmar. As Inland Water Transport is an important transport organization in Myanmar, history of IWT is also important. (Department of Inland Water Transport, 2004)

3.2 Private sector under Irrawaddy Flotilla Co. Ltd; from 1865 to 1948

After second war of English- Myanmar, British declared that Bagoand Mottama were captured by British on December 1852. British government carried 3

powered vessels, namely Damoodah, Lord Willian, Nerbudda and 3 non-powered vessels from Calcutta to Yangon for military purpose in second war of English and Myanmar. These vessels were used as passenger carriers and also for postal services after war. At that time, water transportation was provided by Todd and Finle Companyon behalf of British government. Yadanapone shipyard was established in 1864 and vessels and services were handed over to private by British government. Irrawaddy Flotilla Company Limited and Burmese Steam Navigation Company Limited were established as private inland water transport with contract system and first trip was Yangon- Thayet route.

At the same time, King Mindone purchased four steamers and ran between upper Burma and lower Burma. In 1868, more appropriate vessels such as Colonel Phayre and Colonel Fytch were used to extend the route from Mandalay to Bahmaw.

Yangon- Mandalay and Delta routes were started in 1869. British government granted long term permission to Irrawaddy Flotilla Company to sail all routes over inland waterways. Dalla dockyard was also granted with long term agreement. Steel Brothers Company established the dockyard on Strand Road in Mawlamyine in 1882.

In 1885, after the English-Myanmar third war, Irrawaddy Flotilla Company built the vessels itself to use for their company. It also got more chance from British government. Irrawaddy Flotilla Company extended river transport along the Thanlwin River. U Nar Ouat, the rich man whose race is Mon, purchased (7) numbers of double deck vessels,(2) numbers of single deck vessels and competitively ran with Irrawaddy Flotilla Company but he could not compete. Finally he had to sold those (9) vessels to his competitor, Irrawaddy Flotilla Company Limited.

Before the Second World War, Irrawaddy Flotilla Company was the only major transportation service provider in the Ayeyarwaddy, Chindwin, Thanlwin Rivers and Delta regions. At that time, Company had over 650 power and non-power vessels and transported over 8 million passengers and 1.5 million ton cargoes annually. During the Second World War, vessels were destroyed and sunk by British to avoid letting them to Japan. After the Second World War, Inland Water Transport Order 1945 was announced in accordance with Simala Program and water transportation was continued with vessels which were transferred by military. After Myanmar independence, Irrawaddy Flotilla Company was nationalized on June 1st 1948. At that time, there were 229 power vessels and 385 non-power vessels, a total of 614 vessels.

During the colonial period, Irrawaddy Flotilla Company was the only major transportation service provider in Myanmar. It was a private and profit oriented company at that time. Forerunner of company was organized to provide conveyance services for His Majesty's troops, stocks and mails to station of British-Burma on the Irrawaddy River. The company made contracts for services with the Government of India and extended the services for the routes in the whole of country. All vessels and dockyards were granted with long term contract system. The numbers of fleet increased year after year.

The Irrawaddy Flotilla Company had monopoly power in Inland Water Transport at the colonial period. The company was a foreign enterprise having its main office in Scotland and all shareholders were foreigners. So all profits which were made in Myanmar were through the operations of the inland water transport were sent to abroad. All competitors could not make competition the major business firm of Irrawaddy Flotilla Company which was supported by British Government. At such a situation, the company would have maximized profits by taking all the advantages of its supreme position. The exact amount of profits earning were unknown to people during that period. It must be huge and could be considered as losses of resources of country, surplus value of capitalism and features of colonialism. (Department of Inland Water Transport, 2004)

3.3 Public Sector under Government Services Since 1948

After nationalization at June 1st 1948, reorganizing as Inland Water Transport Board and all of departments included Rakhine section, Irrawaddy section and Port Lighter age section were managed by Chairman of Board. As of running the inland water transport, (8) departments were included under Irrawaddy Section. These were Traffic Department, Launch Department, Personal Department, Cargo barges and general Department, Dockyards Department, Marine Department, Engineering Department and Account Department. Between 1948 and 1949, the numbers of (31) 'S' type vessels from England enforced the strength of inland water transport of Burma. Port Lighter age Section was transferred to Irrawaddy Section. Inland water transportation in Rakhine State was taken by Inland water Transport Board on May 1st 1950 and operations were done by Barge and Port Lighter age Section.

U Lun Baw was commissioned as chairman on March 20th 1950 to improve the transport services and to enquire appropriate factors of reform and that enquiring

commission reported with 47 advices to government on April 30th 1951. Then port lighter ages were transferred to Irrawaddy Section which to be attached with Cargo barge and General Department. In 1952, the Union of Burma Inland Water Transport Board Act was enacted and according to that Act separated into eight departments to operate the inland water transport services.

On October 1st 1953, Araekan Flotilla Company was nationalized and handed over to Union Shipping Board. According to 1952 Act, that service was reorganized with a chairman and (10) members. General Manager took responsibility as secretary of board. Inland Water Transport Board is strengthened with (174) vessels between June 1st 1948 to1960. In 1953, there were 5 low water and back wheel double decked vessels , 50 "T" class double decked vessels in 1955-56, 6 numbers of tug boat named "Sin Pyaung" in 1956 and 30 other tug boats, back wheel double decked (medium) 5 vessels and (small) 3 vessels in 1957, 3 vessels of "B" class double decked in 1957 ,10 fish type vessels in 1958, 30 numbers of cargo barges (120 Tons) JR , 30 numbers of cargo barges (800 Tons) and 2 cargo barge in 1960. (Department of Inland Water Transport, 2004)

Table 3.1 Vessels Strength between 1948 and 1960

Sr.No.	Particular	Year	Number
1	Low water, back wheel double decked	1953	5
2	"T" class double decked	1955-56	50
3	Sin Pyaung tug boat	1956	6
4	Tug	1956	30
5	Back wheel double decked (medium)	1956	5
6	Back wheel double decked (small)	1957	3
7	"B" class double decked	1957	3
8	Fish type vessels	1958	10
9	Cargo barge (120 Tons) JR	1958	30
10	Cargo barge (800 Tons)	1957-58	30
11	Cargo barge	1960	2
Total			**174**

Source: MOTC, IWT

At the Revolution Council initially reigned on 2nd March 1962 and the organization purchased new vessels and built new cargo barges. Nyaungdan-Thanlyin ferry, Pansodan-Dalla ferry and Yangon-Khanaungto ferry were started running in 1963. In 1964-65 fiscal years, 9.76 million of passengers and 1.61 million ton of freights were transported by Inland Water Transport. According to data in 1969, vessels strength were 316 power vessels, 309 non-powered vessels and 102 station pontoons, totally 727 vessels were run by Inland Water Transport.

Inland Water Transport Board was changed the name as Inland Water Transport Corporation by new governance system and head of department was changed to call Managing Director. Vessels strength was (464) power vessels, (404) non-power vessels, totally (868) vessels at that time.

In 1975, "Ba" type cargo barges installed engine with loan of World Bank and 37 power vessels and 107 non-power vessels were transferred to Myanmar Petrochemical and Gas enterprise.

Expanding of vessels strength with Overseas Economic Corporation Fund's loan included "Sa-Kha" type 13 vessels and "Ba-Kha" type 26 vessels on 8th June 1979, replacement of old engines with Kelvin loan included 99 numbers of Kelvin engine on 26th March 1980 and 72 numbers of Dorman engine on 9th August 1983 fulfilled by Inland Water Transport Corporation. To improve the efficiency of freight forwarding vessels and barges, new passenger-cargo vessels were built and renovated with foreign loans.

Before the reign of State Law and Order Restoration council, strength of vessels was 353 power vessels, 269 non-power vessels and 37 station pontoons. Inland Water Transport Board had been changed to the present name of Inland Water Transport on 1st April 1989.

In 1993, new powered-barges and cargo barges were built and some were purchased from People Republic of China, Yunan Machinery Corporation (YMC) Loan. Those 14 vessels were built in China and 28 vessels were built in Myanmar between 1994 and 1996 .The amount of first stage loan was USD 30 million. As second stage, 23 vessels were built in China and 7 vessels were built in Myanmar between 1995 and 2000. With the amount of USD 40 million loans, total of 72 vessels were purchased. Bazaar vessels running along the Ayeyarwaddy River was started on 21st January 1993. According to Institutional order of State Peace and Development Council 36/98, Effective and Efficiency Controlled Committee for Myanmar

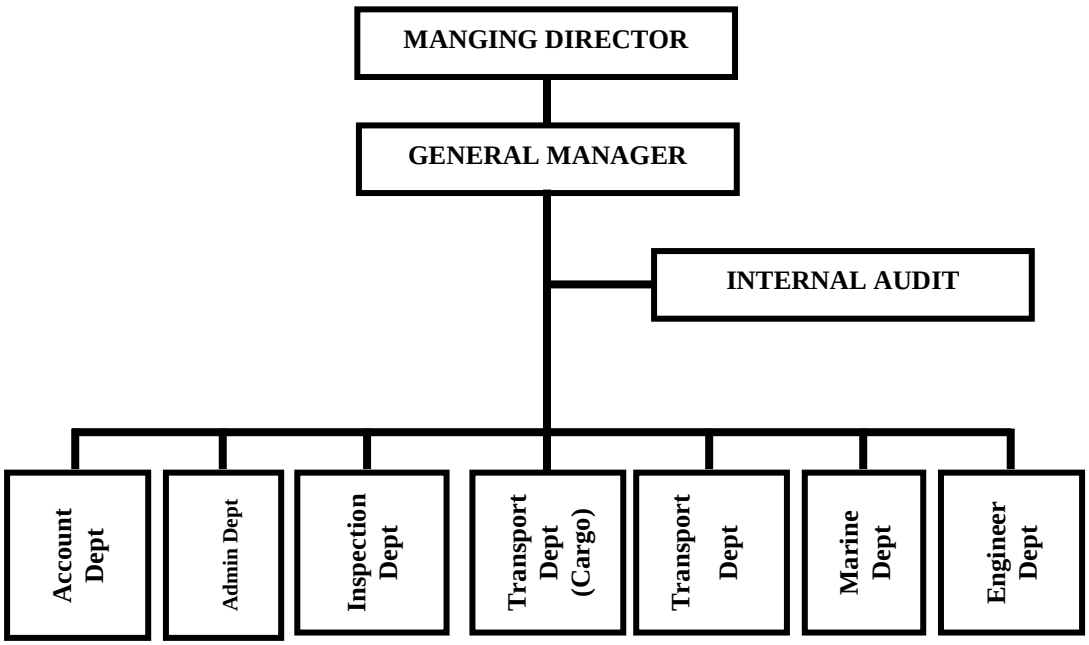
Railways and Inland Water Transport Services was formed on June 1st 1998. (Department of Inland Water Transport, 2004)

3.4 Organization of Inland Water Transport at Present

Inland Water Transport is one of the state owned enterprises under the Ministry Of Transport and Communications in Myanmar. It is also an organization of service provider with vessels and barges. Passenger and freight transport, freight forwarding and ferry routes are provided by Inland Water Transport along total service mile 9219 miles in Myanmar's rivers. In order to be able to perform the tasks of water transportation effectively, it has organized with seven departments under the management of the Managing Director. The seven departments of IWT are Administration Department, Transport Department, Transport (Cargo) Department, Engineering Department, Marine Department, Account Department and Inspection Department. (Department of Inland Water Transport, 2010)

The IWT carries out day to day operations by utilizing its minimum manpower and the data describes the comparative statement of sanctioned strength of 273 officers and 10666 staffs and appointed personnel strength of 143 officers and 2171 staffs as at February 27th 2019. The Organization Chart of IWT is shown as follows:

Figure (3.1) Organization Structure of IWT



Source: MOTC, IWT

3.5 Functions and Responsibilities of IWT

The principle functions of IWT are to carry out the transportation of passengers and freight along the navigable waterways of Ayeyarwaddy River, Chindwin River, and also in Delta area Rakhine, Mon and Kayin States and to operate ferry services for convenience of passengers and vehicles.

IWT plays a vital role in providing safe and convenient transportation of passengers and cargoes around the country. To smooth and convenient flow of goods and services, IWT utilizes its facilities to optimize transport performance whilst meeting public requirements. Inland Water Transport has provided the public services accordance with the motto; "Safety, Service and Image".

The responsibilities of IWT as one of the public sectors of the country are;

(a) To perform water transport services in the state and to perform other related vessel services by this laws.

(b) To perform security and safety of passengers, cargo, vessels and crew in providing water transport services and not to make the environment polluted in accordance with the existing law.

(c) To perform passenger and cargo transportation along the coast and rivers stipulate by the ministry.

(d) To procure and stare the raw materials, machineries and fuel needed for dockyards, construction and repairing of vessels.

(e) To accept repairing construction and selling of new vessels owned by Government Department and Organizations, local foreign private organizations and other services.

(f) To perform the tasks occasionally offered by the national security and interest.

(g) To control the state properties and finances not to be wasted lost, damaged and stolen.

(h) To perform any matters needed to increase the revenues and profit by the agreement of the Government and the Ministry.

(i) To collect the money due by IWT accordance with the existing law and injecting to the state Fund.

(j) To manage monetary affairs in accordance with financial rules and regulations.

In 2019, there are 258 vessels and barges in IWT, consisting of 151 powered craft, 76 dumb barges and 31 station pontoons. Most of fleet in IWT are old and obsolete. It needs to invest new and modern ships. For cargo transport, it also needs to introduce containerization, to make suitable inland port facilities for loading and unloading. IWT has insufficient budget to invest for construction of vessels or ships and for upgrading the facilities. So, there is a plan to cooperate with some partner for J.V. Among the total numbers of vessels and barges, 44.2 % of them are over 61years old, 10.8 % are between 40 to 60 years old, 34.1 % are between 20 to 40 years old, 3.5 % are between 10 to 20 years old and 7.4 % are under 10 years old respectively. (Department of Inland Water Transport, 2010)

Table 3.2 Fleet Composition of IWT at present

Sr. No.	Type of Vessels	Numbers of Vessels
1	Passenger Cum Cargo	88
2	Cargo	31
3	Powered Barge	11
4	Water Tender	1
5	Tug	15
6	Oil Tanker	1
7	Miscellaneous	4
8	Cargo Barge	69
9	Oil Barge	7
10	Station Pontoons	31
	Total	258

Source: MOTC, IWT

There are six operation divisions under the transport department; namely Delta, Ayeyarwady, Chindwin, Thanlwin, Rakhine and Cargo division to carry out smooth and secure transportation of passenger and cargo by IWT's fleet. The Inland Water Transport has 235 Calling Stations at the revering towns, villages and Delta Area. There are 235 calling stations ; comprising of 114 calling stations are in Delta Region, 57 are in Ayeyarwaddy Region, 16 are in Chindwin Region, 28 are in Thanlwin Region and 20 are in Rakhine Region.There are 51 service ruotes in 2010-2011 Fiscal Year, 18 service routes in 2016-2017 Fiscal Year, 19 service routes in 2017-2018 Fiscal Year and 22 service routes in 2018-2019 Fiscal Year. The new

roads and bridges are now constructed and transport network were developed through the whole country. So that some inland water way transport routes closed and some trip are reduced. IWT which is a low-cost , energy efficient and eviromantally friendly mode of transport . So, IWT is more cheaper than other modes such as rail, road, Air transport.

But IWT mode has some difficulties and obstacles. This mode have faced more steps than other modes and more expense in handling charges. The vessels of IWT are low speed because they are old vessels assembling old engines. Having old dockyards and facilities, the implementation for construction of new vessels and repairing of vessels and barges is insufficient. As it also needs annual dreadging shallow depth of navigable waterways, the expenditure will be used . If there are insufficient navigational marks on ashore & afloat, it will be unsafe in travelling . If there is high cost of fuel , it will be uneconomically .Having bridges across the river all over the country, it will decrease the demand of passengers and flow of cargo in inland water transportation.IWT is endeavoring to support the improvement of transport sector in Myanmar and has been achieved the annual plans lay down by the Ministry of Transport and Communications. The performances of annual plans are shown in the following statistics.

Table 3.3 The performace of passengers and cargoes transportation in million

Fiscal Year	Passenger	Passenger*Mile	Ton	Ton*Mile
2000-2001	23.27	457.23	3.86	344.38
2010-2011	27.56	920.21	4.79	753.69
2011-2012	19.30	531.27	3.35	519.88
2012-2013	15.02	210.10	2.12	332.00
2013-2014	13.24	146.12	1.90	283.12
2014-2015	12.29	96.65	1.79	282.35
2015-2016	11.24	54.54	1.38	187.81
2016-2017	10.32	44.86	0.95	100.19
2017-2018	10.02	41.09	0.67	63.71
2018-2019	3.51	13.25	0.32	22.34

Source: MOTC, IWT

At 2010-2011 fiscal years, the amount of passengers and passengers per mile are the highest and also the amount of cargo and cargo per mile are highest. Therefore, during 10 years, it gets best performance of inland water transportation. At 2018-2019 fiscal years, the amount of passengers and passengers per mile are the lowest and also the amount of cargo and cargo per mile are lowest. According to the data of IWT, at 2018-2019 fiscal years, inland water transportation can face great loss in Statement of Financial Position of IWT. In general, loss is increasing year by year within 10 years.

3.5.1 Dockyards of IWT

To promote efficiency and to have sustainable transportation system, effective maintenance of vessels and new construction of vessels are also important in Inland Water Transport. It also needs new buildings and upgrading the dockyards. According to Mandalay-Yadanarpone dockyard project, new dockyard, length 600 feet, breadth 180 feet, capacity 300 ton was established in 1998-99 Fiscal Year. It was opened on 18th February 2004. Upgrading the Dalla dockyard construction had been done from 274 tons slipway to 1400 tons slipway completed on 19th April 2001. In 2000-2001 fiscal years, old Ahlone shipyard slipway number 1, 2, 3 and 4 were renovated. There are six dockyards and could be provided annual docks, major repairs, minor repairs, and new vessels building. Furthermore concrete jetty which is 100 feet length and 20 feet breadth was established at the 14th slipway in 2003-2004 budget years.

At present, in Myanmar, there are altogether six dockyards under the Engineering Department of IWT, namely Dalla dockyard and Dagon Seikkan dockyard in Yangon Region, Yadanarpone dockyard in Mandalay Region, Thanlwin dockyard in Mon State, Sittwe dockyard in Rakhine State and Chindwin dockyard in Sagaing Region.

3.5.2 Dalla Dockyard

Dalla dockyard was built on 30 acres and established by British Government since 1852 and situated in Yangon**.** It has 14 numbers of slipway, 22 vessels docking capacity, and 1400 tons of maximum death weight ton for docking. Dalla dockyard takes responsibility for vessels based in Yangon. Dalla dockyard is one to repair those of the over 300 ton vessels. It not only repairs defective vessels but also builds new vessels for requirement of enterprise.

3.5.3 Dagon Seikkan Dockyard

Dagon Seikkan dockyard was built on 44.6 acres land area at Dagon Seikkan Township, Yangon Region in 2012. It is the biggest under IWT and it was built to replace in Ahlone dockyard for handing - over from IWT to MIP, one of the Private Company, by the Government's Master Plan. Before Dagon Seikkan dockyard, Ahlone dockyard had 6 numbers of slipways, 16 vessels docking capacity and 250 tons of maximum DWT for docking. Most vessels under Delta Division docked at Ahlone dockyard, while the rest were docked at Dalla dockyard. It was a key place to store important and expensive materials needed for dockyard. In 2012, the new dockyard was named Dagon Seikkan dockyard as it is situated in Dagon Seikkan Township. It has eight slipways, 26 vessels docking capacity and 1400 tons of maximum death weight ton for docking. It helps ensure smooth transportation of the vessels in Yangon Region.

3.5.4 Yadanarpone Dockyard

Yadanarpone dockyard was built on 8.94 acres land area at Mandalay Region which was named as Yadanarpone dockyard in 1853 and transferred to Irrawaddy Flotilla Company in 1885. It has one slipway, 5 vessels docking capacity and 300 tons of maximum death weight ton for docking. It helps ensure smooth transportation of the vessels in upper Ayeyarwaddy River.

3.5.5 Mawlamyine/ Thanlwin Dockyard

Thanlwin dockyard was built in 1914 and its area is nearly 23 acres. It has 1 slipway, 2 vessels docking capacity and 300tons of maximum DWT for docking. This dockyard repairs vessels for overall defect with the rest for major and minor repair. This dockyard also preserves a long history since 1882 that Steel Brothers Company Limited established a small yard to repair their vessels plying along the Thanlwin River.

3.5.6 Sittwe Dockyard

Sittwe dockyard was built by Arakan Flotilla Company and its area is 3.37 acres wide. It was transferred from under Arakan Flotilla Company to IWT. This dockyard has three slipways and it is able to dock 5 vessels at a time and up to 250 tons vessels can be docked. It provides repair service for vessels of Rakhine Division.

3.5.7 Chindwin Dockyard

Chindwin dockyard building was started in 2000 and opened on 7th August 2005. The opening of this dockyard is one of the major achievements of IWT with reduce cost to send the vessels for docking from Monywa to Yangon. It provides docking service to 30 vessels of Chindwin Division.

Table 3.4 Dockyards under I.W.T

Sr. No.	Dockyards	Location (Region/State)	No. of Slipway	Docking Capacity (Vessels)	Maximum DWT for Docking (Tons)
1	Dala	Yangon	14	22	1400
2	Dagon Seikkan	Yangon	8	26	1400
3	Yadanarpone	Mandalay	1	5	300
4	Thanlwin	Mawlamyine	1	2	300
5	Sittwe	Rakhine	3	5	250
6	Chindwin	Sagaing	2	3	250
Total			**29**	**63**	**3900**

Source: MOTC, IWT

3.6 Three Ferry Routes in Yangon Region

Among three ferry routes of IWT, Pansodan-Dalla ferry route is the highest demand for Delta division in Yangon region. In Pansodan-Dalla ferry route, three ships, namely Cherry-1/2/3 are used Pansodan quayside and Dalla quayside to and fro daily for transportation of passengers and luggage of cargo. In Wahdan-Dalla ferry route, Ro Ro-IV, which is running Wahdan quayside and Dalla quayside to and fro daily, is used to transport passengers and motor cars and vehicles. In Yangon-Khanaungto route, Ba-La type and "T" class vessels are running for transportation of passengers and cargo daily from Yangon quayside and Khanaungto quayside. The particulars of ferry ships, pictures of ferry ships and income from transportation of passengers and cargo in each route are described with appendices.

Ferry routes are long year service transportation of IWT. Captains, crews and skill staffs are assigned for ferry transportation service to provide with the responsibilities to manage and monitor the vessels and passengers to be safe, not to delay for the passengers, to manage the passengers and cargoes to be place systematically, to get the good performance in daily routine of the service efficiently.

In Pansodan-Dalla route, the ticket price for each passenger is one hundred kyats for one cycle. In Yangon-Khanaungto route, the ticket price for each passenger is two hundred kyats and price for a medium size luggage is seven hundred kyats and the small is two hundred kyats. The price for motorcars and vehicles in Wahdan-Dalla routes is in the range of 100 kyats to 6000 kyats.

CHAPTER IV
SURVEY ANALYSIS

4.1 Survey Profile

The inland waterways transportation in Myanmar is better than other modes of transport in long term. Inland Water Transport has been considered as cost effective, relative fuel efficient, environment friendly and more employment generating mode of transport. In Myanmar, Inland Water Transport Department (IWT) is organized into seven main departments and six divisions. Transportation of IWT is operated by six divisions; namely Delta, Cargo, Ayeyarwaddy, Chindwin, Thanlwin and Rakhine, for passengers and cargo transportation with short routes, long routes and ferry services. The river transportation service is also known as the ferry service that is important for the welfare of public in passing through the river for their travel daily. Among the six divisions of operations, there are three routes of ferry transportation operated by Delta division of IWT in Yangon Region. These routes are Pansodan - Dalla, Yangon-Khanaungto and Wahdan - Dalla routes.

4.2 Survey Design

The study focused on the customer's perception of ferry transportation provided by Inland Water Transport Department (IWT) in Yangon Region, Myanmar**.** Primary data was collected from a sample group of 350 respondents relating with the ferry transportation system of IWT in which there is three routes provided by IWT in Yangon Region. The survey questionnaires were formed based on secondary data from Inland Water Transport Department, Ministry of Transport and Communications. Time frame for the secondary data from Inland Water Transport Department (IWT) is coverage from 2007- 2008 fiscal years to 2017-2018 fiscal years.

The respondents were interviewed with a questionnaire to attain the intended information. Those respondents are daily passengers who travelled in return by ferry from Dalla side to Yangon side. The respondents live in Dalla Township are 144 and

that amount is the largest among respondents and the smallest is from other Areas. Among them, 66 respondents are living in Yangon area and 27 respondents are various townships.

No	Types of Respondents	Number of Respondents
1	Passengers from Dalla	144
2	Passengers from Seikkyi/Khanaungto	36
3	Passengers from Twantay	35
4	Passengers from Kun GyanKone	42
5	Passengers from Yangon	66
6	Others	27

Source: Survey Data, 2019

Random sampling method was used in this study. These are two main groups of data collection; (a) daily ferry passengers, and (b) the departmental officers. For the data collection, the survey questionnaires and the Key Informant Interview were used. For the respondents, focus group discussion (FGD) approaches are used and KII (Key Informant Interview) method was used for Inland Water Transport Department (IWT) in Yangon Region.

4.3 Survey Results

Questionnaires are set up into five sections; (1) The Demographic Questionnaire for the Residents, (2) Knowledge, Attitude and Practice (KAP survey) on Ferry Transportation System of IWT by Respondents,(3) Behaviour of Respondents in Ferry Transportation System of IWT (4) Awareness of Respondents in Ferry Transportation System of IWT, (5) Perception of Respondents on Ferry Transportation System of IWT.

4.3.1 Demographic Characteristics of Respondents

Table 4.1 shows the demographic characteristics of respondents from survey area and those respondents travel daily by ferry under the control and monitoring of ferry transportation of IWT. There are nearly 40,000 passengers at Pansodan- Dalla ferry route daily. Nearly 400 passengers were interviewed and 350 respondents responded completely.

Table 4.1 Demographic Characteristics of Respondents

No	Variables	Characteristics	No. of Respondents	%
1	Home Town	Dalla	144	41
		Seikkyi/Khanaungto	36	10
		Twantay	35	10
		Kun GyanKone	42	12
		Yangon	66	19
		Others	27	8
		Total	**350**	**100**
2	Age	Under 18 years old	36	10
		Between 18 and 30 years old	85	24
		Between 31 and 45 years old	138	39
		Between 46 and 60 years old	76	22
		Above 61 years old	15	4
		Total	**350**	**100**
3	Marital Status	Single	96	27
		Married	211	60
		Others	43	12
		Total	**350**	**100**
4	Gender	Male	235	67
		Female	115	33
		Total	**350**	**100**
5	Occupation	Government Employee (Staff/ Officer)	64	18
		Business Employee	82	23
		Business Owner	34	10
		Student	52	15
		Others (Worker, Labour, Vendor, Retiree, Dependent, etc.)	118	34
		Total	**350**	**100**
6	Education Level	Basic Education Primary and Middle School	162	46
		Basic Education High School	64	18
		University / Diploma	55	16
		Degree Holder	48	14
		Master Degree and above	21	6
		Total	**350**	**100**
7	Income per month of respondent	Under 150000 MMKs	94	27
		Between150000 & 400000 MMKs	141	40
		Above 400000 MMKs	69	20
		No income	46	13
		Total	**350**	**100**
8	Number of Family Members	Under 3 members	49	14
		Between 3 and 5 members	148	42
		Above 6 members	153	44
		Total	**350**	**100**

Source: Survey Data, 2019

The respondents travel daily and among them, the largest group of age is 39% who are between 31 years and 45 years. That group age is the active adults. The least group is 4% elder of age above 61 years and they are age for pensioners.

In studying the marital status, the most group is the married group and the others are12%. Among the respondents, the men are on the most group. It is apparent that the family economy is mainly dependent on the men.

About the occupation, the business owners are the smallest group among the respondents and the day-workers and hard-workers are the largest group. The government should emphasize the most of people who travel by ferry from one side to other side of Yangon. Most of the respondent is survival for daily income for families. The ferry is main factor for travelling.

The most of them are low level education and is under the basic education of primary and middle schools. The least is master degree level and above it. The basic people are mainly dependent on the ferry. If the ferry fee is extremely high, or the ferry travelling is suddenly stopped, a lot of problems can be occurred.

The group of respondents, who get income per month between150000 & 40000MMKS, is the largest. The no-income group is the smallest and the student age of respondents can be seen in travelling by ferry.

The smallest group is the smallest number of family members less than 3. The largest group is greater than 6 family members.

The discussion can be briefly presented that the lowest level of education, the lowest level income-group, the basic level of occupation and the biggest family-members group are dependent on the ferry.

4.3.2 Knowledge on Ferry Transportation System of IWT by Respondent

The respondents of basic workers and employees are mainly dependent on ferry in travelling from one side to side in Yangon. To survey impact on ferry system, the respondents' knowledge is studied.

Table 4.2 Knowledge on Ferry Transportation System of IWT by Respondents

No	Variables	5	4	3	2	1	Mean
1	Know the daily schedule of ferry-boat	34 (9.71%)	72 (20.57%)	178 (50.9%)	40 (11.4%)	26 (7.4%)	3.13
2	Know the insurance programme for using ferry	4 (1.14%)	11 (3.14%)	18 (5.14%)	60 (17.1%)	257 (73%)	1.4
3	Understand the safety programme	22 (6.29%)	48 (13.71%)	116 (33.1%)	153 (43.7%)	11 (3.1%)	2.76
4	Recognize the regulations prescribed about ferry transportation system	12 (3.43%)	34 (9.71%)	57 (16.3%)	97 (27.7%)	150 (43%)	2
5	Be acquainted with the daily moving boats	54 (15.4%)	82 (23.43%)	166 (47.4%)	31 (8.86%)	17 (4.9%)	3.36
6	Perceive the officer or staff or crew from ferry transportation system	28 (8.00%)	29 (8.29%)	63 (18.0%)	130 (37.1%)	100 (29%)	2.3
7	Hear the warning of not-to-do things while travelling by ferry-boat	68 (19.4%)	111 (31.71%)	138 (39.4%)	28 (8.00%)	5 (1.4%)	3.6
Overall mean score							2.65

Source: Survey Data, 2019

Key Note

(1) Don't Know 0%, (2) A little 25% (3) Know 50%

(4) Well Know 75% (5) Very well Know 100%

Table 4.3 Interpretation of Mean Score

Mean Score	The Level of Agreement
0.00 – 1.5	Very Low
1.51 – 2.50	Low
2.51 – 3.50	Moderate
3.51 - 4.50	High
4.51 – 5.00	Very High

Source: Moidunny, 2009

The most respondents know daily schedule of ferry boats. The always passengers must know the daily program of ferry boat in being dependent completely. There are 50.86% and the largest group who are known the daily schedule of ferry board. Some of the respondents (7.43%) did not know and they have to go rarely and especially, they are old ages and pensioners.

The largest group of respondents is the people who don't know about insurance of ferry. It is apparent that the insurance arranged by ferry can be attractive the passengers. That can be required to sustain. If the accident is formed, the government subsides is certain to support the vulnerable persons. When the insurance is not made, it will be burden to government. In this survey, the strength of public insurance can be seen.

Commonly, the safety program can be known well by the most of respondents but there are still a little of respondents who does not know. The government has the duty and responsibility to save the passengers' lives. All of the respondents must know the safety program before accident. The prevention is better than the curing. The condition must be reformed.

The slightest group of respondents is very well known to follow the regulations prescribed by ferry authority. The greatest respondents of them don't know. This condition is bad.

There are over half of respondents who know or acquaint with the daily ferries program and condition, the data about "when and what ferry goes and comes" and "what ferries was good or not".

Under the IWT, there are three routes of ferry transportation operated and the passengers have to go the regular routes. There are some respondents who do not

perceive the staffs or officers of IWT. Mostly, the most of respondents notice or a little perceive with them and this circumstance can be seen in survey.

There are nearly half by half respondents who know the warnings, which the things must be carefully followed, or not. The condition is threat in safeguarding the passengers. That results overall mean score (2.65) can be interpreted as of knowledge level on ferry transportation system of IWT by respondents are just in moderate level, still need to explore acknowledgements more concerning the actions and preparedness of IWT.

4.3.3 Attitude of Respondents on the Ferry Transportation System of IWT

Some of respondents have to careful for the safety and others have the difficult attitude to follow the discipline for safety. The emphasizing of public attitude is very importantly required to make. In building the modern and developed nation, the governmental service must be good to get the best attitude from people. The study on attitude is really needed to measure in uplifting the services.

Table 4.4 Attitude of Respondents on the Ferry Transportation System of IWT

No	Variable	Yes	No
1	Reliable schedule by ferry of IWT	298 (85.14%)	52 (14.86%)
2	Worthy information about the ferry from IWT	188 (53.71%)	162 (46.29%)
3	Agree the standing disciplines of ferry	325 (92.86%)	25 (7.14%)
4	Like the seats of ferry	320 (91.43%)	30 (8.57%)
5	Cheap fare of ferry	278 (79.43%)	72 (20.57%)
6	Convenience transportation mode	283 (80.86%)	67 (19.14%)
7	Trust that is a safe trip while you travelling with ferry	246 (70.29%)	104 (29.71%)

Source: Survey Data, 2019

Table 4.4 shows that the most of respondents are reliable and trustworthy on the schedule made by ferry of IWT. The time is important for the daily arrangement of working schedule. The ferry program is partially concerned with the respondents' lives and it cannot be neglected. About that, the information released by IWT is very significant and vital in the working sector of respondents. In survey, there are over half of respondents who says that the information of IWT is worthy. The little group of respondents want to deny about the standing disciplines of ferry but the most of them like for safety and the seats of ferry. The most of them say that the ferry-fare is cheap in comparing the bus-fare from one side to one side of Yangon River. The greatest group of respondents say that the ferries are very convenient and comfortable in maritime. Sometimes, the weather is very hazardous and the private taxi boat is not safe in this condition.

4.3.4 Practice of Respondents in Ferry Transportation System of IWT

It is very interesting how the respondents face daily in travelling by ferry. Seven questionnaires are made about the practice for respondents.

Table 4.5 Practice of Respondent in Ferry Transportation System of IWT

No	Characteristics	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)	Mean score
1	Travel by public ferry boat of IWT	6 (1.7%)	24 (6.9%)	80 (22.86%)	104 (30%)	136 (38.9%)	3.97
2	Travel by private ferry boat	178 (51%)	80 (23%)	33 (9.43%)	38 (11%)	21 (6.0%)	1.67
3	Read and know the Warnings	38 (11%)	42 (12%)	156 (44.57%)	68 (19%)	46 (13.1%)	3.12
4	Keep an eye on the directions of ferry	36 (10%)	43 (12%)	105 (30.00%)	115 (33%)	51 (14.6%)	3.3
5	Buy ticket and pay fare for the trip	-	-	4 (1.14%)	22 (6.3%)	324 (92.6%)	4.9
6	Comply with the regulations of ferry	-	-	38 (10.86%)	49 (14%)	263 (75.1%)	4.64
7	Get a seat or place while travelling by ferry	21 (6%)	33 (9.4%)	38 (10.86%)	34 (10%)	224 (64.0%)	4.2

Source: Survey Data, 2019

Table 4.5 shows that the always passengers of respondents are 38.86%, often 29.71% and sometimes 22.86%. The most of the respondents have to travel with public ferries. The most of them do not travel with private ferries and pay most attention the public ferries. For the public social welfare, the sector of public ferries is necessary to be modernized.

The largest group of respondents 44.57% knows commonly the warnings of ferries. A little amount of them do not care it. Every passenger must care the warnings against the accidents. If the head of family-economy is in accident, the rest of followers can form a lot of trouble.

There is very good practice that there is zero person who do not pay the ferry-fare or do not buy the ticket on trip. Most of them always obey, or comply, the regulations of ferry. The warnings are needed to make seriously.

The most of the respondents had often kept an eye on the direction of ferry. The most of the respondents always get the seat or place and some of them have to travel in free styles or may be no place.

4.3.5 Behaviour of Respondents in Ferry Transportation System of IWT

If the behaviour of respondents is known, the authority men can make the required safety program against the accidents. In this survey, the seven questionnaires are made to explore the respondents' behaviour.

Table 4.6 Behaviour of Respondent in Ferry Transportation System of IWT

No.	Variable	Yes	No
1	Wear the life-jacket or safety equipment	8 (2.29%)	342 (97.71%)
2	Sit down on the veranda or dangerous zone	-	350 (100%)
3	Sit down on the upper floor of ferry	166 (47.43%)	184 (52.57%)
4	Unsafe sense while travelling or getting on the ferry	66 (18.86%)	284 (81.14%)
5	Take care the get-in and out of the ferry-boat	104 (29.71%)	246 (70.29%)
6	Try to know the information of the ferry transportation system	97 (27.71%)	253 (72.29%)
7	Inquisitive the weather condition before travelling	123 (35.14%)	227 (64.86%)

Source: Survey Data, 2019

Table 4.6 shows that most of the respondents say, they do not wear the life-jacket on accidents and some of them wear. On the sudden accidents, the wearing of life-jackets can be forgotten if it is not prepared in the mind. The safety equipment are needed when the private water taxi are driven because that kinds of ferry are unsafe. The public warnings are necessary to make continuously and take actions truly. There is good behaviour that anyone does not sit down on veranda or dangerous zone.

The nearly half of respondents say more favourable sitting on the upper floor than the low floor on trip. The beauty of river views and the fresh air of breeze can get more in the upper floor. There are nice condition that most of them are careful the get-in and out of the ferry. Sometimes, the accidents can be formed in the rush-hour while getting in and out of ferry. There are 72.29% of respondents who do not try to get the information of ferry transportation released by IWT. Some of them care that information. There are 64.86% of respondents who are not curious and inquisitive the weather conditions. In the rainy season, the heavy rain can form and anyone should not make trip with private small ferry in that time.

4.3.6 Awareness of Respondent in Ferry Transportation System of IWT

The study of public awareness is very important in consideration of perception of respondents. Therefore, the seven questions are used in interviewing. The following table 4.7 shows that the awareness of respondents. If the unsafe condition was faced, most of the respondents said that they should have knowledge very well to apply. There are no respondents that say “No”. The most of the respondents say that they need the awareness of warning in getting in and out of ferry. The smallest group of respondents says “no need of warning announcement”. Most of the respondents know they are necessary information released by IWT. The information of time schedule and the weather warning are very useful for them.

The most of respondents are neutral that understanding the construction and design of ferry that are made especially for the safety. They know that the public ferry is very better than the private small ferry and the public ferry is more safe time and fare. The overall mean score result (3.7) indicates that the awareness of respondents in ferry transportation system of IWT is in high level; obviously shown preparedness for respondents by IWT is fair.

Table 4.7 Awareness of Respondent in Ferry Transportation System of IWT

No	Variables	Strongly disagree (1)	A little disagree (2)	Neutral (3)	A little agree (4)	Strongly agree (5)	Mean
1	Having knowledge for the procedures arranged by IWT when you face the unsafe condition	-	12 (3.43%)	46 (13%)	85 (24%)	207 (59%)	4.4
2	Need to take care the get-in and out	38 (10.9%)	29 (8.29%)	49 (14%)	120 (34%)	114 (33%)	3.7
3	Well known the warning announcement of IWT	19 (5.43%)	26 (7.43%)	90 (26%)	115 (33%)	100 (29%)	3.72
4	Understanding the safe construction design and engine of ferry	16 (4.57%)	29 (8.29%)	121 (35%)	100 (29%)	84 (24%)	3.6
5	Getting good service quality than the other private boat	36 (10.3%)	39 (11.1%)	110 (31%)	85 (24%)	80 (23%)	3.2
6	Safe time consumed for waiting and travelling	10 (2.86%)	14 (4.00%)	85 (24%)	133 (38%)	108 (31%)	3.9
7	More benefit than other private ferryboat	26 (7.43%)	43 (12.3%)	68 (19%)	113 (32%)	100 (29%)	3.62
Overall mean score							**3.7**

Source: Survey Data, 2019

4.3.7 Perception of Respondents on Ferry Transportation of IWT

The perception and exception of respondents is vital in deciding the operation management of ferry transportation of IWT. The questionnaires are design with eight questions.

Table 4.8 Perception of Respondents on Ferry Transportation

No	Variables	Strongly disagree (1)	A little disagree (2)	Neutral (3)	A little agree (4)	Strongly agree (5)	Mean
1	Good Problem solving among the passengers on ferry by the crew	34 (9.71%)	30 (8.57%)	195 (55.7%)	50 (14%)	41 (11.7%)	3
2	Comfortable/ convenience ferry service with reliable schedules	10 (2.86%)	10 (2.86%)	46 (13.1%)	138 (39%)	146 (41.7%)	4.1
3	Satisfied with the Design and Construction of Ships	32 (9.14%)	37 (10.6%)	60 (17.1%)	140 40%	81 (23.14%)	3.6
4	Require to make more facilities on board	118 (33.7%)	84 (24%)	64 (18.3%)	52 (15%)	32 (9.14%)	2.42
5	Need to train the crew for hospitality and communicatio n with passengers	30 (8.57%)	40 (11.4%)	144 (41.1%)	81 (23%)	55 (15.7%)	3.26
6	Recommend for taking ferry service of IWT	10 (2.86%)	10 (2.86%)	43 (12.3%)	50 (14%)	237 (67.7%)	4.4
7	Not many defects on ferry system	28 (8.00%)	22 (6.29%)	98 (28%)	100 (29%)	102 (29%)	3.6
8	Getting the expected service of ferry system	8 (2.29%)	10 (2.86%)	47 (13.4%)	80 (23%)	205 (59%)	4.3
Overall mean score							3.6

Source: Survey Data, 2019

Table 4.8 shows the Perception and Expectation of Respondent on Ferry Transportation System of IWT. Problem solving among the passengers on ferry by the crew is said "good" by the few of the respondents. The most of the respondents reply that it is very comfortable and convenience ferry service with reliable schedules and satisfied with the Design and Construction of Ships. The most of respondents' answer that they don't require making more facilities on board and need to train the crew for hospitality and communication with passengers is neutral. Then, the most of respondents recommend strongly for taking ferry service of IWT and some say not many defects on ferry transportation. Perception of respondents on ferry transportation is in high level as per mean score results (3.6), expressing the most of the respondent hopes getting the expected service of ferry transportation.

4.3.8 Interpretation of Key Informants Interview at Inland Water Transport Department in Myanmar

The key informant interview is aimed to obtain the extremely important information about current situation and difficulties of implementation condition of inland water ferry transportation system in Yangon. The interview was focused on the perceptions and expectations of key persons who are working in the field of the ferry service provided by Inland Water Transport Department (IWT). This data is collected by understanding of the lived experiences, opinions, and perspectives of 6respondents from Inland Water Transport Department in Yangon Region. Key Informant Interview Questionnaire is same for all respondents but different points of view can be found as the position and responsibility.

Table 4.9 KII Interviews with Key Persons of Inland Water Transport Department

No	Key Person	No of Respondents
1	Captain of Cherry (1) from Pansodan-Dalla route	1
2	Second Engineer of Ro Ro-IV from Wahdan-Dalla route	1
3	Supervisor from Yangon-Khanaungto route	1
4	Assistant Manager from Pansodan-Dalla Station Office	1
5	Area Commander of Ferry Transportation System	1
6	Head of Transport Department of IWT	1
	Total	6

Source: Survey Data, 2019

The compilations of the findings of 5 key informant interviews are shown in the following:

Question: How do you serve for the passengers to provide good service in the Ferry Transportation System of IWT?

In Pansodan-Dalla ferry route, three ships, namely Cherry-1/2/3 are running Pansodan quayside and Dalla quayside to and fro daily. In Wahdan-Dalla ferry route, Ro Ro-IV, which is running Wahdan quayside and Dalla quayside to and fro daily. In Yangon-Khanaungto route, Ba-La type and "T" class vessels are running ferry transportation daily from Yangon quayside and Khanaungto quayside. Respondents are long year service, and are assigned for ferry transportation service providing with the responsibilities to manage and monitor the vessels and passengers to be safe, not to delay for the passengers , to manage the passengers and cargoes to be place systematically, and to get the good performance in daily routine of the service systematically, to get optimal output for the vessels plying on the river daily basis and to be beneficial for the public by using water transportation .

Question: Do you think that the distribution of information such as safety, law and regulations, warning, changing the daily routine, etc., is important for the passenger? How do you support it?

The distribution of information such as safety, law and regulations, warning, changing the daily routine, etc., is important for the passenger is strongly agreed from all respondents. If there will be any information, announcing on board, in public area and on the notice-board to inform the passengers as soon as possible.

Questions: What will be the perceptions on the impacts of a good transportation system for economic Development? Explain in brief?

The perceptions on the impacts of a good transportation system for economic development are as follows:

(a) Enhances supply chain efficiency

(b) Welfare of populations

(c) Economic growth in the region

(d) Support regional cooperation and integration

(e) Generating safety benefits

(f) Supports clusters and agglomerations

(g) Enhances job and labour market accessibility especially for semi-urban and metropolitan areas

(h) Increase productivity

(i) Increase job opportunity

(j) Getting larger pool of employees for the job market

(k) Opening new markets for business and increase business productivity

(l) Getting benefits for public welfare and cost saving mode of transport in economic growth.

Question: What are the difficulties concerned with the Ferry Transportation System that you face in your workplace?

Regarding with difficulties of the Water Ferry Transportation System, survey results are different in position. Captain often faces in workplace that the some passengers don't comply with the rules and regulations of the ferry system and some passengers carry the dangerous and prohibited cargo to the ferry-boat. Second Engineer often faced in workplace are the flaw of engine of vessels happen rarely and at that time , have to try to substitute another good ship in time for not to delay for the passengers. Supervisor often faced in workplaces are the some passengers want to do overloading on ship. Assistant Manager often faced in workplaces are that some passengers are late for the ship for the trip and try to get in hurry and it may cause the dangerous condition. Area Commander often faced in my workplace is drowning someone that used drugs or alcohol. Deputy General Manager, Head of Transport Department of IWT often faced in managerial level are; to invest to overcome the constraint Budget for having good facilities , to implement the new project of water transportation ,to maintain the waterway such as dredging .

Question: Express your perception to be an effective transportation system and what is your chief expectation about this transportation system?

To be an effective transportation system, respondents highlighted that it need reliable schedule, expert drivers, safety type of vessel, good conditions of engine, complying with the rules and regulations, having good procedures, buying ticket

conveniently, comfortable seat and clean area, reliable and safe transportation system that have been link with the function. It also needs to standardize, harmonize and simplify the regulations. The chief expectations of respondents is to give good service and safety for the passengers and cargoes in ferry trip by ferry-boat of IWT, to get good image of IWT and to get economic growth of the country in large extent and welfare maximization.

CHAPTER V
CONCLUSION

5.1 Findings

Transportation involves as one of the most important sector for socio-economic development. It can be seen as towns and villages situating close to waterways, railways and roadways are developing more than those which are distant from transportation routes. This is due to convenience in transporting goods from one place to another and ability to deal easily for socio-economic matter among the different places. Inland water transport is considered more energy efficient, emitting less CO2 per ton-km performed, compared to transport modes like road or rail. The bigger capacity amount of IWT means that the sector is able to carry more tons per mile per unit of fuel than what is possible with other modes. This benefits the climate and makes the sector relatively cost-efficient.

The efficiency of inland waterways vessels in developing countries is assumed to be lower than in developed countries due to the use of older engines, less updated technologies and vessel designs. The introduction of new technologies could therefore help to achieve much higher efficiency of economic growth. A distinction is made between newly built vessels and those with retrofitted technologies, or improvements of older systems. The latter may be unsafe and need to modernize existing old fleets, especially if they could still be used for a long period of time.

Inland waterways vessels can carry larger volumes of passengers and cargo resulting many benefits and economic growth. Ferry vessels are the most cost-efficient for point-to-point transportation of passengers, vehicles and commodities. This applies to traditional cargo such as agricultural products, industrial goods and construction materials but also to containers and even vehicles. Optimization can be achieved through the utilization of vessels in the public sector of inland water ferry transportation.

Inland water transport is more efficient mode of transport than other modes of transportation. It is also an economical mode of transportation due to its ticket prices

is cheap especially the ferry service of Inland Water Transport Department that provided public welfare even though the income is loss arising.

Among the passengers of ferry service, most passengers travelled daily from one side to side of Yangon to work. The most of the respondents believed the public ferries more than the private ferries. The most of respondents said the design and structures of government ferries are better than any private one when the trip was made in heavy rain. The safety was better and the life jackets and safety equipments were ready. In the bad weather condition or unsafe condition, life-jackets placed in the public ferries to be able use easily for the passengers. The smallest group of old age and the pensioners had rarely to travel by ferry. The students under the adult age had to also go every day.

The warnings, the awareness, and other knowledge sharing were made by the public ferries and the most of the respondents satisfied very much. About the occupation, the business owners are the smallest group among the respondents. The most of the respondents are basic workers and the low income persons. The respondents had to be dependent mainly on ferries because the public ferries cost low charges that was economy for the most of respondents. The most group of respondents was the married status and the members of families followed them. Most of the respondent was survival for daily income for families. An amount of students can be seen in travelling by ferry.

In Chapter three, it was described that Inland Water Transport Department (IWT) has been well organized since many years ago. Inland Water Transport is one of the state owned enterprise under the Ministry Of Transport and Communications. The total quantity of 258 vessels or fleet was arranged in the current status. Inland Water Transport along total service 9219 miles was made in Myanmar's rivers. In Yangon Region, there are three routes of ferry transportation operated and provided the daily basis of the passengers.

In survey result, the most of respondents have the awareness of the importance of information and this can be seen in survey. The information released by IWT is very significant and vital in the working sector of respondents. In survey, there are over half of respondents who says that the information of IWT is worthy.

The largest group of respondents is the people who don’t know the best about insurance of ferry. If the accident is formed, the government subsides is certain to support the vulnerable persons or low income families. When the insurance is not

support, there will not be social protection by the government. It is apparent that the insurance arranged by ferry can be attractive the passengers. That can be required to sustain. Commonly, the safety program can be known well by the most of respondents but there are still a little of respondents who does not know. The government has the duty and responsibility to distribute the safety program to the public. All of the respondents must know the safety program.

The slightest group of respondents very well-known to follow the regulations prescribed by ferry authority. The greatest respondents of them don't know this. There are over half of respondents who know or acquaint with the daily ferries program and condition, the data about "when and what ferry goes and comes" and "what ferries was good or not".

There are 50 percentages of respondents who know the warnings that must be carefully followed. For other 50 percentage of respondents, it will be as a threat in safeguarding the passengers. The most of respondents are reliable and trustworthy on the schedule made by ferry of IWT. The time saving is important for the daily arrangement of working schedule. The ferry program is partially concerned with the respondents' daily lives and it cannot be neglected.

The little group of respondents want to deny about the standing disciplines of ferry but the most of them like for safety and the seats of ferry. The most of them say that the ferry-fare is cheap in comparing the bus-fare from one side to one side of Yangon River. The greatest group of respondents say that the ferries are very convenient and comfortable. Sometimes, the weather is very hazardous and the private taxi boat is not safe in this condition.

The most of the respondents prefer to travel with public ferries. The most of them do not travel with private ferries and pay most attention the public ferries. For the public social welfare, the sector of public ferries is necessary to be modernized. The largest group of respondents knew commonly the warnings of ferries. A little amount of them do not care it. Every passenger must care the warnings against the accidents. If the prime mover of family-economy was in accident, the rest of followers can be faced a lot of trouble.

There was a very good practice that there is zero person who do not pay the ferry-fare or do not buy the ticket on trip. Most of them obey, or comply, the regulations of ferry. Some of the respondents had kept an eye on the direction of

ferry. The most of the respondents get the seat or place and some of them have to travel as they like or it may be no place.

Very few amounts of the respondents wear the life-jacket on board but most of them did not wear. There is no safety equipment in the private water taxi or small boats and those kinds of ferry are unsafe. The public warnings are necessary to make continuously and take actions really. There is a good behaviour that anyone does not sit down at dangerous zone.

Nearly half of respondents say more favourable to sit the upper floor than the low floor on trip. The beauty of river views and the fresh air of breeze can get more in the upper floor. There are nice condition that most of them are careful the get-in and out of the ferry. Sometimes, the accidents can be formed in the rush-hour while getting in and out of ferry.

Most of the respondents know necessary information released by IWT. The information of time schedule and the weather warning are very useful for them. An amount of respondents says that they understand the construction and design of ferry that are made especially for the safety. They know that the public ferry is better than the private small ferry and the public ferry is safer. Problem solving among the passengers on ferry by the crew was said "good" by the few of the respondents as the Perception and Expectation of Respondent on Ferry Transportation System of IWT. The most of the respondents felt very comfortable and convenience ferry service with reliable schedules and satisfied with the Design and Construction of Ships.

The most of respondents don't require making more facilities on board and need to train the crew for hospitality and communication with passengers is neutral. Then, the most of respondents recommend strongly for taking ferry service of IWT and say not many defects on ferry system. The most of the respondent get the expected service from ferry system of IWT.

All of the key persons serviced in IWT had to say that the distribution of information such as safety, law and regulations, warning, changing the daily routine, etc., is important for the passenger. For the safety of passengers, the alarm system can be better if the inland water transportation system will be upgrade internationally. Mostly, the related officers had the difficulties with the Ferry Transportation System in facing in workplace that some passengers did not comply with the rules and regulations of the ferry system and some passengers who carry the dangerous and prohibited cargo to the ferry-boat. It was needed to reform.

The distribution of information such as safety, law and regulations, warning, changing the daily routines was important for the passenger. If there will be any information, Captain on board must try to inform my team on board. To be an effective transportation system, the schedule must be reliable and should be appointed expert drivers. The safety type of vessel should be substituted in the olds. All of the officers of public ferries tried to provide ferry transportation and manage the engine room to be safe and not to delay for the passenger. This condition was very good. The hopes of office have been fulfilling to sustain in the work and get the good performance in daily routine of the service systematically.

The difficulties concerned with the Ferry Transportation System are to invest to overcome the constraint Budget for having good facilities, to implement the new project of water transportation, to maintain the waterway such as dredging. The chief expectation of the most of respondents of key persons from the department was to give good service, safety for the passengers in their trip, to get good image of IWT and economic growth of the country

Despite the development in railways, roadways, airports and bridges, the slow transportation by waterways could have lesser role through out of the country but according to population growth rate, limitation in roads, bridges, railways and airways have negative impact on local people, so that travelling by waterways is still an essential necessity.

5.2 Recommendations

The impacts of a good transportation system will be enhancing opportunities of job and labour market accessibility especially for semi-urban and metropolitan areas, increase productivity, getting benefit for public welfare and cost saving mode of transport and economic growth. A good transportation system for economic development will enhances supply chain efficiency, Welfare of populations, Economic growth in the region, Support regional cooperation and integration, Generating safety benefits and Supports clusters and agglomerations.

With the help of the respondents there are some important things that could be suggested to ferry service system of IWT in order to enhancement the improvement of the customer’s satisfactions as well as perception. Now there are water vessels which could run as fast as car and train so that the time consumption of the waterways can be

reduced. Despite the speed of high speed water vessels, the stability and safety of the passengers are still need to be considered.

The pricing of tickets for passengers, cargo and vehicles should be based on the cost of each routine of inland water ferry transportation in Yangon region. Insurance, one of the social protections to cover risk for the passengers, is needed to manage by Inland Water Transport Department.

The current political changes in Myanmar together with the development of economy will definitely accompany the increase in transportation of passengers and cargoes. In accordance with the strength relating to geographical situation and good economic resources in Yangon region, Inland Water Transport System should be expanded as follow;

(a) To update the old and inappropriate water vessels with modernize suitable vessels which can be used in accordance with the safety regulations
(b) To maintain the river ways and navigation aids systematically
(c) To develop container barge system for transportation of cargoes in IWT
(d) To develop advance loading and unloading port facilities implementation
(e) To upgrade and build new ports in accordance with the needs of passengers and cargoes loading
(f) To integrate the waterway transport with multimodal transportation system
(g) To promote the effective schedule of routes which will connect convenience time with multimodal transportation system for passengers and cargoes
(h) To extend the appropriate training for Human Resource Development to be able to participate in advanced technology of transportation

Nowadays, inland water ferry transportation is beneficial for the transport of cargoes/passengers and vital for the poor as well as for the competitiveness and growth of the economy as it is the cheapest mode of transport compared to road or rail in Yangon region.

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Appendix-A

YANGON UNIVERSITY OF ECONOMICS

Executive Master of Public Administration Programme

Survey Questionnaires

My name is Tin Zar Oo. I am a candidate of EMPA 16th Batch, Department of Applied Economics, Yangon University of Economics. I am writing a master thesis about "A Study on Customer Perception of Ferry Transportation System Provided by IWT in Yangon Region". I would like to request you to answer the all questions on this survey questionnaire for my thesis.

This survey questionnaire takes a few minutes to complete. The answer of respondents will be saved as confidential. The data will be used only for Master Thesis of EMPA. I am very thankful to you for your coordination and cooperation to complete this questionnaire.

Tin Zar Oo

Roll No. 70

EMPA 16th Batch

Yangon Region

July, 2019

(A) Demographic Characteristics of Respondent

No	Characteristics	Tick(√)
1	Gender (a) Male (b) Female	
2	Age (a) Under 18 years old (b) Between 18 and 30 years old (c) Between 31 and 45 years old (d) Between 46 and 60 years old (e) Above 61 years old	
3	Marital Status (a) Single (b) Married (c) Others	
4	Occupation (a) Government Employee (Staff/ Officer) (b) Business Employee (c) Business Owner (d) Student (e) Others (Worker, Hard Lobour ,Vendors, Retiree, Dependent, etc.)	
5	Education Level (a) Basic Education Primary School (b) Basic Education Middle School (c) Basic Education High School (d) University / Diploma (e) Degree Holder (f) Master Degree and above	
6	Income per month of respondent (a) Low (under 150000 MMKs) (b) Medium (between150000 & 40000MMKS) (c) High (Above 400000 MMKS) (d) No income	
7	Number of Family Members (a) Under 3 members (b) Between 3 and 5 members (c) Above 6 members	

Types of Respondents

No	Kind of Respondent	Number of Respondents
1	Passengers from Dala	144
2	Passengers from Seikkyi	36
3	Passengers from Twantay	35
4	Passengers from Khanaungto	42
5	Passengers from Kunggyankone	20
6	Passengers from Yangon	46
7	Others	27
	Total	350

(B) Knowledge on Ferry Transportation System of IWT by Respondents

No.	Variables	5	4	3	2	1
1	Know the daily schedule of ferry-boat					
2	Know the insurance programme for using ferry					
3	Understand the safety programme					
4	Recognize the regulations prescribed about ferry transportation system					
5	Be acquainted with the daily moving boats					
6	Perceive the officer or staff or crew from ferry transportation system					
7	Hear the warning of not-to-do things while travelling by ferry-boat					

Key Note

1. Don't Know 0%
2. A little 25%
3. Know 50%
4. Well Know 75%
5. Very well Know 100%

Attitude of Respondents on the Ferry Transportation System of IWT

No	Variable	Yes	No
1	Reliable schedule by ferry of IWT		
2	Worthy information about the ferry from IWT		
3	Agree the standing disciplines of ferry		
4	Like the seats of ferry		
5	Cheap fare of ferry		
6	Convenience transportation mode		
7	Trust that is a safe trip while you travelling with ferry		

Practice of Respondent in Ferry Transportation System of IWT

No	**Characteristics**	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
1	Travel by public ferry boat of IWT					
2	Travel by private ferry boat					
3	Read and known the Warning of ferry					
4	Keep an eye on the directions of ferry					
5	Buy ticket and pay fare for the trip					
6	Comply with the regulations of ferry					
7	Get a seat or place while travelling by ferry					

(C) Behaviour of Respondent in Ferry Transportation System of IWT

No.	Variable	Yes	No
1	Wear the life-jacket or safety equipment		
2	Sit down on dangerous zone		
3	Sit down on the upper floor of ferry		
4	Unsafe sense while travelling or getting on the ferry		
5	Take care the get-in and out to the ferry-boat		
6	Try to know the information of the ferry transportation system		
7	Inquisitive the weather condition before travelling		

(D) Awareness of Respondent in Ferry Transportation System of IWT

No	Variables	Strongly disagree	A little disagree	Disagree nor agree	A little agree	Strongly agree
1	Having knowledge for the procedures arranged by IWT when you face the unsafe condition					
2	Need to take care the get-in and out					
3	Well known the warning announcement of IWT					
4	Understanding the safe construction design and engine of ferry					
5	Getting good service quality than the other private boat					
6	Safe time consumed for waiting and travelling					
7	More benefit than other private ferry-boat					

(E) Perception and Expectation of Respondent on Ferry Transportation System of IWT

No	Variables	Strongly disagree	A little disagree	Disagree nor agree	A little agree	Strongly agree
1	Problem solving among the passengers on ferry by the crew					
2	Comfortable and convenience ferry service with reliable schedules					
3	Satisfied with the Design and Construction of Ships					
4	Require to make more facilities on board					
5	Need to train the crew for hospitality and communication with passengers					
6	Prefer the ferry of IWT than other private boat					
7	Recommend for taking ferry service of IWT					
8	Not many defects on ferry system					
9	Getting the expected service of ferry system					

Appendix – B

Key Informant Interview for Deck Officer of Ferry-Boat

School Code (if relevant)	Date (dd/mm/yy)	Interview number

To be completed by the interviewer

Background Information of Respondent

1. Designation : ( )
2. Working Experience : ( ) Years
3. Assignment : ( )
4. Current place of work : ( )

Q(1) How do you serve for the passengers to provide good service in the Ferry Transportation System of IWT ?

Q(2) Do you think that the distribution of information such as safety, law and regulations, warning, changing the daily routine, etc, is important for the passenger ? How do you support it ?

Q(3) What will be the impacts of a good transportation system for economic development? Explain in brief?

Q(4)What are the difficulties concerned with the Ferry Transportation System that you face in your workplace ?

Q(5) Express your perception to be an effective transportation system and what is your chief expectation about this transportation system ?

Key Informant Interview for Engine Officer of Ferry-Boat

School Code (if relevant)	Date (dd/mm/yy)	Interview number

To be completed by the interviewer

Background Information of Respondent

1. Designation : ( )
2. Working Experience : ( ) Years
3. Assignment : ( )
4. Current place of work : ( )

Q(1) How do you serve for the passengers to provide good service in the Ferry Transportation System of IWT ?

Q(2) Do you think that the distribution of information such as safety, law and regulations, warning, changing the daily routine, etc, is important for the passenger ? How do you support it ?

Q(3) What will be the impacts of a good transportation system for economic development? Explain in brief?

Q(4)What are the difficulties concerned with the Ferry Transportation System that you face in your workplace ?

Q(5) Express your perception to be an effective transportation system and what is your chief expectation about this transportation system ?

Key Informant Interview for Supervisor of Ferry Transportation System

School Code (if relevant)	Date (dd/mm/yy)	Interview number

To be completed by the interviewer

Background Information of Respondent

1. Designation : ( )
2. Working Experience : ( ) Years
3. Assignment : ( )
4. Current place of work : ( )

Q(1) How do you serve for the passengers to provide good service in the Ferry Transportation System of IWT ?

Q(2) Do you think that the distribution of information such as safety, law and regulations, warning, changing the daily routine, etc, is important for the passenger ? How do you support it ?

Q(3) What will be the impacts of a good transportation system for economic development? Explain in brief?

Q(4)What are the difficulties concerned with the Ferry Transportation System that you face in your workplace ?

Q(5) Express your perception to be an effective transportation system and what is your chief expectation about this transportation system ?

Key Informant Interview for Senior Officer (Managerial Level) of Ferry Transportation System

School Code (if relevant)	Date (dd/mm/yy)	Interview number

To be completed by the interviewer

Background Information of Respondent

1. Designation : ( )
2. Working Experience : ( ) Years
3. Assignment : ( )
4. Current place of work : ( )

Q(1) How do you serve for the passengers to provide good service in the Ferry Transportation System of IWT ?

Q(2) Do you think that the distribution of information such as safety, law and regulations, warning, changing the daily routine, etc, is important for the passenger ? How do you support it ?

Q(3) What will be the impacts of a good transportation system for economic development? Explain in brief?

Q(4)What are the main difficulties concerned with the Ferry Transportation System that you face in your workplace ?

Q(5) Express your perception to be an effective transportation system and what is your chief expectation about this transportation system ?

Appendix-C

Cherry (1), Ferry Ship in Pansodan-Dalla Route in Yangon Region

Source: MOTC, IWT

RO RO (3), Ferry Ship in Wahdan-Dalla Route in Yangon Region

Source: MOTC, IWT

“Ba La” Type Ferry Ship in Yangon-Khanaungto Route in Yangon Region

Source: MOTC, IWT

Appendix-D

Income from Ferry Transportation of Pansodan – Dalla Routes

(Kyats)

No	Fiscal Year	Total Cycles	No. of Passengers	Income from passengers	Income from cargo	Total Income
1	2007-2008	17082	17514449	115499178	12908970	128408148
2	2008-2009	13983	18253579	90683845	13920450	104604295
3	2009-2010	16699	18069939	107698080	14495540	122193620
4	2010-2011	16690	18261841	109272502	14517670	123790172
5	2011-2012	16742	11945332	414204782	42394009	456598791
6	2012-2013	16700	10218407	517963370	53228760	571192130
7	2013-2014	16652	9663369	941545650	36310510	977856160
8	2014-2015	16825	9593697	967016700	3961500	970978200
9	2015-2016	17339	9791270	1028366200	73527000	1101893200
10	2016-2017	17030	9284421	1080142300	93872200	1174014500
11	2017-2018	17044	9253588	1046762900	101327200	1148090100

Source: MOTC, IWT

Income from Ferry Transportation of Wahdan- Dalla Routes

(Kyats)

No	Fiscal Year	Total Cycles	No. of Passengers	Income from passengers	Income from cargo	Total Income
1	2007-2008	3162	149493	1459315	112474235	113933550
2	2008-2009	2352	169063	958024	86323370	87281394
3	2009-2010	2585	107136	1071128	92401330	93473458
4	2010-2011	2244	101320	1013431	78402180	79415611
5	2011-2012	2218	57972	1561825	110600706	112162531
6	2012-2013	2177	145541	1853300	144882930	146736230
7	2013-2014	2314	62119	6074550	212030890	218105440
8	2014-2015	2519	87361	8736100	246766870	255502970
9	2015-2016	2884	102226	10408100	271368210	281776310
10	2016-2017	3327	124459	13632300	330725120	344357420
11	2017-2018	3390	125085	13387300	352004360	365391660

Source: MOTC, IWT

Income from Ferry Transportation of Yangon– Khanaungtoe Routes

(Kyats)

No	Fiscal Year	Total Cycles	No. of Passengers	Income from passengers	Income from cargo	Total Income
1	2007-2008	3509	1150425	22421810	-	22421810
2	2008-2009	3360	1084593	19720097	-	19720097
3	2009-2010	3464	1055760	21115200	7220	21122420
4	2010-2011	3459	1083177	21663540	15000	21678540
5	2011-2012	3395	1321183	54535074	805910	55340984
6	2012-2013	3484	1386266	69313300	757130	70070430
7	2013-2014	3318	1327451	128511400	1626290	130137690
8	2014-2015	2983	1128967	113466700	1414390	114881090
9	2015-2016	2879	782778	99072300	1369540	100441840
10	2016-2017	2678	575180	114462600	1038550	115501150
11	2017-2018	2653	483538	97429000	776450	98205450

Source: MOTC, IWT