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WORLD MARITIME UNIVERSITY
MALMÖ, Sweden

SAFETY AND ECONOMIC ASPECTS OF INLAND NAVIGATION
ON THE AMAZONIA RIVERS

by

Jaime Quintana Marsano

Peru

November 1985

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A dissertation submitted to the World Maritime University in partial fulfilment of the requirements of a Master of Science degree in MARITIME SAFETY ADMINISTRATION (MARINE ENGINEERING).

The contents of this paper reflect my own personal views and are not necessarily endorsed by the UNIVERSITY.

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TO THE PEOPLE WHO WORK IN
THE RIVERS OF THE AMAZONIA
FROM WHICH I HAD BEEN WITNESS
OF THEIR DAILY EFFORT FOR THE
CONSTRUCTION AND ENLARGEMENT
OF MY COUNTRY

A B S T R A C T

During the las decade a huge natural region of my country called "Amazonia" underwent a rapid transport development due to the discovery of oil resources.

The fluviatic transport system increased as a consequence in a fast way and in a short period of time, suffering all the while from the lack of a policy.

*This study trys to analize the phenomena and evaluate the actual situation. It was difficult to find information and that was one of my problems which means that all the topics are not discussed in depth. I hope that through this breif review of the transport system we can get an Idea of the situation and from this we can propose some suggestions for the future development.

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CHAPTER I

INTRODUCTION

Normally in situations of rapid growth the head loses part of body control, and in the same way if a region rapidly increases its economic activities problem can arise if the government do not make the correct decisions and in the right time.

I was witness to a part of this evolution in the Amazonia Region. The first visit was 22 years ago and at that time the region had a regular transport system through the rivers with the rest of the country and good communication with other countries via the Amazonas River. The second visit was during the years 1977 and 1978, at that time I worked in the Maritime Administration dealing with security aspects. During those two years I observed a big change in the zone, a lot of shipbuilding activities, building of the ports, and increase of the population. All the activity -- was based on the oil business. It was a good time with -- easy money, but there was not enough legislation to regulate the activity.

This situation created a certain caos. The third opportunity to visit the region was in 1983 and it was a perfect time to analyze all the projects that I had seen started -- year ago. It was interesting to recall this experience and write something about it.

There are many things important to write about, but the problem is with the information available because there was not statistical information, that way I decided to get a general view in various aspects such as: the region, ports, fluviatic fleet and the safety of navigation.

I hope that at the final of this study we can get a -- better understand about the particular phenomena which affect the normal development of certain regions during a period of time.

CHAPTER II

2. The Peruvian Amazonia and Their Rivers

2.1 The Area and Population

In Geopolitics there are two phrases "the rivers join" and "the mountains divide". The river is the vertebres column of the geopolitical development in all its course. It receives the confluence of other little rivers and is the route of communication between the populations which live along - - their shores.

In the case of Peru are three natural frontiers, with Brazil, Colombia and Ecuador.

The Amazonia Region does not have relations with the political division of the country, but includes the departments of Amazonas, Loreto, Ucayali, San Martin and Madre de Dios and certain parts of the departments of Cajamarca, Huanuco, Cerro de Pasco, Junin, Ayacucho, Cuzco and Puno.

The term 'deparment' is used for the large areas of Perú made up of provinces which have joined - for geographic or political reasons. We can make some comparisons with the other natural regions. Perú has an area of 1'285,215.6 Km². The extension of the Amazonia is 747,288 Km², five times the -- coastal area of 144,213 Km² and nearly double the mountain saw of 419,529 Km², but there is relation between the area and population.

According to the census of 1980 the Department of Loreto (478,336 Km²) has only 620,200 inhabitants or 1.29 inhabitants/Km². The population of Peru in that census was 18'560,000 inhabitants or 14.44 inhabitants per Km². If we make a comparison between the general average of the country and the Department of Loreto we find a relation of 11.2 to 1, the same relation are the - - other Departments of the Amazonia.

2.2 The Geography and Hidrography

The rivers of the Amazonia born in our mountains range called "Los Andes", and this mountains divided the country from North-South in three natural regions, the coast, the mountain saw, and the Amazonia, but if we want to know about the rivers we need to start with the mountains.

From the Vilcanota ties, the Central Andes take direction to the North-West and it is divided - into three mountain ranges:

- The Occidental: Which separates the water which goes to the Pacific.
- The Central: Which divides the water of the rivers Apurimac and the Urubamba. The first starts from the Filafro Lagoon and the second in the Vilcanota tie.
- The Oriental: Which divides the Interandina region from the Amazonia, namely the waters of the Urubamba and the Madre de Dios. -- This range of mountains are cut by the Urubamba River in the Mainiqui Pongo.

These mountains ranges meet in the Pasco tie and at this point one finds the origin of five big - rivers, Marañon and Huallaga which go to the - - North-West, Perené which flows East, Pachitea -- which flows to the North-East, and Mantaro which goes to the South.

From the Pasco tie, the Septemtrional Andes go to the North-West and are divided into three mountain range:

- The Occidental which resembles a big wall dividing the group of the Pacific from the Amazo--nia.
- The Central is the divortium aquarium of the Marañon and the Huallaga.
- The Oriental which divided the waters of the Huallaga and the Ucayali.

The Marañon River cuts the Central and Oriental range of mountains in points called "Pongos" of Retama and Manseriche, and then goes to the Amazonia.

Moreover, of this ranges of mountains, in the -- Andes there is a halter of the Oriental range of mountains called Ultra-Oriental in Perú and Moa in Brazil, which follows the right shore of the Ucayali river and divides the water of the river from those which go to the Madre de Dios, Purús, Yavarí and Yurua Rivers.

There is a big amount of water coming from the - ice mountains and storm rains, joining together to form the King of the rivers a big collection of one thousand rivers and nearly one million - uneven grounds and rivulets, which is the junction of the Marañon and Ucayali, they are the axle of communication of the Nor-Orient of Perú whose gra

vity center is the port of Iquitos. The junction of the rivers Marañon and Ucayali is the Amazonas and the river in Perú has others affluents such as Napo, Putumayo, Yavarí, Yurua, and Purus.

2.2.1 Nature of the Soil

The Nature of the soil in the high jungle (from 500 to 2000 meters above sea level) is of rocks, stones and clay.

The low jungle which is considered (less than 500 mt. above the sea level) the type of the soil is different, is of clay and the jungle is vast and flat with low inclination. The soil is covered by humus and wet all the year. It is impossible for the sun rays to penetrate because the vegetation covers at different levels. - The soil is soft and without consistence, that means it is practically imposible to build roads. It is difficult to find - places with rocks or stones. In case you want to build a road, you need to build a lot of bridges to join the roads.

X 2.2.2 Climate

The climate is hot, humid and rainy, a factor which contributes to the chemical descompositon of the soil.

The temperature is high, 28°C average, the minimum is 20°C from November to April and the maximum 40°C.

The humidity at dawn is high but at midday is less, ranging from 80% to 100%. During May and June there are heavy fogs along the rivers. The average rain fall from December to April is 4000 mm.

2.2.3 Vegetation and Animals

The Amazonia contains one of the mayor forest reserves in the world with a wide variety of trees for example we can find mahogany and cedor, very highly appreciated for commercial purposes. Palo de cruz one of the finest and most difficult to find, Palo sangre which has a density of (1.1) and does not float in the water, very hard and compact. Ebony, others such as Chomta, Chambira and Pijuayo. A large lumber industry serving both the national and international markets has developed from the abundance of wood available in the region. In the case of wild animals, there are different forms of wild life -- protection agencies, such as forest police. We can find different varieties of turtles, monkeys, snakes, birds, fish, etc.

X 2.3 The Rivers

The Rivers in the region of our Amazonia are natural routes of movement and communications and consequently. In one way or another all of these rivers can be used for navigation purposes, but with different types of ships, boats, and canous. The rivers beds are normally clean without stones, except in the case of Alto Ucayali.

A predominant characteristic is the existence of large shores along the rivers, which are normally used for agricultural purposes, namely the growing of rice and maize and other types of fast growing harvest.

The rivers sometimes change their beds and transform into Lagoons called "Cochas". In the concave sector of the river beds the erosion of the shores is intense and this phenomenon increases in the parts in which man cuts down trees, in that way not only destroying the jungle, but also destroying the agriculture fields and the towns near the shores.

The narrow rivers with deep bed are the best for navigation. The beds normally consist of sand and mud. The water is obliged to follow the route, some of these rivers present some rocks and stones in the high part of the bed, they are called "Cashueras".

The wide rivers have different routes, but for navigation purposes you need to look for the main channel.

Sometimes in the wide rivers during the rainy season the main channel changes its route, specially in rivers with sand and mud, and when the river level falls we can get more than one surprise.

X For the purpose of this work we need to concentrate our attention on the following rivers.

2.3.1 The Huallaga River

The Huallaga is the principal affluent of the Marañon River, we can use in navigation and is an important route of communication for a big area of agricultural land. Now it is the only way to communicate with Yurimaguas Port, because the route to communicate with the coasts is not finished yet. From the port of Yurimaguas we can transport enormous amounts of agricultural products and cattle to the coast. The direction of the river from the source is to the North, then changes to the North-East in Panao and changes to the North-West to Santa María del Valle, and then takes a North-West route to Yurimaguas and follows the North-North-East direction to meet Marañon River in Lat. 05° 10'S and Long. 75° 34' 50"W, 463 mt. above sea level.

The rivers length is 732 miles but only 135 miles from Yurimaguas to the junction with the Marañon river are navigable.

We can use ships of 4 foot drafts all year around the shores of the Huallaga near the junction with the Marañon are inundated -- specially in the rainy season.

Regimen of the Water.-

The color of the water is brown similar to the Marañon -- the speed of the current is 3 Km. the river level rises from September to March, and the level falls from April to

August.

The variance of level between one season and the other is about 36 feet.

Conditions for Navigation.-

During the rainy season the water flows quickly and ship operations need to be aware of floating trunks. In this season ships of 10-foot-draft can navigate to Yurimaguas but it is recommendable to navigate only during the day or on very -- clear nights. During the dry season the river is more clear of trunks but there are sometimes trees in the bottom as stick called "quirumas" that are very dangerous and it's recommendable to navigate with maximum 4 feets draft.

2.3.2 The Maranon River

This river is divided into 2 sections - Alto Maranon from the beginning to the Pongo of Manseriche and the Bajo Maranon from that Pongo to the junction with the Ucayali.

- Alto Maranon: From the beginning to the Pongo of Manseriche follows a dangerous route in South-North direction to this pongo. This part is particulary very hard for navigation inclusive for canoes.

- Bajo Marañon: This section is from the Pongo of Manseriche to the confluence with the Ucayali which form the Amazonas near the Port of Nauta. - The direction is West-East. It is wide with a lot of curves. The bed is made of sand and certain parts little stones.

✓ Regimen of Waters.-

The rainy season starts in September and finishes in March. In April start the dry season. The difference in the level of -- water between the 2 seasons is approximately 25 feet.

✓ Conditions for Navigation.-

All the year round it can be navigated by ships of 4 foot drafts. In the rainy sea^uson with ships of 6 foot drafts, but there are a lot of floating trunks and it is dan^ggerous particulary when navigation is at night. It is possible to navigate to the confluence with the Huallaga. In dry sea^uson is possible to navigate with vessels of 4 foot drafts, during July and August is -- normal to have heavy fogs on the river. Generally during the dawn, there are some -- days taht it is impossible to navigate. The speed of the current is 3.5 knots.

2.3.3. The Ucayali River

The formation of the river is the confluence of the Urubamba river origin in the Vilcanota tie, and the other in the Apurimac. This river start in a place called Atalaya and in this part the river is -- called Alto Ucayali and when this river - confluence with the Pachitea river is -- called Bajo Ucayali. This river carries a lot of water. Is very large and sinuous has a lot of islands. The wide is from 400 mt. to 2000 mt. The current is 4 -- knots. The total lenght is 791 miles.

- Alto Ucayali: Starts in the confluence of Urubamba and Apurimac and continue to the confluence with the Pachitea, in this section the current is from 4 to 8 knots. The - bed of the river has stones and - rocks. The navigation is very hard.
- Bajo Ucayali: Starts in the confluence of Pachitea and finish in the confluence with the Maranon. In this section of the river the water is - more quiet and the current is 4 Km. The bed of the river has mud and -- sand.

Regimen of the Waters.-

The river has two season with a big change in the water level.

During the rainy season the water increase gradually and get the top level in February. The dry season start in April. The fluctuation of the water between the two seasons is 5 mt.

Conditions of Navigation.-

It is possible to navigate all the year from Pucalpa to the confluence with the Marañon - with 8 foot drafts and from Bolognesi to - - Pucalpa with 4 foot drafts. It is possible to navigate during the night all the year. During the rainy season there are a lot of flowing trunks and the cooling systems suffer because the water contains sediments and damage the system. This river is vital for the communication between the jungle and the - - coast through the transandina road -- assures the transport commodities from the coast to all the cities and towns in the Amazonia and permits for the new colonizations to use the potential riches.

The shores along this river have a lot of - sediments of limus and humus which allow to have good harvest.

2.3.4 The Amazonas River

The Amazonas born in the confluence of the Marañon and Ucayali rivers. It has a length of 3,762 Km. If we consider the length of the Ucayali 2,738 Km. we have a total of 6,500 Km.

The width in the confluence of the Marañon and Ucayali is 4000 mt., the width is variable from 2000 to 5000 mt. in the Peruvian zone and from 2500 mt. to 15 Km. in Brazil.

The volume of the water in the mouth of this river is from 200,000 to 300,000 cubic meters per sec. during the rainy season and 100,000 during the dry season. This volume of water get the Amazonas the title of the river carrying much water in the world. The depth is variable depending the width - from 10 to 30 mt. in Perú and from .75 to 100 mt. in Brazil. There are some parts in which the depth is about 200 mt.

Regimen of the Waters.-

Depends in the level of the Marañon and Ucayali specially during the rainy season. The difference of level between season is about 36 feet.

Condition for Navigation.-

There is not problem to navigate during the rainy season. It is possible to navigate - from Belen do Pará to Iquitos with vessels of 30 foot drafts and all the year round -- with vessels of 18 foot drafts.

CHAPTER III

3. PORT STRUCTURE.

3.1 The Port Significance

After the discription of the main characteristics of the Amazonian Rivers, which allow the intercommunication between the cities in the Amazonic Region, it is important to continue with a general review of the Ports in the cities of Yurimaguas, Iquitos and Pucalpa, and through the last one with the use of the transandina - road and the interconnection of the region to the mountain saw and the coast. In the future we will probable start to use of the road from Olmos to Yurimaguas and from Satipo to Atalaya which are now under construction.

If we can understand the importance of the Ports it's possible to formulate general policies for the development of an efficient Port structure adequate to the Geographic Characteristics of the zone such as climatologic and fluviatic, and give the support to different economic activities. -- All these activities require appropriate places - which are capable of filling the requirements of consumption and productives of differents sectors such as:

- Agricultural.- In this sector all the land - along the shores of the rivers is principally suited for the cultivation of grains such as: rice, maize and other types of temporary harvest crops and others such as

beans, peanuts, etc. With the connecting support and incentive of good river transport and port facilities, the people of this region can produce very good harvests. Good storage, transport and distribution facilities, for example are essential. Further more, it is important to support them with an efficient commercialization system. The above mentioned products are capable of satisfying the needs of the local market and the surplus can be exported as well to international markets at a very low price. It is interesting to note that Perú imports US\$ - - 500'000,000 per year of food.

- Industrial.-

- Timber is the main industrial activity of the people in this zone. It consists of the manipulation of the tree trunks, part which go to lamination and the other part to become plywood. It is ironic that we import US\$ 20'000,000 per year in newsprint and other types of timber by products when we have one of the biggest forests in the world, sometimes we import wood, pine for example.

- Agro-Industrial: There is a variety of indigenous fruits, but there are only a few canning factories which with some support of the government could become big industries.

- Porcelain and Glass: The sand along of some rivers is one of the purest and particularly well-suited for producing porcelain and glass of the best quality. - We import glass of different types of about US\$ 10'000,000 per year.

- Oil: In the last few years this activity has increased in importance to the National Economy. Now we can export the surplus of our own production which is approximately 60,000 barrels per day. With the construction of Pipe to the Coast we can transfer production from the fields in the Amazonia to the ports but this activity continues in new fields.

- Commerce: It is a big demand of products from the industrialized cities of the coast, and this region required to maintain the rhythm of work and regional development.

3.2 Port Development

1850 nautical miles from Belen do Pará (Brazil) is located the port of Iquitos which is the Peruvian connection with the Atlantic Ocean.

This port has a modest origin and its foundation is dated in 1861 with the arrival of a Navy Flotilla which established a colony.

The first port was a floating pier interconnected with a barge to shore and was built in 1901. The first enlargement was in 1933 and consisted of the installation of floating pontoons with vasculant bridge connected to shore which permits the transport in wagons and trucks of the merchandise giving more flexibility to port operations. This pier did not have cranes or other heavy equipment which facilitates the movement of the cargo. The stevedores need to transport by shoulder all the cargo from the vessels to the pier, which is very exhausting and uneconomic, considering the high temperature in the zone and the continuous rains. The boom in the oil exploration and the increase of commercial activities in this Region creates the necessity to increase the traffic to the other National Ports, Brazil, and the Atlantic and became the "Project of the Corridor Lima-Amazonia". The government got a loan of US\$ 76,500,000 in 1976 and with this money the ports of Pucalpa - and Yurimaguas were built and the Port of Iquitos was modernized.

In Iquitos the modernization consisted of the addition of a new floating pier with two bridges which entered in service in 1980. In the same way the post area was increased to facilitate the reception operation, warehouses, delivery of cargo, importation, exportation and cabotage. The new pier has the capacity to tolerate the weight of new equip--ment necessary for the maneuvers therefore, the --stevedores only put the cargo in barrows which are picked up by the cranes and transferred to the wagons which transport the cargo to the warehouses.

The new system reduced considerably the use of manpower in cargo handling operations.

This port is the essential key in the region - because it receives all the cargo imported to the regions through the Atlantic. It is then redistributed to the inland ports, similarly all export cargo is collected here and exported to international market, the other situation is -- that this port receives a lot of cabotage cargo (food and general merchandise which represents an important amount of the cargo movement). This port is the conversion point of the cabotage to and from Pucalpa, Yurimaguas. The influence zone of the port of Iquitos includes the regions of - Alto Amazonas, Maynas, Coronel Portillo, Requena, Chahapoyas, Bagua, Ucayali.

The port has a floating pier of 275 meters of -- length and 15 meters width in which ships of 25 foot of draft can moor during the rainy season and cabotage all year. It's interconnected with the port of Pucalpa through the Ucayali River -- (885 Km.) And to the port of Yurimaguas through the Huallaga River (725 Km.)

The door to the Amazonia Region is the port of - Pucalpa in which the Amazonas Corridor begins. It is the center of distribution of goods, principally food and other products of the Amazonia. It's rebate to the commercial and industrial development of the zone. It is interconnected with Lima through the transandina road and longitudinally with the Marginal route of the jungle.

The port of Pucalpa is the interconnection between the land and fluvial transport located along the shore of the Ucayali river in the Province of Coronel Portillo. The capital of the new Department of Ucayali, the Port of Pucalpa is the beginning point of vessel traffic. In recent years all the port activities were developed along artisan lines. All port operations had the direct involvement of manual workers. In terms of port activities that meant more delays and less efficiency. So the government took the decision to build with funds of a loan from the World Bank a new port. This port is finished now and has a floating quay linked with the port with two articulated bridges each of 95 meters length and 6.30 meters width. The quay entered into service on April 24th 1982 and is composed of steel pontoons and permits the mooring of 9 minor vessels in a perimeter of 320 meters of quay of all the commercial movement which originates in the coastal region only 5% has Pucalpa as its destination -- 90% is in transit to Iquitos and another 5% to Yurimaguas. Pucalpa receives the cargo from Iquitos in transit to Lima especially wood. From Yurimaguas, Pucalpa receives mostly rice, maize, and other agriculture products in transit to the coast. The port has facilities and is prepared for the reception and delivery of all the cargo.

The last point of the navigation of Barges and minor vessels in the Huallaga river is the port of Yurimaguas, also built with the World Bank loan. It is located in the Parapapura River 200 meters from the confluence with the Huallaga, inaugurated in August 1981. It has a quay of 61 meters in --

length and 6 meters in width and is connected with the port with a bridge of 33.40 mt. of length and 7.30 mt in width. The port area is prepared with all facilities. This port has contributed - significantly to the development of the agricultural, commercial and other activities which permit the flow of products to Iquitos and Lima using the Huallaga, Marañon, Ucayali and Amazonas Rivers.

In recent years these have been some studies to move the bridge to the Huallaga river which presents more navigable conditions throughout the year.

Now days the condition of the Paranapura make its use inconvenient during the period from July to - November which is part of the dry season.

The influence of the Port of Yurimaguas includes the zones of Alto Amazonas and Part of San Martín Department.

We are in front of a big gap because there are no studies and statistical data about the rivers through time and there is the necessity to start the development of the actual navigation ways and the protection of the ports installations in use and in construction. The Ministry of Transport and Communication has in - execution the "Hidrographic Program" which consists of the execution of Hydraulic Studies of the rivers in the Amazonia, with the purpose of obtaining necessary information to use in improving fluvial navigation and with the principals objectives of:

- Conducting Feasibility studies of navigation in the rivers of the Amazonia, especially in those that constitute ways of communication between the Amazonia Region, Mountain saw, and Coast, giving solutions to the problems of restrictions of navigation.

- Protecting the actual and future port investments -- giving solutions to the problems of the changes of the river courses.

Since 1981 some studies have been conducted, for example, in the Ucayali Rivers in the influence area of the Pucalpa Port. This work has been done by the Hydrographic Service of the Navy. In addition to the ports of Iquitos, Pucalpa and Yurimaguas the government is planning to build 5 miniports in:

- Ayarmunco
- Requena
- Manta
- Contamana
- Atalaya

these projects are now in the Regional Development Committees of Loreto and Ucayali which are in charge in accordance with the decentralization administrative policies of the government.

3.3 General Characteristics of the Ports

3.3.1 Characteristics of the Port of Iquitos General Characteristics

The port of Iquitos is located between

the occidental shore of the Amazonas River 2.8 Km. downbound from the Main Square of the City and in front of Pache Island which is 1.5 Km. offshore and parallel to the shore. This port is part of triangle formed by Iquitos, Yurimaguas and Pucalpa which with complementary roads constitute the corridor of transport from Lima to Amazonas.

Floating Pier

- a) Length of the pier: Enlarged new section 180 mt. Old section 80 mt., total 260 mt.
- b) Width of the pier: enlarged new section 9 mt. Old section 9 mt. total 18 mt.
- c) Built over floating steel, covered by a platform by asphalt and the - old part covered by wood.
- d) Communication to the port is through two mobile bridges which can operate all year round.
- e) Operations are with mobile cranes and wagons to transport the cargo to the warehouses.
- f) It can operate with 2 ocean going ships and three barges at the same time.
- g) The new section started service in 1980.

It is possible for ocean going ships of 12 foot drafts to operate without problems. In this port the river has a current of 4 to 5 knots and the level of the water increases in the rainy season about 33 to 36 feet over the low level.

Warehouses

It has 10 warehouses. The main warehouse that is designated for import cargo is -- 3400 m² and the rest have an average of 400 m² each.

3.3.2 Characteristics of the Port of Pucalpa

The port of Pucalpa is located on the left shore of the Ucayali River in a place called La Hayada.

The main characteristics of the Port are:

- a) The floating pier that has five steel pontoons of 36 mt. x 18 mt. each, connected with each other and thus form the floating pier of 180 mt. length and 18 mt. width. It is covered by a platform of wood.
- b) In the fore of the pier there is a -- building for control of the operation.
- c) The pier is connected to shore by 2 parallel bridges, each one of 145 mt. length. Each bridge has seven sections of 20 mt. each and there are over-floating pontoons. The pontoons sits on the

river bottom in the dry season. The pier's cover is of wood of 6 mt. width and is divided for pedestrians and wagons, but there is the possibility to use the full width of the bridge in case of port congestion. The different level between the rainy season and the dry season in the river is about 8 mt.

- d) The floating pier and the bridges are installed with an anchor system with cables and concrete anchors to the bottom of the river. This permits the mooring of vessels in both sides of the pier. In this manner we have 310 mt. of pier.

The port has another pontoon of 20 mt. length and 6 mt. width, installed independent from the main pier a distance of 30 mt. from it and it is used for passengers.

The installation of the port on shore consists of two warehouses of 5,100 m², two warehouses for merchandise in transit of 4000 m², an administrative building, a customs office, a workshop, and other of an area of 3,170 m². The port has a concrete area of 36,760 m².

The equipment for the manipulation of the cargo includes 8 mobile cranes, 8 tractors, 30 wagons, 10 loaders and other miscellaneous equipment.

The annual loading capacity is 400,000 Tons. The area for traffic and storage place without roof is 36,000 m², warehouses 18,200 m², the removes for the construction were 142,521 m³, volume of concrete used 9,912 m³, steel used for pier and bridges 1,600 Tons. The wood used in platforms 249,161 feet².

3.3.3 Characteristics of the Port of Yurimaguas

The port of Yurimaguas is located on the right shore of the Paranapura River, about 200 mt. - from the confluence of the Huallaga River.

In the construction of the pier the old pier from the port of Iquitos was used. This pier was completely reconditioned in the workshops of the Navy Industrial Service of Iquitos and then moved and installed in Yurimaguas.

The pier has a wood platform of 60 mt. length and 6 mt. width fixed to the steel structure - and supported by 20 steel pontoons.

The connection with the port is through a bridge of 32 mt. and a horizontal section of 17 mt. - - adecuated to the change of the river level -- variable 8 mt. between the different stations.

The pier is installed into position by a system of anchors of steel cables fixed to shore in two points and in the Parana River by four concrete anchors of 15 tons. each.

The pier has special deflector which prevents the accumulation of floating trunks.

This new Port, used for the operations of reception and distribution of the cargo, has warehouses which occupy an area of 2,074 m² and has an administrative building and workshops. There is a concrete floor of 13,000 m² for all operations.

With the finalization of the work the port has mechanized cargo equipment which is appropriate for all the ships sailing in the Huallaga River.

This modern port has a operative capacity estimated in 100,000 Tons. per year and the design allows easy increase in the dimensions of the pier, by increasing the numbers of pontoons and platforms.

- Annual Cargo Capacity	100,000 Tons.
- Concrete Platform	13,100 m ²
- Warehouses	2,074 m ²
- Workshops and Administrative Building	2,100 m ²
- Pier Space Available	84 mt.
- Length and width of Pier	60 x 6 mt.
- Length of the Bridge	33 mt.
- Platform for interconnection	17.9 mt.
- Volume of Concrete Used	3,800 m ³
- Inagurated	February 1981

3.3.4

CHARACTERISTICS OF THE FLUVIATIC PORTS

P O R T	LENGTH FLOATING PIERS	WAREHOUSE AREA	EQUIPMENT FOR MANUPULATE CARGO	DEPTH	CAPACITY PER YEAR
IQUITOS	208 mt.	Cover 7,000 mt ² Open 18,000 mt ²	Tractor 12 Fork lift truck 14 Cranes 10 Wagons 40 Vessels 1 Vehicles 3 Grani band 1	Levels 24 mt. 14 mt.	500,000 Tons. Without the grain band 50 Ton/hour.
PUCALPA	180 mt.	Cover 2 9,100 mt ² Open 2 34,000 mt ²	Tractor 8 Fork lift truck 10 Cranes 8 Wagons 32 Vessels 1 Vehicles 3	Levels 10.5 mt. 2.5 mt.	400,000 Tons.
YURIMAGUAS	61 mt.	Cover 2 2,100 mt ² Open 2 11,000 mt ²	Fork lift truck 2 Vehicles 2 Vessels 1	Levels 8.0 mt. 1.8 mt.	100,000 Tons.

CARGO TRANSPORT IN THE AMAZONIA REGION FROM 1972 - 1984

INCLUDING IMPORT -EXPORT - CABOTAGE (TONS)

YEAR	T O T A L	GENERAL CARGO	LIQUID CARGO	BULK CARGO
1972	285,730	240,380	32,427	12,923
1973	389,600	330,507	49,665	9,428
1974	620,156	478,228	130,239	11,489
1975	945,686	786,575	148,885	10,226
1976	875,460	722,295	141,786	11,379
1977	725,576	579,396	135,489	10,191
1978	704,213	557,978	133,389	12,846
1979	569,319	432,019	125,473	11,827
1980	515,421	414,896	90,238	10,287
1981	447,296	359,502	78,335	9,459
1982	496,236	434,466	51,283	10,487
1983	340,241	291,258	38,747	10,236
1984	363,647	324,657	27,237	11,753

CHAPTER IV

4. The Fluviatic Merchant Fleet

4.1 The Enterprise Philosophy

There are several different types of enterprises formed of fluviatic shipowners. We can find - - Anonymous Society, Society of Limited Responsibility and a Single Ownership Preponderance. That means that have an atomization of little Enterprises which operate in a family form and a lot of them make transport between intermediate towns in the traditional routes: Iquitos - Pucalpa - Iquitos, Pucalpa - Yurimaguas - Pucalpa.

The Enterprises which constitute Societies have the more significant part of the fleet in term of cargo capacity. In the individually owned Enterprises -- sometimes there are people dedicated to agriculture who use their own vessel simply to transport their products to the principal cities and to buy in those places different products for the satisfaction of their own necessities. We can find too, a kind of -- store vessel from which they sell products along the river or exchange agriculture products with the people who live along the shore or in little towns.

The services that the other types of constituted Enterprises offer are to supply the necessary transport from the main Ports in the Amazonia.

They are dedicated to the transport of food, general merchandise, agricultural products, wood, plywood, etc.

There are other Enterprises which are specialized in the transportation of supplies for the oil fields or heavy cargos.

The government has the monopoly on the transportation and distribution of fuel oil, gasoline, nafta, and kerosene. Sometimes the transportation of crude oil is carried by private companies.

In the ports of Iquitos, Pucallpa and Yurimaguas the shipowners are joined in regional associations which are in charge of watchguarding the interest of the associations. The head of these associations meets for instance with the National Agency ORETT to discuss tariff regulations of the transport.

4.2 Vessel Classification

The vessels are classified:

a) Vessels with propulsion:

- Tugs
- Motor Ships
- Motor Boats
- Motor Barge

b) Vessels without Propulsion:

- Flat bottom boat
- Barge
- Albarenga

- The tugs -- are normally of two different types: **One to tow**, used in the wood industry, normally pulls trunks of wood with a long line. The speed is very low, but they are very powerfull and normally little sizes.

To push ahead, used to take other vessels without propulsion, like barges, normally one or two, sometimes more. When a group of vessels consisting of one tug and barges is under way it is -- called "convoy".

To tow alongside, used normally in port operations to move barges from one place to other.

- The motor ship -- is a type of little ship with only one deck and one propeller. It normally has a superstructure from bow to stern. They are normally from 20 to 200 GRT, and used in different type of traffic, there are a lot of them authorized to carry passengers and cargo. They normally have special requirements for that traffic. Some are authorized to tow alongside a vessel called albarena in order to increase their capacity of transporting the cargo. Normally they have a regular schedule between the little towns along the rivers and the main ports.
- The motor boats -- are little boats, normally less than 20 GRT, used by the people dedicated to agriculture, for transporting their products to the main ports and bringing merchandise for their own use. Normally they are single deck or open deck, but covered with special type of covers.
- Motor barges -- have the shape of a barge with a square bow and stern. They have superstructures for accommodation, and pilot bridges on the stern. They can carry cargo on deck or in the hold. They have one or two propellers -- they generally have a little draft and very good maneuverability in shallow waters.

Normally they are working to supply the encampments of the oil fields.

- Flat bottom boats -- are used for liquid cargo and dry cargo. In the case of dry cargo, they normally have a little hatchway on deck and can carry cargo on the hold or on the deck. The design is normally with square bow and stern.
- Barges -- are used for dry cargo, with big hatchways and with square bows and sterns.
- Albarenga -- used to tow alongside motor ships, have a lean bow and round stern, used for carrying dry cargo.

4.3 The Legal Dispositives

The technical aspects of the vessels and the personnel on board is regulated by the Ministry of the Navy through the Direction General of Port Captain and Coast Guard, by means of their Regulations.

The activities of the Maritime Labourers for the trim, stowage and the breaking adrift of the cargo in the port it is controlled by the Commission Control of the Maritime Work, which is a branch of the Ministry of the Navy.

Regarding the activities of the Shipping Enterprises, the control and supervision is under the Ministry of Transport and Communication through the Director General of Aquatic Transport in concordance with the Decree Law No. 17526.

There was no clear policy established by the government to regulate fluvial transportation until the Supreme Decree No. 003-76-TC, dated February 3, 1976.

This Decree outlines some rules for the rationalization and the regulation of the legal situation of the fluviatic enterprises, which were operating at that time.

There are other Decrees for the protection of the fluviatic cabotage but they are reserved only for national vessels.

In 1982 the government promulgated Law 23517 as an incentive for the cabotage on the coasts, lakes, and rivers, allowing the importation of vessels - equipment and floating material free of taxes and in accordance with Law 22202.

Other points of the Law of Cabotage are:

- The facilitation of documents acceptances of the cargo in the ports.
- Facilities of loading and unloading.
- Authorization to charter a ship of other flag in the condition of bareboat.
- The establishment of special tariff for a dry dock and repair services in the Industrial Services of the Navy.
- The exoneration of the taxes to the capitalization and to the exceeding of revaluation of the fixed actives and the patrimony of the enterprise.

4.4 Fluviatic Shipyard

When the first expedition arrived in the Amazonia with orders from the President to create in 1864 - the Capital for the Department of Loreto, the - - first shipyard was created under orders of the Navy. That shipyard has improved through the years and - now constitutes the biggest shipyard in the region.

It was in the year 1972 when the oil boom required a lot of constructions that some new shipyard were opened in Iquitos and Pucallpa.

The number of shipyards jumped from 4 in 1972 to 12 in 1976 in the region, but from that year to 1984 - only 5 were still in operation.

The shipyard in the region not only works in ship-building or ship-repairs, but also uses the installation to support the industry in different activities.

4.5 The Economic Situation of Fleet

Now days nearly 30% of the fluvial fleet is laid up or working temporally. This situation will probably get worst in the near future. If there are no further incentives from the government to support the development of the Amazonic. The question is who can survive? -- The big Enterprise -- which constitute Societies or the individuals owned Enterprises. In this days there is a freight war, and nobody respects the approved tariff. I believe that the more efficient specialized will survive and continue in the business. There are some vessels running with a good success which consist of convoys. They are one tug pushing one or two barges with about 800 metric tons. and can operate with 4 or 5 foot draft all year round without the inconvenience of the river level.

FLUVIATIC FLEET 1984

REGISTER PORT TYPE OF VESSEL	TOTAL			IQUITOS			PUCALPA			YURIMAGUAS		
	No. of Vessels	%	NRT	No. of Vessels	%	NRT	No. of Vessels	%	NRT	No. of Vessels	%	NRT
TUG	182	23.4	310	115	21.7	185	60	28.8	95	7	13.8	30
MOTOR SHIPS	80	10.3	4,363.8	69	12.1	3,350	11	5.3	628.7	6	11.8	385.1
MOTOR BOAT	121	15.6	1,952.8	73	14.1	929.4	35	16.8	810.8	13	15.8	212.6
MOTOR BARGE	47	6.1	5,908.2	27	5.2	3,005.1	15	7.2	2,252.5	5	9.8	650.6
FLAT BOTTOM BOAT	119	15.3	33,904	103	19.9	27,342.6	12	5.8	5,630.8	4	7.8	930.6
BARGE	204	26.3	46,762.6	118	22.8	32,710	72	34.6	10,232.1	14	27.4	3,820.5
ALBARENGA	23	3.0	780.0	18	3.4	654.1	3	1.4	80.7	2	3.9	45.2
TOTAL :	776	100	93,981.4	517	100	68,176.2	208	100	19,730.6	51	100	6,074.6

NOTE : Includes vessels with a capacity of over 10 Tons.

FLUVIATIC FLEET WITH PERMISSION TO OPERATE

D.S. No. 003-76-TC 02.03.76

MINISTRY OF TRANSPORT AND COMMUNICATIONS

DECEMBER 1983

PORTS	IQUITOS			PUCALPA			YURIMAGUAS		
	TYPE OF VESSEL	No.	NRT	No.	NRT	No.	NRT	No.	NRT
TUG	97	170	98	38	52	3	20		
MOTOR SHIP	11	1,124.4	720.8	3	320.6	1	83		
MOTOR BOAT	4	63.4	--	4	63.4	-	--		
MOTOR BARGE	19	1,923.1	1,194	4	540.1	2	189		
FLAT BOTTOM BOAT	38	12,660.6	7,130	16	4,600	4	930.6		
BARGE	126	28,530	20,360	30	6,220	8	1,950		
ALBARENGA	6	258.7	218.7	1	40	-	--		
T O T A L	301	44,730.2	29,721.5	96	11,836.1	18	3,172.6		

- 301 Vessel are the 38.8% of the Fluviatic Fleet
- 44,730.2 NRT are the 47.5% of the total NRT

CHAPTER V

5. Safety in River Navigation

5.1 Difficulties in River Navigation

As described in Chapter II, there are a lot of - variables involved in river navigation and from that we can make a synthesis.

- Knowledge of the river.
- Knowledge of the weather.
- Knowledge of the vessel in the river inter - texture.

As we start with the point of the river, the people involved in navigation are very skillful officers called "pilots", and they know very well the river and have been working for years in this business. If we take an example they know how to recognize the main channels' location and maintain a continuous speed in the route. They normally -- say -- the place is the same, but the river is not the same. There are not buoys or marks along the shores, they know the curve of the river width and sometimes take reference from big trees called -- "Lupuna", which sometimes reach 60 mt.

The echosounder do not help the navigation all the time, because the transducer is continuously damaged by trunks or other submerged objects. It is -- very useful the use of the hand lead.

The pilots normally use their own navigation charts called "Papiros" as a guide and they keep them up to date all the time.

The pilots exchange information and learn quite a lot from the older more experienced pilots. They work like a Clan.

There is another important factor concerned with the current's speed and the maneuver of the vessel, there are points in which you need to vanquish with currents of sometimes 5 knots or more in order to maneuver of the vessel.

There are some rivers during the rainy season which destroy the shore and some trees fall down in the bed of the river and remain like sticks, called "quiruna" -- the problem arises when the level of the water is down, because if you are underway with your vessel this stick can damage the bottom and -- sometimes makes a hole and probably sinks the vessel.

The weather is another of the problems that the mariner needs to take into consideration. As it was shown in earlier chapter, the Amazonia is quite big and there is no weather broadcasting system in operation. The conditions of the zone are not stable change very rapidly -- you can have heavy rain storms or foggy days in which the visibility diminishes to a few meters. In our regulations the us or radars is not compulsory, that is why only a few vessels -- have this equipment.

There is a curious thing in the idiosyncrasy of the people in this region, that they like to change jobs frequently or when they earn good money they stop --

working on the river for a period of time and turn to agriculture, to the raising of cattle or other activities. When they want to get a job or a new vessel they need a certain period of training before they take the job, specially about the maneuverability, stability and other information specific to each vessel.

5.2 Training of Personnel

For many years the crews of the river vessels were people which were trained on board without any -- academic studies.

Promotions were on the basis of time of service and examinations, and those constituted the rules for many years.

In 1976 the government decided to open a subsidiary of our National Merchant Marine Academy in Iquitos in order to prepare Cadets for future service as -- Officers in the Fluviatic Fleet. The studies were three years classroom study and a half year of training on board. The Merchant Marine Academy was open for four years and prepared two classes of Officers in Nautical and Engineering. Thirty Cadets got their Officer Diplomas. In reality some of them got jobs - in different fields and others went to the coast to get jobs in seagoing vessels -- only a few got jobs on board the Fluviatic Fleet. This Academy was closed by determination of the government.

At that time there were some petitions of some fluvia tic officers and ship owners to mantain a training - center which can give short courses for the officers and crew involved in this business, but the decision did not change, because it was uneconomic to run that

type of Academy.

During my time of service in the Harbor Master's Office of Iquitos I could observe the deficiencies in the training of those people, some of them were very good mariners but did not have notions about dangerous goods or idea about stability. The only solution that we could find was to raise the level of the examination and the matters and oblige the officers to improve their knowledge. Also we prepared some information useful for the officer relate to safety on board.

5.3 Casualties in River Navigation

During the period from 1974 - 1978 the casualties on board increased gradually, because of the increase of the fleet and traffic. A lot of crew were needed but many were without good experience. The problem worsened when the government legislated to get all the support available for the oil industry. We were - - forced to allow the approval of officers and crew with men who had insufficient knowledge and experience. -- The fleet cannot stop but the price was significant.

The chart below gives an idea of the number of casualties from 1974 to 1978:

	1974	1975	1976	1977	1978
Sink	4	8	15	13	11
Collision	10	14	11	7	8
Fire on Board	5	8	18	11	10

More recent statistics are incomplete, but it seems that the number of casualties is decreasing again. The reason is that traffic to the oil fields diminished considerably and part of the fleet now is in laid up or working on a basis only.

- In the analysis of the casualties of sinkings, about 75% of them were caused by submerged objects such as trees in the bottom of the bed of the - - rivers, rocks or sometimes other vessels recently sunk or aground. The other 25% were collisions - with other vessels underway, dolphins or quays.
- The result of the investigations show that in the collisions the human factor was the cause of the majority of the casualties - 90%, and the other - 10% were by fault of the equipment or machinery. In the case of the human factor different causes from a wrong calculation during the manouver to an incorrect interpretation of the rules for navigation were to blame.
- The other big problem was fire on board. Sometimes it was too late to determine the cause of the casualty, but according to investigations some probable causes were:
 - The negligence of smokers.
 - The carriage of dangerous goods without taking proper safety measures.
 - The use of kerosene kitchens and lamps.
 - Collisions which led to fire later.

The critical points were in wood vessels because the danger is increased in particular the use of kerosene kitchen.

Those kerosene kitchen can sometimes blowup,
because it has obstructions or other causes, and
in the cases of the lamps when they fall down or
are hit by different elements.

CHAPTER VI

6. Conclusions and Recomendations

6.1 Ports

- a) The development of the ports was a proper policy. However, it was not the right time. It is mention in Chapter Three -- during the decade of the 70s only Iquitos operated as - an active port. Yurimaguas and Pucalpa entered in operation during the 80s.

If we take in consideration the figures of the cargo movement as indicated in page 29, we can concluded that, during the Oil Boom - in Peru from 1973 to 1979 most of the cargo were moved with difficulties, proper of the non existence ports or with difficients ports.

I do believe that this mistake has been taking into consideration with the studies for the construction of 5 new mini-ports as is men- - tion on page 22.

- b) The decision to use the system of pallet as is indicate on page 18 is the first step to the modernization. The second will be probably a containerization.

In the case of the Palletization I recieved information about the flowing of load and - unload in our fluviatic ports. The average mentioned in a period of 4 working hours, - one stevedore group can store 50 metric tons.

If we take information of a seagoing vessel in a coastal port in the same conditions of time, work and stevedores, they can load or unload -- between 120 - 160 metric tons. A result of compare this two situations indicate, that the sea going vessel is in advantage -- 2.5 - 3.2 times more than a fluviatic vessel. Part of this difference between this two types of vessels are the conditions of the ports. In the fluviatic ports the system of tractors and wagons -- which move the cargo from the pier to the warehouse is relatively slow in comparison with the cargo movement in a Coastal Port. The problem get worst when the pier is working full time. It is important to study how to improve the flow of cargo in order to increase the productivity of our fluviatic ports.

- c) If we jump to the second step of the modernization and use containers, we must take in consideration that we recently invest US\$ 76'500,000 in the modernization of one port and the building of two, as is indicated in page 18. This second step will be a very expensive business, because the ports which actually are in use would require a complete change of the port design.

This idea not only involves the port, what about the other elements such as, roads, trucks, vessels?, to get a reference for instance about the roads required, the following specifications are given:

- Width of the cart-way : 3 meters
- Minimum horizontal curve : 30 meters
- Minimum visibility or stop: 25 meters
- Minimum free high : 4 meters
- Sloping : 10%
- Capacity of the road per axle of the truck : 13 Tons.

As is mention in page 4 the Andes divided my country in a longitudinal way, that mean, the transversal roads from the Coast to the Amazonia are very expensive to built, proper of -- the difficult Geography.

Nowadays our roads do not complay with the requirement needed for the implementation of the containerization.

The existing vessels are not prepare for the handling and transport of containerization - mode. To implement this system will require the need for complete remodelation or the possibility to built new with special design.

Nowadays as stated on page 35 the possibility of freight transport and the movement of cargo in the region is very unlike to increase.

Due to low productivity of export products in the country and the decrease of oil activities All this factors have affected the fluviatric - fleet leaving the fleet then with a large amount of over cargo capacity.

The possibility to invest in new specialized vessel is remote.

In the same situation is the road transport.

- d) The Location of the Pucalpa and Yurimaguas are not optimum. During my visit in August 1983, the port of Yurimaguas, located on the Parana-pura River was closed. It was impossible for vessels to moor with 2 feet of water depth. - The floating berth was sitting on the bottom - of the river bed. All the operations of loading and unloading had been done on the shore of the Huallaga River. This situation occurs during a period of four months every year.

The location of the Pucalpa port is not correct because during my visit, part of the berth was sitting on the bottom of the river bed and had six feet depth of water.

There are Hidrographic brigades working about the location of these ports. They are making an investigation if the location of the ports are appropriate or it might be move to other place.

I recieved some information about the investment in the case of Yurimaguas if it is needed to move to other place which is in a distance of 200 meters from the actual location, and the cost will be around 30% of the budget for the initial construction.

In the case of Pucalpa is difficult to get now a preliminary information.

For the future construction of new ports it will be better to have depth studies of the hidrographic characteristics of the area to avoid the mistakes of the ports of Pucalpa and Yurimaguas.

6.2 Fluviatic Fleet

- a) As is mention in Page 35, 30% of the fleet is laid up, but there are not correct records of the amount and type of vessels in this situation. In the nearly future this number will increase a little more. The situation is that the cargo is decreasing as shown in the table on page 29.

There is not good control of the fleet growth, because with the Supreme Decree -- No. 003-76-TC, March 1976, the Director of Acuatic Transport rule the operation of the fluviatic fleet.

If we look the table on page 37 only 38.8% of the fluviatic fleet complay with this - Decree on December 1983.

First it is necessary that all the actual fleet complay with this Decree, and for - future authorizations take in consideration the situation of the fleet, in order to op-
timized the investment of resources.

6.3 The Crew

- a) During the period in which the Merchant Marine Academy was opened in Iquitos as is mentioned in page 48, only a few officers finished their studies. Then it was closed. The majority of the officers -- worked in the area, did not have opportunity of training. We can find that this officers are not well trained in topics - like dangerous goods, pollution control, fire fighting and other specilized topics. It will be interesting if the Merchant -- Marine Academy - Callao can organize courses to complete the knowledge of these -- officers, and as a result get a better -- standard of officars. Other goal will be to reduce part of the casualties indicated on page 41.
- b) Part of the collision/accidents accured on the river, were causad by the men, as is mentioned on page 42, and I found that part of this cases, are wrong interpreta-tion of the navigation rules. There are some aspects not very clear. It will be important to study the actual Rules and implement the adecuate changes.

6.4 The River

Our rivers do not have a proper signal system and aids to navigation, we are still on time

to implement it. It will be advisable to start specially in dangerous areas. In order to run this program, we must have tariff standards which aids to the navigation and signal systems.

6.5 Legislation

- a) Most of the legislation is prepared for the coast and this zone has special characteristics. This means that in the case of the new law of cabotage (Page 34) it was not taken in consideration the situation for example of the shipyards in Amazonia Region. The amount of shipyards decreased from 15 to 5 and with this law the shipowners can import without taxes, different types of vessels.

Our shipyards are not competitive in relation with Brazil, because they have support of the government and give a lot of financial facilities. Our shipyards are not in the same situation. With this condition and the actual situation of the fleet, probably more shipyards will close in the future.

It is time to legislate for this special region and change part of this law for the proper development of the region.

R E F E R E N C E S

1. The Rivers of the Amazonia Guillermo Faura Gaig
2. Geography of Perú Pareja Paz Soldán José
3. Law of Tug, Tow and Pilotage Alex L. Parks J.D.
4. Ship Broking and Chartering Lars Gorton, Arne Sandervärn
5. Manual of Maritime Economic Juan Musso
6. Atlas History and Geographic Instituto Nacional de
of Perú Planificación
7. Censo del Perú -- ano 1980. Instituto Nacional de
 Planifacación
8. Datos Estadísticos Ministerio de Transportes
 y Comunicaciones
9. Datos Estadísticos Dirección General de Capi
 tanías y Guardacostas

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THE AMAZONIA RIVERS AND PORTS

