

Inland Water Transport and Rural Livelihoods

The cases of Iquitos, Mazán and Paraíso in the
Peruvian Amazon River.

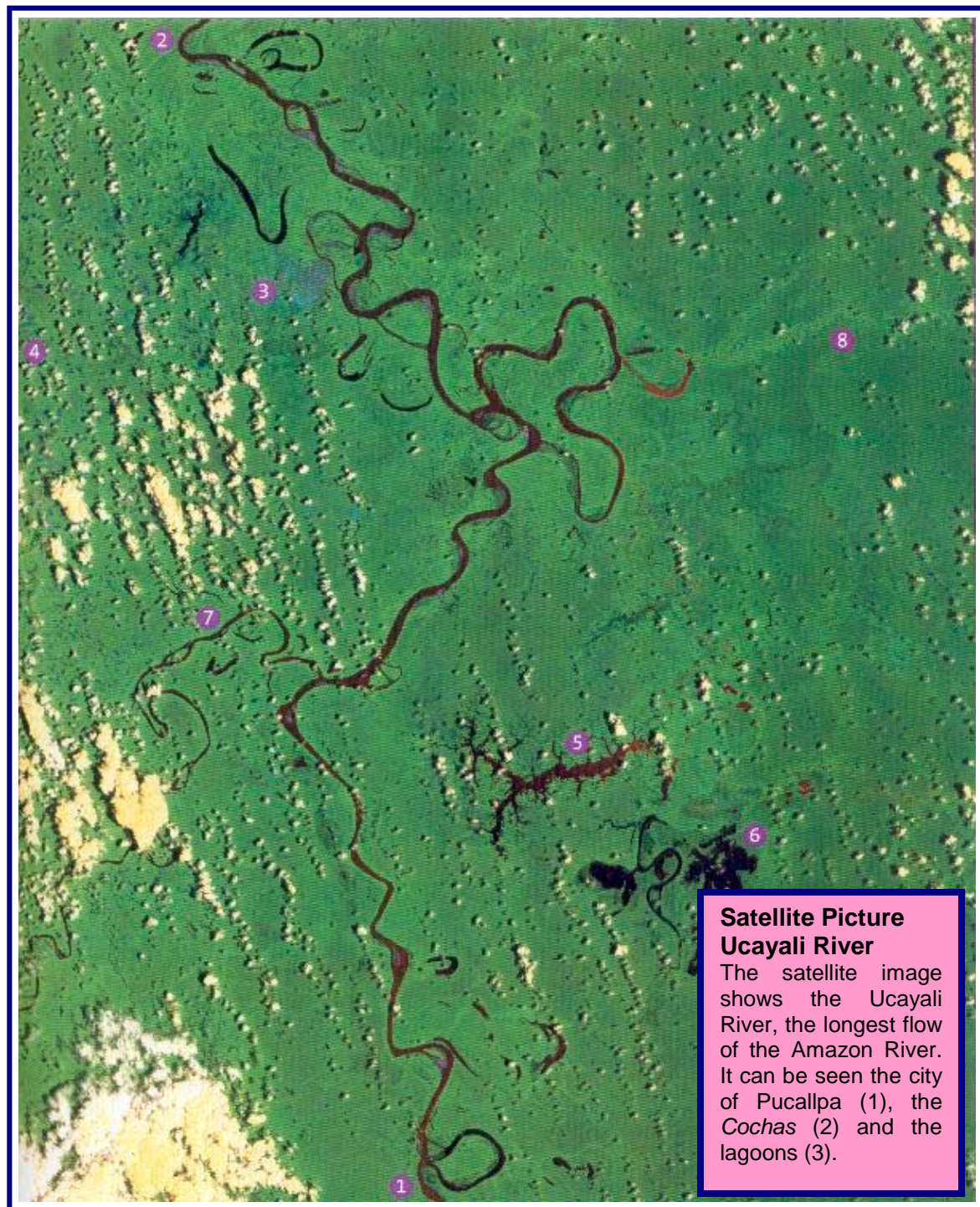
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MAP 1



Source: Great Universal Atlas. El Comercio. Volume 3. Pg. 33

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MAP 2

South America and the Amazon Region



Source: Great Universal Atlas. El Comercio. Volume 2. Pg. 24–25

Executive Summary

1. In general, we can say that the academic analysis and the political concern on the topic of the transportation in Peru are strongly slanted toward the problems of the net of roads in urban and inter-urban areas, and toward the services of transportation among the cities. An almost chronic indifference is noticed and generalized by the problems of the transportation in rural areas. In the case of the river transportation in the Amazon, the public indifference is even bigger, maybe because from the centralist and urban vision of the political leaders of the Capital, the region does not present problems of transportation since "the infrastructure", that is to say the rivers, already exist and they don't require state investments for its conservation; and also because the population and the economy in this territory are not very significant for the cities.
2. Due to the national indifference for the problem of the rural transportation, and particularly for the river transportation in the Amazon, our first intention when carrying out this study is the one of contributing to the knowledge of the situation of the river transportation in rural areas of the Peruvian Amazon, and the one of getting the attention of political, academic and of the international cooperation about the problems and the importance that this mean of transportation has for the life of a forgotten minority in Peru.
3. The initial activities of the study consisted on an exhaustive revision of maps, statistical information and available bibliography on the area, and interviews to officials of the Ministry of Transportation and of the Peruvian Marina in the capital of the Republic in order to gather general information and to identify the corresponding authorities in the study area. On this base interviews were designed for every informant type and a method to classify the information was designed. The field visits included interviews to different informants related to the fluvial navigation in the region.
4. The Amazon River basin represents 60% of the national territory, of which it is considered that 80% is covered with forest and 20% with water. In this region there are more than 9,000 km of navigable rivers and a fluvial fleet estimated in more than 1,000 crafts of more than 30 gross tons, without counting the smallest thousands of crafts like canoes and motorized boats. Due to the geographical, hydrological, demographic,

productive and economic characteristics of the Amazon region, the river transportation is the most predominant and it plays a decisive role in the population's life.

5. The Amazon region is the territory less inhabited of the country (3'419, 000 inhabitants), with approximately 13% of the national population and an average density of 4 inhabitants per square kilometer. The index of fecundity in the region is the highest of the country, with an average of 9,4 children per woman, while the infant mortality average is 99 deaths per each 1,000 children. The official indicators point out that 68.7% of the population lives below the line of poverty and 39.7% below the line of extreme poverty.
6. The regional territory is organized around four main cities (Iquitos is the biggest), located in the shore of the main rivers of the fluvial net, are very distant among them, so each one of them exercise concentrated functions in their respective influence areas: trading, services, government and small manufacturing. The rural population is very dispersed, although it tends to group in small towns along the rivers in the whole Amazon territory. The economy of the families is based fundamentally on fishing and small agriculture of subsistence, with eventual marginal surpluses that they sell in the nearest markets.
7. The river transport management system in the Amazon region is very limited and inefficient basically due to the centralization in decision-making by national government entities, which reduces the capacities of local authorities to implement specific policies and regulations in the region; the dispersion of responsibilities in transport management in several national public institutions, which generates duplicity of functions, inefficiency and lack of coordination; and the traditional problems concerning governmental bureaucracy that result in lack of resources, lack of motivation and corruption.
8. The technological evolution of river transport in the Peruvian Amazon region has not had the same development as the economic and social issues achieved by the region because instead of responding to the needs and capacities of the local population, it has responded to certain opportunities of external technology import such as commercial boom, temporary customs release and oil exploitation. Technological improvements have been induced from outside, thus, nowadays it is possible to find from the most primitive navigation techniques to the most modern and sophisticated vessels.

9. Canoes and rafts impelled by paddles and small wooden or aluminum boats impelled by outboard motors or peque-peques constitute the assemblage of small crafts. In the area, there is a significant number of handmade manufacturers of canoes and wooden boats. The offer of engines and maintenance services is relatively wide in the main cities of the region. The peque-peque engines are the best alternative for the river transportation in small scale, due to the simplicity of its technology, the low costs of acquisition and maintenance, the endurance and durability, and the versatility of uses.
10. Iquitos is considered among the main cities of the country, with an estimated population of 314,419 inhabitants. Besides being the capital of the Department of Loreto, it has administrative and commercial influence on a vast territory. The economy of the city is based fundamentally on the internal and external trade, in the educational services, health, government, security, information, transportation, etc., and in the tourism. The manufactory industry is practically nonexistent.
11. Iquitos is articulated to the rest of the region and the country by air and fluvial transportation, through which it is connected with the ports of Pucallpa and Yurimaguas in order to access to the national net of highways.
12. The port infrastructure of the city of Iquitos is conformed by the Fluvial Terminal of the National Enterprise of Ports, the informal piers of the neighborhood of Punchauca and the port of Belen. The Fluvial Terminal of Iquitos, property of the State, is the only port of the city that has minimum conditions of infrastructure and equipment to operate big ships of load. On the other hand, the piers of the neighborhood of Punchauca and Belen are the ones that support the biggest port activity in the city, However, none of them have the minimum infrastructure conditions to assist the intense flow of passengers and the load that supports. There are neither cranes nor platforms for the shipment and landing, neither appropriate warehouses. It is impossible to calculate the volume of load and passengers that circulates for these piers, because the informality of the activities and the absence of authorities does not allow any type of reliable registration. Stow and distow services of cargo are informal and they are assisted by non-organized individuals and for small contractors for tasks of medium breadth.

13. It is not possible to determine the size of the fluvial fleet that operates in Iquitos, since the official registrations of the Ministry of Transportation are incomplete, and they do not consider the smallest crafts. A notorious characteristic of the fluvial assemblage is its antiquity. In the last decades, the economic recession and the difficulties of market of the regional main export products has have a negative repercussion in the region. Every time there is less load and passengers to transport, and every time the costs of acquisition, operation and maintenance of the ships are higher.
14. The biggest river transportation flow in Iquitos is formed by hundreds of small crafts of private and commercial use that circulate in a radius under 100 km of distance, connecting the city to the towns and rural communities of its environment.
15. The canoes with paddles and the peque-peques are usually used by small farmers and fishermen and by poor urban residents to go to their parcels, to fish, to trade or for simple displacements inside the urban area and their peripheries. On the other hand, the gliders and the boats with outboard engines are usually driven by male operators for transportation of officeholders, for sport and assistance uses. The crafts of commercial use are used by transportation companies that offer loading and trading services and by small companies that lend services of transportation of passengers between the city and the near towns of the area. The owners of these companies usually have several crafts in the marked and they work in a semi-illegal way. Since it does not exist a public organism that regulates the rate of the tickets, it is the offer and demand the one that determines the rates of the transportation.
16. The flow of second level corresponds to the commercial transportation of load and passengers of medium distance, in a radius that varies from 120 km to 220 km of distance. It is a flow mainly composed by crafts of 160 tons approximately, locally called "motor ships" or "boats" that use diesel motors of 200HP of power and more, and they can transport simultaneously a great quantity of passengers and of load.
17. Each owner possesses several of these crafts that operate indirectly through hiring contracts. In order to gather the money, this one must make the biggest number of

possible trips with the biggest quantity of load and passengers. The results are that the conditions of the trips are really deplorable. There is a strong competition among the crafts of medium range, and the rates of the tickets can vary substantially according to the seasonal demand and the quality of the services offered. The users of these public transportation services are men, women and children, whose trips to the city are related with the trading, with the rendering of public services and the specialized services of health, and many for family or personal reasons.

18. The flow of the third level corresponds to the heavy transportation for load crafts of up to 8,000 tons, and they circulate in a radius of 600 km to 1,000 km of distance to the intermodales ports of Pucallpa and Yurimaguas. The assemblage of ships is formed by a variety like tugboats and pusher boats, cargo ship carriers, tankers, load and passengers motor ships. Those of heavy load usually use the Fluvial Terminal of ENAPU or the facilities of the national enterprise of petroleum, while the passenger are the same that operate in the second distance ratio and that use the piers of Punchauca.
19. The offer of new crafts in Iquitos it is reduced to the canoes and wooden boats built by local specialized carpenters, and aluminum boats, built by order in the shipyard of the Estate. In the city of Iquitos there is a dozen of commercial institutions specialized in the sale of engines and spare parts. All the spare parts of engines are import from abroad. The only exceptions are the propellers of "long tail" engines, since it is a local technological adaptation; and in smaller measure the *connecting rods* that are manufactured by 3 or 4 small handmade foundries of Iquitos and Pucallpa. In the city of Iquitos, and particularly in the port of Belen, great number of mechanics that offer all type of services of diverse repair quality and maintenance of engines exist.
20. Mazán is a rural town in the area of influence of Iquitos. The main economic activities of the area are the agriculture, the wood extraction, the fishing and the hunting. The town has several schools, a small center of health and dependencies of the police and the local government. The official indicators point out that 74% of the population lives in poverty conditions and 44% under conditions of extreme poverty.

21. The town is strategically located in the proximities of the confluence of the Napo River with the Amazon River, in a place where they come considerably close to each other. In this sector there is an asphalted sidewalk that crosses the narrow land portion that divides them, allowing this way to shorten the time of trip considerably between Mazán and Iquitos. This has allowed Mazán to become the center of the commercial mediation between the riverside rural communities of the Napo River and the city of Iquitos. Mazán has a fluvial pier under the responsibility of the local Municipality and designed to assist ships of up to 60 tons of loading capacity and for a movement of up to 50,000 tons a year.

22. Paraiso is a small rural settlement inhabited for 250 families with average revenue of \$40 per month, located on the shore of the Napo River and at a little distance of Mazán. The economy is based on the small agriculture, the fishing and the selective wood extraction. The town has a small primary school assisted by two teachers and a service for first aids in charge of two trained neighbors and supervised by the Ministry of Health's personal.

23. The access to Paraiso is made exclusively by fluvial way. A small net of pedestrian paths that go into the forest also exists, used by men, women and children to go to the farms to bring firewood, wood and the harvest, and for hunting. The town doesn't have any port infrastructure.

24. The men of both towns, and possibly women, use boats and canoes for fishing tasks, to move to the agricultural parcels, to transport their products to the community and the port of Mazán, and to access to the area that are far away to do the hunting and wood extractions. In the other hand, women use the canoes one or twice per week to look for firewood, to help the men in the fishing tasks or to go to Mazán in search of services. The students of the high school in Mazán use the canoes to cross the river at least twice a day. In general, people consider that the transportation in small scale does not constitute an important limitation for their economic and social activities, because their productive structures are not guided to the generation of more commercial surpluses, and because their ways of life are isolated and self-sufficient.

25. A first type of demand for the river transportation toward the exterior of the area of study is constituted by the necessity of all the people that live along the Napo River of moving

from and toward the city of Iquitos. The main reasons of the trips are in connection with the sale and the supply with the access to specialized social services. Other reasons of smaller frequency have to do with the employment search, with the execution of official procedures (particularly in the case of the authorities), with the visits to family and friends and, in the case of the personnel of the ministries and state dependencies, to get their paychecks. Although the merchants of the area that circulate between Iquitos and the riverside communities of the Napo River, buying agricultural products and fish, and selling manufactured products that they bring from the city.

26. In Mazán a considerable quantity of private crafts exists. Most of them are canoes impelled by paddle, although there are also boats with engines, *pequepeque* and outboard used mostly by the wooden extractors to mobilize their personnel. On the other hand, Paraiso does not count with motorized crafts.
27. The commercial services of river transportation that operate in Mazán differ according to the destination of the trip. The short transfers toward closer towns are done in small boats, possibly canoes, impelled with *peque-peque* engines. The transfers of medium and long distance for the Napo River are done in medium crafts, with outboard motors. Lastly, the transfers toward the city of Iquitos by the Amazon River are carried out in slides or in impelled wooden boats with outboard motors. These crafts that give services of transportation of light load and passengers, operate from the city of Iquitos to diverse far away destinations, so Mazán constitutes an station in their journeys. A considerable quantity of public transportation crafts that go by this point exist, so the flow is constant and the time of wait is relatively short.
28. In Mazán and Paraiso there are several people with experience in the production of boats and canoes and repair engines. Although, commercial stores dedicated to the sale of engines do not exist. On the other hand, it is possible to acquire some basic spare parts for *peque-peque* engines, like propellers, connecting rods and spark plugs, as well as fuel and oils.

A. Introduction

Peru is located to the west of South America between the Pacific Ocean and the Amazon forest. The country has an extension of 1'285,216 km² and an estimated population for the year 2002 of 26 million people, of which about 25% live in rural areas.

Geographically, Peru is divided in three big natural regions. To the west, on the Pacific Ocean, a narrow coastal strip of more than 2,000 km of length, constituted by a deserted territory and crossed by seasonal rivers that descend violently from the Andes Mountains, creating valleys and oasis where the main cities of the country are located, among them Lima, the Capital of the Republic of Peru. In this region more than 60% of the national population is concentrated, with a density of more than 100 inhabitants per km and, more than 90% of the industry and of the modern agriculture for exportation.

Toward the east, and parallel to the coastal strip, the Andes Mountain is extended crossing the country in the north - south axis, with mountain mass over 6,000 meters of height and inter-Andean valleys favorable to the agriculture and the human settlements. In the snowy heights of these mountains most of the Peruvian rivers are originated, that flow towards the west to the Pacific Ocean or to the east looking for the low territories of the Amazon. In this region 30% of the national population lives, with an economy mainly based in the small agriculture and the great mining. Finally, to the east of the country the enormous Amazon territory is extended, created by immense plains covered with tropical forests and crossed by an extensive fluvial net that feed the waters of the Amazon River. This region occupies 57.6% of the surface of the country and it harbors less than 11% of the population. The economy is based on the urban trading and in the extraction of petroleum and fine woods, although most of the rural population survives from a small agriculture of self-consumption.

The aquatic transportation in Peru is carried out in the three regions: in the maritime littoral, where the bigger and equipped ports of the country are, assisting the international trading and the important fishing industry. In the Titicaca Lake, located in an Andean plateau between Peru and Bolivia at more than 4,000 meters on the sea level, the aquatic transportation is used by the small indigenous populations that inhabit its islands and by tourist crafts. And in the

Amazonian rivers the fluvial sailing constitutes mainly the only mean of transportation available to the majorities.

In general, we can say that the academic analysis and the political concern on the topic of the transportation in Peru are strongly slanted toward the problems of the net of roads in urban and inter-urban areas, and toward the services of transportation among the cities. Possibly this is explained by the urbanization grade reached by the Peruvian population, but in any event, an almost chronic indifference is noticed and generalized by the problems of the transportation in rural areas.

In the case of the river transportation in the Amazon, the public indifference is even bigger, maybe because from the centralist and urban vision of the political leaders of the Capital, the region does not present problems of transportation since "the infrastructure", that is to say the rivers, already exist and they don't require state investments for its conservation; and also because the population and the economy in this territory are not very significant for the cities.

B. Purpose of the Study

Due to the national indifference for the problem of the rural transportation, and particularly for the river transportation in the Amazon, expressed by a dramatic absence of studies and proposals to improve the systems of local transportation, our first intention when carrying out this study is the one of contributing to the knowledge of the situation of the river transportation in rural areas of the Peruvian Amazon, and the one of getting the attention of political, academic and of the international cooperation about the problems and the importance that this mean of transportation has for the life of a forgotten minority in Peru.

In the first part of the work we present a characterization of the Amazon region, trying to determine the role and the importance that fluvial transportation has to the urban and rural population.

In the second part we make a description of the system of administration of the river transportation in the Amazon region, trying to describe the role of the main public actors that intervene in the administration and to identify the most outstanding problems that affect the sector. However, to have a wider vision of the state of this matter, it would be necessary to

enlarge the study to the non public actors that also participate in the system, like the big ship owners that own numerous fleets of great tonnage, the companies of tourism, the oil companies, the formal and informal lumbermen, the shipping companies of foreign commerce, etc.

In the third part we make a study of the intermediate means of water transport that exist in the region, from a perspective of the technological evolution and of the main characteristics of the crafts and propellers.

Lastly, we present two case studies, one in urban area and the other one in rural area, analyzing the characteristics of the offer and the demand of the river transportation services in different contexts.

Finally, we want to reiterate that, since the incipient development of the knowledge that exists on this topic in Peru, our work has a more descriptive character than a proposal would have, and it is oriented to know the state of the situation before to formulate alternatives of action. For that, we believe that it is still necessary to carry out bigger thoroughly studies, to be able to identify the problems whose solutions depend on actions in transportation, from those ones that result of structural factors of the Peruvian society.

C. Methodology

In the first place, it is important to point out that the study area is very distant of the place where this report was organized and edited (1 ½ hrs by plane), so we could only make one visit to the region, since the transfer costs and internal movements were too high for the available budget.

The initial activities of the study consisted on an exhaustive revision of maps, statistical information and available bibliography on the area, regrettably there was not much information referred to the aspects of the fluvial transportation. Parallel, we interview officials of the Ministry of Transportation and of the Peruvian Marina in the capital of the Republic in order to gather general information and to identify the corresponding authorities in the study area.

This initial phase was of great help to define the preliminary structure of the study, to specify the key topics of the investigation and to identify the type of information that we should gather. On this base interviews were designed for every informant type and a method to classify the information was designed. Due to the prolonged permanency limitations in the area, it was necessary to hire an investigator assistant resident in the city of Iquitos. The participation of this person was key in the work, because he helped to select the areas for the case studies, he gathered detailed information with patience and thoroughness; he organized the field visits and contacted the key informants.

The field visit was divided in two parts. Initially in the city of Iquitos, where we carry out interviews to different informants, we visit the ports, we board several crafts and we adjust the information previously gathered by the assistant. The second part was carried out in the rural towns selected for the case studies, where we also interview officeholders, owners and manufacturers of crafts, mechanics, passengers and people that lend public transportation services. Finally, we visit some houses where we interview the families about their ways of life and their relationship with the river transportation.

MAP 3



Source: Great Universal Atlas. El Comercio. Volume 3. Pg. 26

D. The Amazon context

1. The natural means

1.1. General characteristics of the Peruvian Amazon Region

The Amazon Rain Forest, located in South America, is the most extensive area of tropical forests in the planet and it harbors the biggest diversity of biological species. Its extension is not defined with accuracy, although the most accepted figure is of 6'400, 000 km².

According to the Amazon Cooperation Treaty, this territory is shared by 8 countries, of which Brazil has 64%, Peru 16%, Bolivia 12% and Colombia 8%, while Ecuador, Venezuela, Guyana and Suriname have very reduced proportions¹.

In Peru, the official figures indicate that the Amazon River basin represents 57.6% (739,672 km²) of the national territory, of which it is considered that 80% is covered with forest and 20% with water. In this territory there are distinguished two natural regions: the *High Forest*, located in the eastern foothills of the Andes between 400 and 3,800 meters above sea level, and the *Low Forest*, in the Amazon plain between 80 and 400 meters above sea level.

The *High Forest* is characterized by its accidented relief, formed of mountains covered of forest and extensive valleys that are very appropriate for the agriculture, the cattle raising and the human settlement. In this natural region the natural resources are subjected to a strong pressure of use, giving place to an extensive managed area of selective forest exploitation, to a small migratory agriculture and to an extensive cattle raising of low productivity. The destruction and the wrong use of the land is producing serious damages in the system of the rivers and in the immediate valleys, originating climatic changes, sliding of hills and fauna loss.

The *Low Forest* presents a landscape of low hills and extensive plane alluvial areas. The plains and the rivers are closely tied by the pluvial system. The overflow of the rivers and the interactive flood of extensive land portions create particular conditions on people's

¹ CERUTI D'ONOFRIO, Fiorella. 1997.

life, and on the flora and fauna. The populations located in these territories have been able to adapt their productive activities of subsistence to these conditions determined by the perennial cycles of overflow and decrease.

1.2. The hydrological system

Rivers, lagoons and swamps constitute the hydrological system of the Peruvian Amazon.

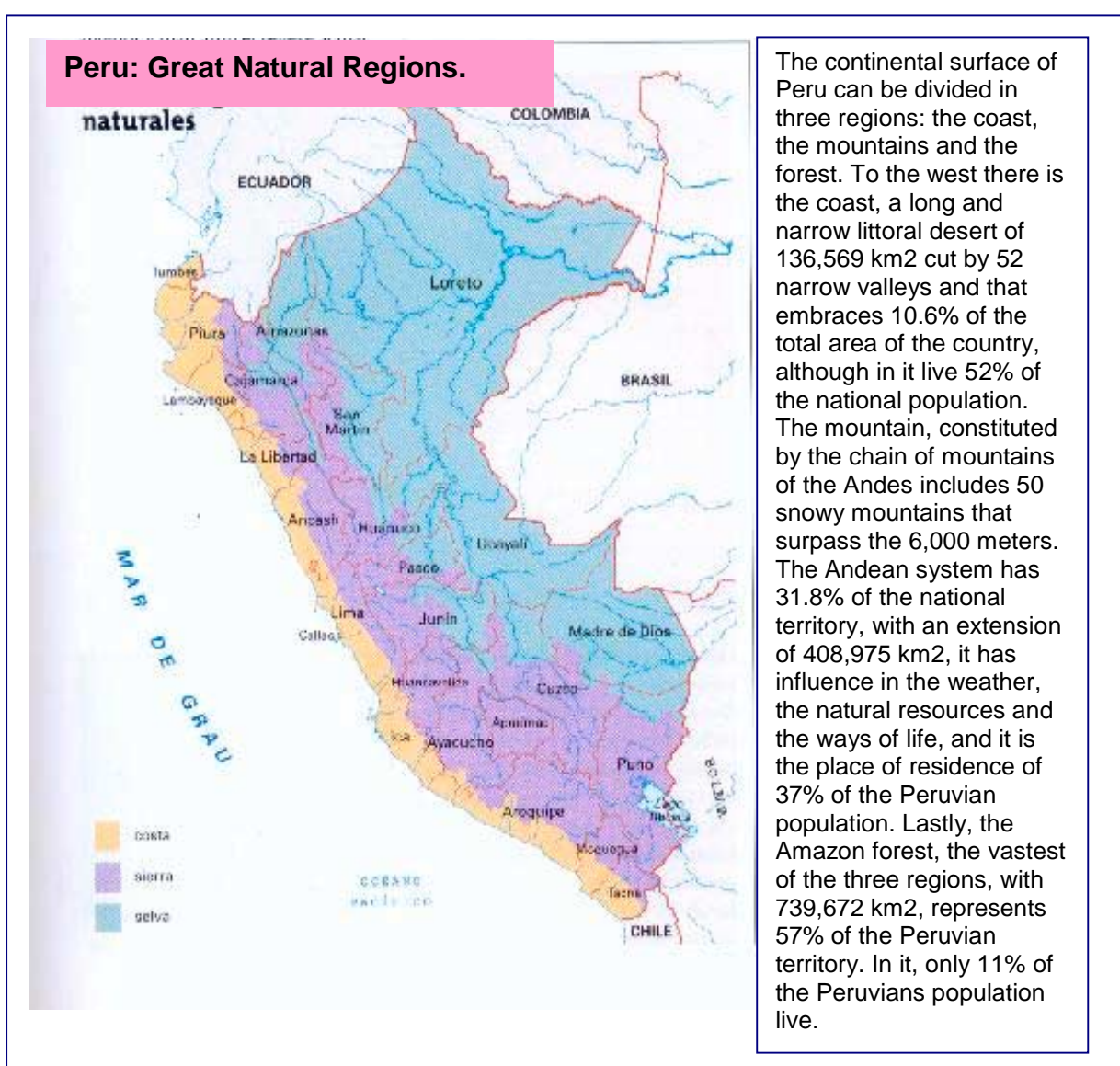
Most of the rivers are born in the snowy high summits of the Andes and flow to the forest plain, feeding the waters of the three main rivers in the Peruvian territory: the Marañón, the Ucayali and the Madre de Dios. The confluence of the first two, in the proximity of the city of Iquitos, gives origin to the Amazon River, and the third one goes into the Brazilian territory with the name of Madeira River until it ends at the main river. The longitude of the Peruvian tract of the Amazon River from its origin to the border with Brazil is 620 Km. In its journey on the Peruvian territory its width varies from 2,000 to 5,000 m. and its depth varies from 10 to 30 feet.

These big rivers are characterized to be of long journey and great flow. In general, they have three clearly differentiated sectors: the *superior course*, the *half course* and the *low course*. In the *superior course*, the flow descends from the high mountains; it crosses the Andean plateaus and goes through narrow and deep gulches in the eastern flank of the mountain range. In this sector, the slopes are very marked and the channel of the rivers is covered for big rocks, which disables its sailing. The deep canyons arrive to their end when the flow penetrates into the area of the high forest, which is the beginning of the *half courses* of the rivers.

The *half courses* are characterized by the decrease of the slope and for the formation of wide alluvial valleys very appropriated to the agriculture and the human settlements. At the end of this sector, the rivers meet with the last Andean buttresses that cross for narrow gulches where the flow carries a lot of water again. In this sector, the fluvial sailing is possible in certain tracts, although in the last decades this practice has been disappearing as consequence of the construction of roads and means of communication.

The *low course* begins when the flow penetrates in the Amazon plain. The rivers get wider and the channels appear covered of sand. When the waters get off level, they uncover beaches and islands of sand with abundant limes. Since the lack of slope and the absence of topographical accidents, the rivers spread to be serpentine, changing course in every seasonal period and making difficult for the population to establish permanently on the riversides. The bends that the river abandons when changes its course, originate the formation of lagoons or *cochas*, eventually connected to the rivers by narrow pipes. In flood seasons, the current of these pipes flows toward the lagoons, changing direction in periods of decrease, allowing the drainage of the waters of the lagoons toward the rivers².

MAP 4



Source: Great Universal Atlas. El Comercio. Volume 3. Pg. 35

² *Atlas del Perú*. DURAND, Eduardo. 1992.

1.3. Sailing in the rivers of the Peruvian Amazon

It is considered that in the Peruvian Amazon an extensive net of navigable rivers of 9,000 km of longitude exists. The Peruvian Directorate of Hydrography and Navigation considers navigable the courses of water that admit crafts from 2 feet of draught. This means that the sailing is possible starting from the half course of the rivers, in the High Forest region.

In this sector the flow is increased and it diminishes the speed of the waters, creating big eddies interrupted by strong rapids that limit the flowing sailing and the use of crafts of medium draught. Rafts from 4 to 6 tons and motorized boats of up to 15 tons are usually used for transfers of short distance or to cross the bed of the rivers. However, this practice is disappearing gradually as it grows the net of highways and bridges.

In the low course of the rivers, the sailing for crafts of until 1,000 tons is possible during the whole year, and their capacity can be increased according to the season and of the proximity to the bed of the Amazon River. In this one, sailing is possible with crafts of transoceanic reach³.

2. Population, space distribution and organization of the aquatic transportation

In spite of their enormous extension and of the wealth of their natural resources, the Amazon region is the territory less inhabited of the country (3'419, 000 inhabitants in 2002), with approximately 13% of the national population and an average density of 4 inhabitants per square kilometer. However, in the last years, the region has registered a considerable demographic growth (5.4% per year), particularly in the urban areas.

³ *Atlas del Perú.*

Distribution of population by natural regions and place of residence		
	Total	%
National	25'662,000	100
Coast	13'368,000	52.09
Andes	8'875,000	34.58
Amazon	3'419,000	13.32

Source: Compendio de estadísticas sociodemográficas 1999 – 2000. Instituto Nacional de Estadística e Informática. Lima, Perú. 2001.

The index of fecundity in the region is the highest of the country, with an average of 9,4 children per woman (3,0 national average), while the infant mortality average is 99 deaths per each 1,000 children (45/1,000 national average).

In terms of poverty, although the indexes of the amazon region are quite high (68.7% of the population under the line of poverty and 39.7% in extreme poverty), they are smaller than those of the Andean region⁴.

Demographic rate of growth per natural regions and urban areas						
	1961 - 1972		1972 - 1981		1981 - 1993	
	Total	Urban	Total	Urban	Total	Urban
National	2.9	5.0	2.6	3.7	2.4	3.5
Coast	4.8	5.6	3.2	3.8	2.7	3.6
Andes	1.5	3.8	1.7	2.5	1.3	3.3
Amazon	0.6	4.2	3.3	6.2	5.4	3.4

Source: Compendio de estadísticas sociodemográficas 1999 – 2000. Instituto Nacional de Estadística e Informática. Lima, Perú. 2001.

⁴ In Peru, 54.8% of the national population lives below the line of poverty and 24.4% below the extreme poverty. The index of poverty is measured according to the cost of the basic basket of consumption (\$74 in Lima and \$42 in the rural Amazon), and the extreme poverty in terms of the cost of the basic basket of aliments (\$34 in Lima and \$27 in the rural Amazon). These costs vary according to the socio-economic characteristics of the regions.

Poverty conditions of the Peruvian population 2001		
(On percentages)		
Geographical Areas.	Poverty	Extreme poverty
National	54.8	24.4
Urban Area	42.0	9.9
Rural Area	78.4	51.3
Coast	39.3	5.8
Andes	72.0	45.6
Amazon	68.7	39.7
Amazon urban area (Iquitos)	62.4	34.9
Amazon rural area (Mazán & Paraíso)	74.0	43.7
Lima Metropolitana	31.9	2.3

Source: Encuesta Nacional de Hogares sobre condiciones de vida y pobreza. Instituto Nacional de Estadística e Informática. Lima. Perú. 2001.

The ethnic diversity is one of the Peruvian population main characteristics. In the country there are towns of Native, European, African and Asian origin that cohabit, and the Spanish language is used as the basic language of communication. With the time, these have fused in diverse crossing of races that are distributed in the whole national territory.

Main Peruvian languages	
80%	Spanish
18%	Quechua
1%	Aymara
1%	Other native languages

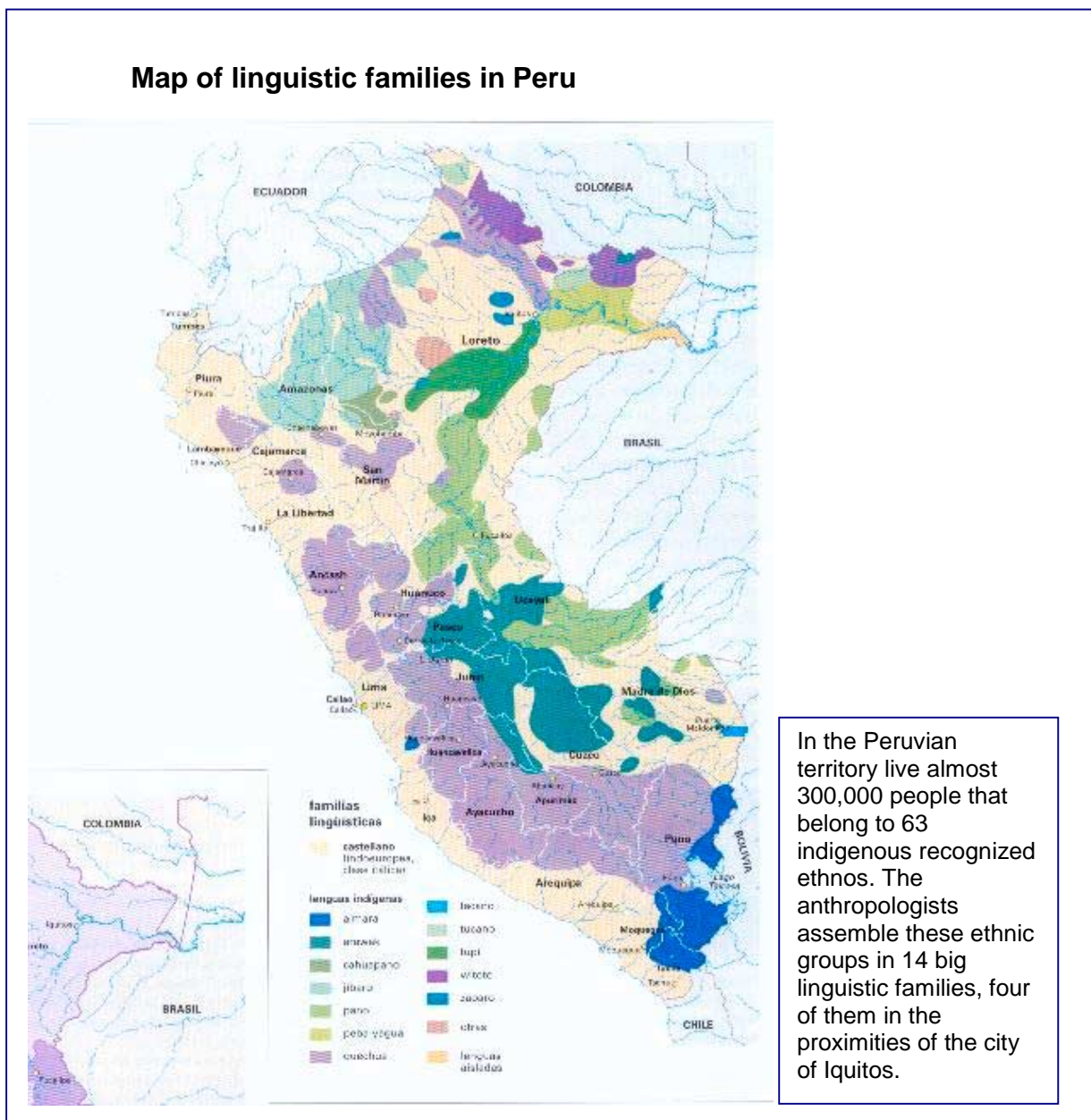
Source: *Gran Atlas Universal*. Empresa editora El Comercio. Lima, Perú. 2002.

In the amazon region, most of the population is cross-raced, that is to say product of diverse races, although around 300,000 people (less than 10% of the regional population) are mainly from a native origin, and they are organized in 63 different ethnos and distributed in 1,458 recognized communities. The anthropologists have registered 40 native languages in the amazon region, which are classified in 14 big linguistic families⁵.

⁵ EDITORIAL SOL 90. *Gran Atlas Universal*. 2002.

MAP 5

Map of linguistic families in Peru



In the Peruvian territory live almost 300,000 people that belong to 63 indigenous recognized ethnoses. The anthropologists assemble these ethnic groups in 14 big linguistic families, four of them in the proximities of the city of Iquitos.

Source: Great Universal Atlas. El Comercio. Volume 3. Pg. 53

In the Low Forest, the main cities are Iquitos (274,759 inhabitants in 1993), Pucallpa (172,286 inhabitants), Yurimaguas (30,658 inhabitants) and Puerto Maldonado (31,249 inhabitants). These four cities, located in the shore of the main rivers of the fluvial net, are very distant among them, so each one of them exercise concentrated functions in their respective influence areas: trading, services, government and small manufacturing.

Iquitos, in spite of being the biggest and developed in the Peruvian Amazon, is far away from all, and it is located in the heart of the forest in the shores of the Amazon River. The only way of access is by air, mainly from the capital of the country (1 ½ hrs flight). By fluvial way, it is articulated by the cities of Pucallpa and Yurimaguas (36 at 40 hrs. trip), both in the shore of main rivers and connected to the national net of highways. Through the Amazon River, it also connects with Brazil and the Atlantic Ocean. On the other hand, Puerto Maldonado, in the shore of Madre de Dios River, is disconnected from the fluvial net of the region, so it is articulated to the rest of the country by air and highway.

On the other hand, the rural population is very dispersed, although due to the conditions of the natural means, it tends to group in small towns along the rivers in the whole Amazon territory. Due to the levels of poverty and the isolated conditions that they live with: the economy of the families is based fundamentally on fishing and small agriculture of subsistence (banana, cassava and rice), with eventual marginal surpluses that they sell in the nearest markets or they exchange for manufactured products with merchants that transit through the rivers. As consequence, the monetary economy is very reduced, which has considerable effects to the development of the fluvial transportation.

The districts capitals, or eventually the towns strategically located in the confluence of the rivers, concentrate the main education services, health and government in their influence areas and they play mediation roles between the cash economy and the exchange economy, articulating the rural world with the urban one.

This scenario, constituted by concentrated urban poles, intermediate towns and hundreds of small rural villages dispersed in a vast territory connected by a gigantic fluvial net, determines the organization of the aquatic transportation.

In the first level there are the big crafts for cargo and passengers of more than 300 tons, that circulate in a radius of 600 km to 1,000 km of distance, between Iquitos and the ports of Pucallpa and Yurimaguas, as well as with the border with Brazil and the oil area to the northeast of the region. The second level is constituted by crafts for passengers and cargo of smaller size (160 tons in average) that circulate around the main cities of the region, in radios of up to 200 km of distance. The third level is constituted by the light transportation of cargo

and passengers, in motorized crafts of up to 12 tons and in radios of up to 100 km of distance. This level works around the main cities as well as around the intermediate towns that articulate the rural world. Last, there are the smallest crafts, canoes and *peque-peques* that are used by the population to go to places within to 50 km of distance⁶.

E. River Transport Management System in the Amazon Region

The river transport management system in the Amazon region is very limited and inefficient basically due to (i) the centralization in decision-making by national government entities, which reduces the capacities of local authorities to implement specific policies and regulations in the region; (ii) the dispersion of responsibilities in transport management in several national public institutions, which generates duplicity of functions, inefficiency and lack of coordination; and (iii) the traditional problems concerning governmental bureaucracy that result in lack of resources, lack of motivation and corruption.

The two main public institutions with direct responsibility on river transport management in the Iquitos region are the Executive Direction of Aquatic Transport, an institution that depends on the Transport Ministry and is responsible for the formulation of policies and regulations on aquatic transport nationally; and the Harbour Master's Office, an institution that depends on the Army and ensures that all the regulations are fulfilled. There also other public entities with some degree of participation in river transport management such as the National Harbour Enterprise (ENAPU), the municipalities and the local offices of the Agriculture, Fishing and Energy Ministries.

1. The Executive Direction of Aquatic Transport

The Executive Direction of Aquatic Transport of Loreto is a line-organ of the Transport Ministry. Its main responsibility in the region is to propose and execute the politic decisions and regulations on aquatic transport adopted by the high direction of the Transport Ministry. Such decisions and regulations are usually applied homogeneously throughout the country. Consequently, there is not an specific regulatory framework for river transport in the Amazon region. Due to the centralization in decision-making, such policies and regulations tend to

⁶ DURAND, Eduardo. 1992

focus on controlling large tonnage commercial cargo transport carried out mainly at sea harbours in the country.

From this information we can conclude first that the high government levels in the country do not value the role that river transport plays in the social and economic life of Amazonian populations; second, that aquatic transport is an issue of interest only as long as it generates income from large-scale trade; and third, that the prevailing transport notion at high government levels is related basically to land transport, particularly road infrastructure. From this standpoint, we can say that river transport is not an issue the Peruvian Government worries about since neither it does require large investment for infrastructure, nor it generates important resources for the country.

In this context, the role that the Executive Direction of Aquatic Transport of Iquitos plays is simply to issue annual operation licenses for river transport enterprises and intermediary agencies, as well as operation and chartering licenses for vessels with over 30 tons of gross tonnage, that is, only for vessels that render large-scale commercial cargo and passenger transport services. Smaller vessels that do not fall into this range, many of which also render small-scale commercial transport services, are not subject to control by this institution.

Unfortunately, the lack of interest toward this type of transport, the lack of economic resources and the inefficiency of the officials has resulted in much corruption when issuing licenses and permissions. According to the official responsible at this office, over 50% of the vessels with more than 30 tons operating in the region do not have the corresponding license or permission because they do not meet the requirements set by the regulations. However, the Ship owners' Association of Iquitos, which groups the main owners of large vessels, says that often they cannot obtain the licenses because they refuse to make the illegal payments asked by corrupt officials.

As regards to its responsibilities in harbour infrastructure, there is even more inactivity –only in the city of Iquitos there are over 50 docks and wharves operating illegally without the supervision of the Transport Ministry. Most of these illegal docks and wharves do not meet the minimum infrastructure requirements to serve the demand. The management of such

docks and wharves, particularly in rural areas, is often assumed by the municipalities or by the owners themselves, who apply their own operation rules.

License and Permission Fees established by the Transport Ministry	
Annual operation record and permission for river transport enterprises per operation route	S/. 652 (US \$186.30)
Operation license per river transport vessel	S/. 260 (US \$74.30)

2. The Harbour Master's Office of Iquitos

Harbour master's offices are entities that belong to the General Direction of Harbour Master's Offices and Coast Guards of the Navy of Peru. They are found alongside the seashore, in the Titicaca Lake and in the Amazonian rivers. There are four harbour master's offices in the Amazon region, including the Harbour Master's Office of Iquitos. Its main responsibility is to control the fulfilment of the rules and regulations concerning river activities, as well as safety rules in all the vessels that navigate on Amazonian rivers. Skippers and captains of all motor vessels starting their journeys from the main harbours in the region must ask for a departure authorization ("permission to weigh anchor") to be issued. This permission is issued after making a record of the crew and the passengers, and verification of safety rules.

Unfortunately, as with the local office of the Transport Ministry, these functions are not fully fulfilled due to various reasons, e.g. the lack of economic, human and technical resources, and a widely-spread attitude in governmental bureaucracy that chooses to "let it be" in order to "avoid problems," which inevitably results in corruption. Most interviewees said that safety control to vessels is practically non-existent and that departure permissions are obtained by making illegal payments asked by the officials. These illegal payments vary according to the type of vessel and cargo, and the background of the person who asks for it.

Despite these irregularities, several interviewees said that accidents in river transport are few in comparison to the intensive use of this transport mode. According to the Harbour Master's Office of Iquitos, only 11 deaths have resulted from river transport accidents during the last

two years; all these deaths were produced by individual neglect at harbours. However, this figure is very likely to be inexact since there is not a rigorous record of accidents. Most accidents occur in remote rural areas often as a result of canoes turning upside down. In spite of this, the issues related to accidents and safety does not seem to be critical points in river transport in the region.

3. The National Harbour Enterprise (ENAPU)

The National Harbour Enterprise is also an institution that belongs to the Transport Ministry. Its main responsibility is to manage, operate and maintain the main harbour terminals in the country. In the Amazon region it manages four river terminals, including the one in Iquitos, which serves basically medium and large-draft cargo vessels. Three services are provided – dock rent to bring vessels alongside including electric supply, drinking water and drainage for vessels; loading and unloading cargo services; and storing merchandise. Fees fixed by the Transport Ministry are collected.

The river terminal of Iquitos is the most important one in the region because of its size and demand –it is the only one with capacity to serve large sea-going vessels of up to 25 feet of draft only during swelling periods. It has a floating dock that is 187 m long and 15 m wide with a minimum 56 feet tie rod in low waters; 10,500 m² for closed storeroom; 13,568 m² for a switching yard; a floating dock; and a shipyard managed by the Industrial Service of the Navy for construction and maintenance of vessels. According to the head of ENAPU in Iquitos, the informality of most harbours in the region is directly related to corruption because, on the one hand, it allows the authorities to avoid responsibility as regards to what might happen in them and, on the other hand, public officials have more freedom to extort users by asking illegal payments.

4. Municipalities

According to the Peruvian laws, the Transport Ministry is responsible for first-level transport infrastructure, i.e. the primary road network, the airports and the main harbours in the country; whereas municipalities are responsible for regional and local-level transport infrastructure. However, the decentralization of these functions at sub-national government institutions has not translated into a general improvement in transport infrastructure, with few exceptions.

The main reasons for this situation are the lack of precise regulations on the competencies of local governments in transport; the lack of economic resources; the lack of knowledge by the local authorities regarding the technical principles and tasks they must develop for the conservation of the infrastructure; the privilege given to new works over maintenance; and the lack of specialized technical staff.

In the case of Iquitos, in spite of the large flow of river transport, there is not any harbour with the basic infrastructure to serve the demand of commercial passenger and light cargo transport, except for the river terminal managed by ENAPU. Loading and unloading both for large and small vessels is made directly on the river shore and on any place available. The local municipality manages only one of the more than 50 docks and piers in Iquitos –neither one legally acknowledged by the Transport Ministry. In the practice, this reduces to the collection of fees for land use. However, in some other localities in the region, municipalities have built docks and other harbour facilities managed by them, for which they generate income.

5. The Agriculture, Fishing and Energy Ministries

The local offices of the Agriculture, Fishing and Energy Ministries are responsible for controlling the extraction and commercialization of certain products through river ways. In the case of the Agriculture Ministry, the attention focuses on the extraction and commercialization of timber and some wild species of flora and fauna. The Fishing Ministry regulates the extraction of hydro-biological resources, whereas the Energy Ministry the transport of oil and fuels. However, such responsibilities are not fulfilled efficiently and, sometimes it is useless trying to, because of the lack of economic resources and the lack of priority by the respective authorities.

F. Intermediate Means of Water Transport in the Peruvian Amazon Region

1. Technological Evolution of River Transport

The technological evolution of river transport in the Peruvian Amazon region has not had the same development as the economic and social issues achieved by the region because instead

of responding to the needs and capacities of the local population, it has responded to certain opportunities of external technology import such as commercial boom, temporary customs release and oil exploitation. Technological improvements have been induced from outside. Thus, nowadays it is possible to find from the most primitive navigation techniques to the most modern and sophisticated vessels. The manufacturers of vessels and the local users have fell in a technological “trap” –instead of choosing to evolve gradually by improving propelling vessels and systems, they have brought from abroad “black box” technological systems into a poor region that lacks specialized training.

The first technological innovation took place during the Spanish occupation (16th century), when the traditional canoes used by indigenous people were modified to larger dimensions with several rowers so as to adapt them to trade and long-distance journeys. Later on, at the end of the 19th century, steam vessels manufactured in Europe and America and in some cases adapted in Brazil were introduced. However, such steam vessels were not so appropriate to navigate in the Amazonian rivers of Peru because they used to have an excessive draft for the abundant and not so deep tributary rivers of the Amazon and could not be used for most of the year. In spite of this, people struggled to reach inaccessible and remote spots in the eastern spurs of the Andes. Fernando Romero (Romero, 1983) describes how in 1867 two vessels hardly made it to the Mairo, located in the mountain foot of the central Andes, 80 leagues away from Lima, which generated comments in official circles on the fact that it had proved that it was possible to unite the capital of the country with the city of Iquitos.

As it is evident, a centralist relation has ever since determined the interest in river transport with the capital instead of the endogenous development of the region. As a matter of fact, the attention of the government toward transport development in Peru has been strongly focused on the construction of expensive roads centralizing in Lima; when these roads reach Amazonian territory they prove to be technologically inconvenient toward the environment.

In the middle of the 20th century, the Peruvian government put a customs legislation into force releasing the import of inexpensive small motors in order to promote trade and the transport of passengers in the Peruvian Amazon region. This was the beginning of the disappearance of steam vessels. The first motors to arrive were the Swedish outboard motors

Archimedes-Penta 10/12 HP and the Briggs&Stratton or “long tail”; the latter are locally known as “peque-peque.” Despite their extensive dissemination, these motors never got to be built locally. The sophistication of this new technology along with the wide variety of models, sizes and brands made it difficult to achieve specialization and standardization concerning repair, maintenance and parts. Consequently, the advantage of these motors in terms of speed and power has been limited due to the high operation and maintenance costs which reduce the useful life of the machines and the adaptation to the local environment, and increase the technological dependence on the outside⁷.

2. Small Vessel Typology

Nowadays, a wide variety of river transport means circulate in the rivers of the Peruvian Amazon region. They fall into two big groups –large vessels with over 30 tons of gross tonnage and small-medium vessels with a lesser tonnage. We shall concentrate basically on the description of the second group.

- Rafts

The first small-scale river transport means were wooden rafts for heavy cargo transport and canoes for passenger and light cargo transport. Rafts were much used in other times to transport cattle from the Andean mountain foot to the city of Iquitos. However, as a result of the introduction of motor transport means and the reorientation of commercial circuits through land routes to the capital of the country, rafts disappeared progressively.

Rafts are floating structures built of a number of logs or timbers fastened together with “*tamisha*,” a vegetal fibre of the region. Rafts are used to transport whole timber used in building houses and may reach a 5-ton cargo capacity. Rafts are slow, cost-effective and stable. Rafts are propelled by oars taking advantage of the river flow (4 to 6 Km/hour).

- Rowing Canoes

Nowadays canoes are still the main transport means used by wide sectors of the urban and rural population in the region. In the practice, canoes are the aquatic version of bicycles,

⁷ DURAND, Eduardo. 1992.

that is, they are cost-effective, easy to acquire, versatile and ideal for short-distance journeys. As a matter of fact, canoes are an essential element in the social and economic life of Amazonian inhabitants and are firmly rooted in the local culture.

Canoes are small wooden vessels propelled by oars. Canoes may vary in dimension –the largest ones may reach 15 m of length, 1.5 m of beam and 0.60 m of depth of hold with cargo capacities of up to 300 kg and an average useful life of 8 years. In general, canoes are built by using the technique known as “melting” –a number of logs are dug lengthwise and opened wide by using heat. Canoes are slow, have little cargo capacity, good maneuverability but are very risky due to their instability. In some cases, a low-power propelling motor (long tail) is adapted as an alternative to oar use.

Photo 1

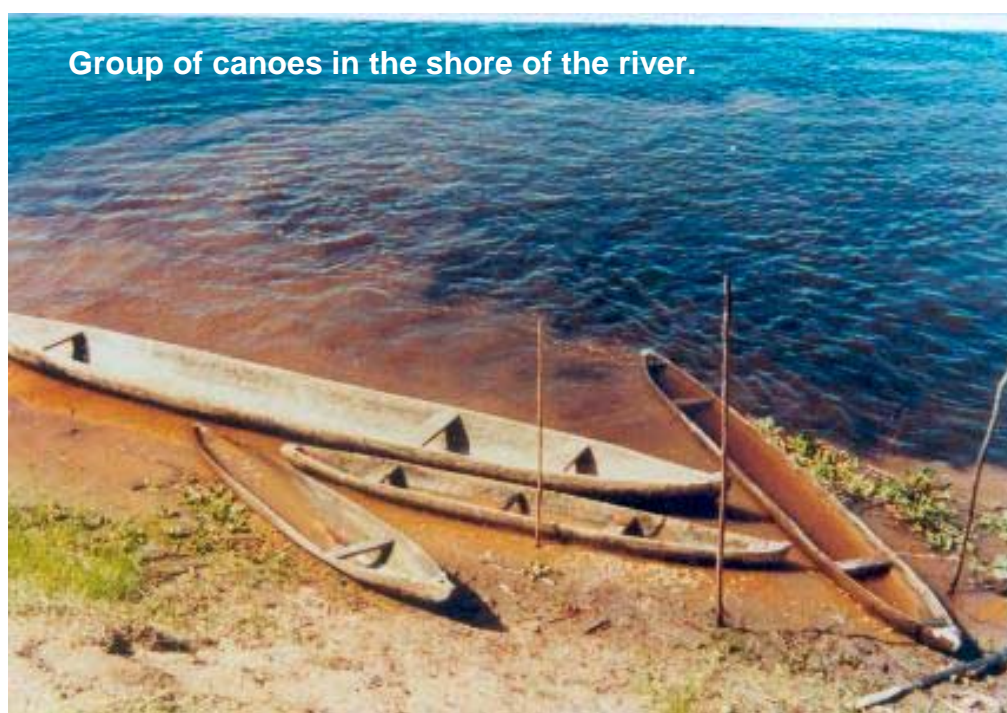


Foto: Colin Palmer

Canoes are used by men, women and children, who learn how to steer them at a very early age in order to meet a variety of needs, e.g. fishing, access to agricultural plots, transport of goods, trade, access to education, health and services in larger localities, exchange with neighbor communities, entertainment, etc. Canoes are built both in urban and rural areas either by users themselves or by local artisans since it does not require

much specialization. Due to the low monetary economy, the cost of a canoe is very relative, particularly in rural areas. The information gathered through surveys does not allow establishing cost parameters and market prices. The valorization logic is based basically on the amount of work and number of days spent in the construction, the degree of difficulty to get the appropriate timber, and also according to the type of personal relation between the constructor and the requester. As a matter of fact, for rural inhabitants canoes are neither seen as a sign of wealth nor considered as a capital good, they are just instruments that make daily life easier. This is closely related to the particular concept of ownership that rural Amazonian inhabitants have; the person who does not have a canoe, just borrows one.

- Wooden Motor Boats

Motorboats for private use are different from the ones for commercial use in the size and power of the propelling motors. The former are usually used by their owners to transport agricultural products or other merchandise for retail commercialization. The latter are used to provide regular cargo and passenger transport services among the different localities in the region.

Photo 2



Foto: Ranjith de Silva.

The average dimensions of boats for private use usually range from 8 to 10 m of length and 1.5 m of beam with a cargo capacity of up to 3 tons. While some use outboard motors with an average 40 HP, most boats use the “long tail” system with power ranging from 6 to 16 HP. On the other hand, boats for commercial use are bigger with dimensions ranging from 11 to 19 m of length, 1.5 to 3.2 m of beam, and 0.7 to 1.2 m of depth of hold. Peak roofs made of vegetal matter tend to be used. The cargo capacity ranges from 2.5 to 10 tons. These vessels usually use outboard motors of an average 100 HP, and the useful life depends basically on how they are used, but usually ranges from 8 to 15 years in average.

These vessels are built and maintained by artisan carpenters specialized in these tasks at provisional lumber yards set up in the shores of the rivers usually close to the main harbours of the region.

The most frequent construction technique used to build these vessels is known as “warping.” Warps (1 ½-inch boards) are placed around a structure made up by a template, or hull bottom, and frames on which warps are fastened. The number of warps depends on the height of the vessel. The “mirror” is then placed in the stern, where the outboard motor is installed; or a board to use the *peque-peque*. Finally, oakum (vegetal matter of the region) is placed and tar is applied to render joints waterproof. It is worth mentioning that one of the main problems faced by the constructors of boats and canoes is the unavailability of appropriate timber, which is scarce due to the selective and uncontrolled felling of trees and the occupation of riverside land preventing the access to inner woods.

Photo 3



Foto: Colin Palmer

Timber used in the construction of boats and canoes	
HULL	
<u>Common Name</u>	<u>Scientific Name</u>
<i>Anacspi:</i>	Apuleia sp.
<i>Canela moena:</i>	Endlicheria anomala
<i>Moena amarilla:</i>	Aniba sp.
<i>Cedar:</i>	Cedrella sp.
<i>Lagarto caspi:</i>	Potrium apiculatum
<i>Catahua:</i>	Hura crepitans
<i>Itauba:</i>	Mezilaurus itauba
<i>Aguano:</i>	Virola sp.
ROOF	
Yarina Palm	Phytelaphas microcarpo
Yrapay Palm	Lepidocaryum tessmannii

Source: Eduardo Durand. 1992.

- Gliders

Outboard motor technology and aluminum and plastic fibre use gave place to the appearance of very fast light boats with small draft and little cargo and passenger capacity. These vessels, known as gliders, have a high operation cost and the motors have a very short useful life. Gliders were initially designed for sport and tourism, but have been adapted to the region for various uses that require great speed, e.g. police, official transport, etc. Gliders are also used in illegal activities such as drug trafficking, for which operation costs are not a drawback. Currently, glass fibre gliders are not manufactured anymore; only aluminum gliders are manufactured in the city of Iquitos. Their average price ranges from US\$ 8,000 to US\$ 10,000, apart from the cost of the outboard motor.

Photo 4



Glider with outboard engine

Foto: Colin Palmer

Advantages and Disadvantages of Small Vessels according to users' opinion		
Type of Vessel	Advantages	Disadvantages
Rafts	<ul style="list-style-type: none"> • Low construction, operation and maintenance costs • Good stability • Versatile • Good cargo capacity 	<ul style="list-style-type: none"> • Slow • Poor maneuverability • Use limited to abundant rivers and during rainy season • Unsafe for the crew • Short-distance journeys
Canoes	<ul style="list-style-type: none"> • Low construction, operation and maintenance costs • Good maneuverability • Durable • Versatile 	<ul style="list-style-type: none"> • Slow • Poor stability • Little cargo capacity • Unsafe for the crew • Short-distance journeys
Wooden motor boats	<ul style="list-style-type: none"> • Good cargo capacity • Fast • Stable • Durable • Comfortable • Short, medium and long-distance journeys 	<ul style="list-style-type: none"> • High price, operation and maintenance costs
Metal gliders	<ul style="list-style-type: none"> • Fast • Stable • Safe • Comfortable 	<ul style="list-style-type: none"> • Very high price, operation and maintenance costs

Photo 5



Foto: Colin Palmer

3. Small Vessel Motor Typology

There is a wide variety of propelling motors for small vessels. There are many companies commercializing these motors in more than 10 Amazonian localities. Small vessel motors basically fall into two categories –(i) outboard motors and (ii) industrial motors adapted locally for river navigation known as “long tail” or “peque-peque.”

- Outboard Motors

The most commercial brands are Johnson, Evinrude, Yamaha, Mariner and Suzuki, with power that ranges from 8 HP to 185 HP. The ones with the highest demand range from 40 HP to 55 HP (6,000 RPM.) Most of them use gasoline, although recently Kerosene-fuelled motors have been introduced.

They are usually two-stroke motors with 2 sparking plugs and 2 pistons. A mixture of gasoline and two-stroke oil is used (a proportion of ¼ per litter), and also transmission oil of 20, 90 or 140 SAE. Users said that Yamaha motors are the ones with the best quality

and guarantee because they can operate even when there are internal breakdowns and unoriginal parts can be adapted. A mixture of gasoline (20%) for the start and Kerosene (80%) for the operation contained in two different tanks (2 carburetors) is used. The useful life varies according to the brand and the use, but usually ranges from 2.5 years for the most economic ones to 15 years in some extraordinary cases. The most vulnerable parts include rings, pistons, helixes, the gearing rotation axle, the crankshaft wheels, the packing of the head, the water pump, the connecting rod and the carburetor.

- Long tail Motors or *Peque-peque*

This system is a unique case of local technological adaptation, though artisan-level and provisional. It started with the introduction of small one-stroke Briggs&Stratton motors, which remain the most used ones due to their versatility and simple design, operation and repair. Initially designed as stationary motors, they were adapted to propel boats and canoes. They were disseminated also due to their alternative uses as pumping motors, energy generators, grain mills, etc.

Photo 6

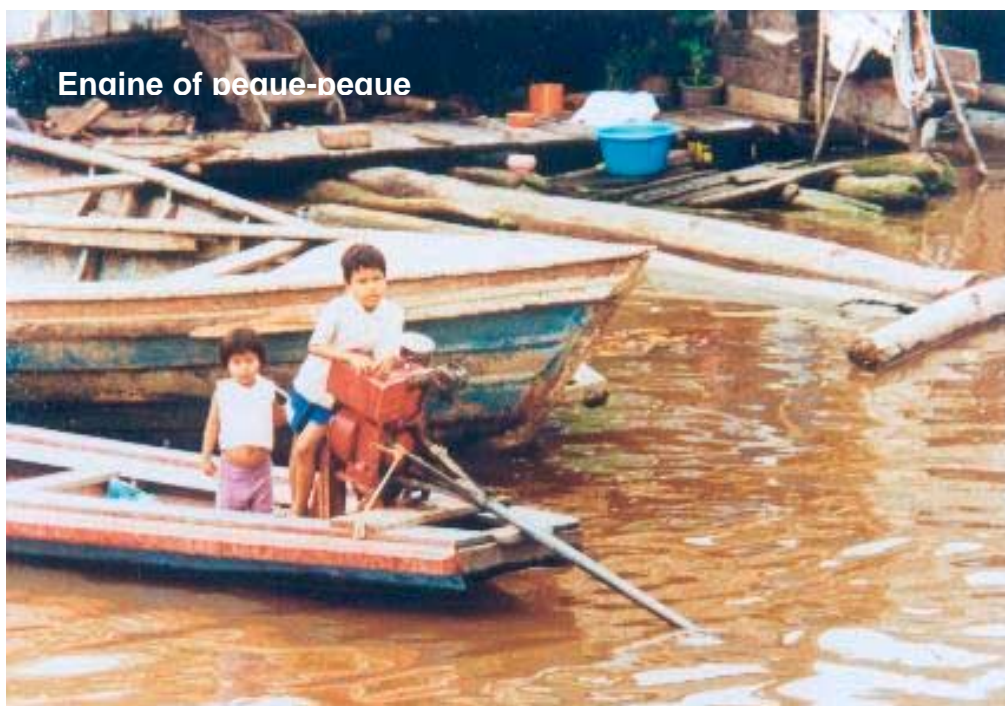


Foto: Colin Palmer

The most commercial brands are Briggs&Stratton, Suzuki and Yamaha with power ranging from 5 HP to 16 HP. The most popular ones are the Briggs&Stratton of 9, 12, 14 and 16 HP often used in light vessels and short-distance journeys. They have only one sparking plug, piston, platinum and coil. They may have 2,700 or 3,600 RPM and use aluminum helixes with 2 or 3 blades. The Briggs&Stratton of 16 HP has a part known as “counterweight” or “balance” aimed at reducing motor vibration. In some places an additional device known as “shovel” is used as a second steering wheel to facilitate maneuverability.

Photo 7



Foto: Colin Palmer

“Long tail” motors have an average useful life of 6 years (up to 0.100” of cylinder rectification.) A Briggs&Stratton of 9 HP in good shape consumes 1.5 litres of gasoline per hour and 2 litres of four-stroke oil every 40 hours of navigation. The most vulnerable parts are rings, pistons, coils, the cylinder, the carburetor and the helixes. As with outboard motors, all spare parts are brought from abroad, except for the helixes and the

connecting rods, which are manufactured by 3 or 4 small artisan smelting plants in Iquitos and Pucallpa. These smelting plants buy aluminum pieces discarded from outboard motors, which are melted in small metal containers heated with charcoal. The liquid metal is poured into plaster moulds and then cooled in water.

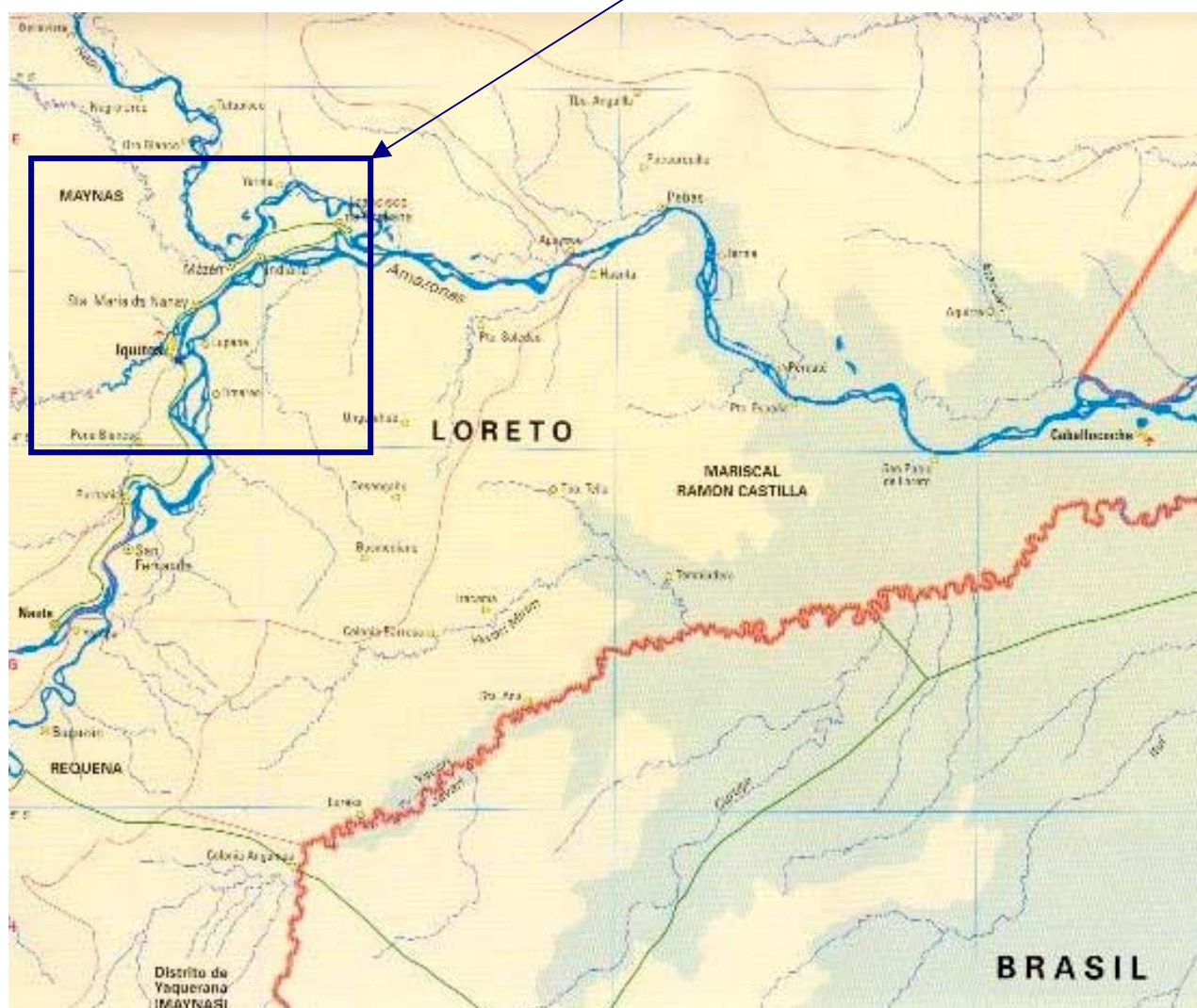
Main Characteristics of Outboard and Long Tail Motors					
Type of motor	Brand	Power (HP)	Price US\$	Advantages	Disadvantages
Outboard	Yamaha	15	1,665	<ul style="list-style-type: none"> • Fast and quick • Portable • Good finish • Electric system • Regular stock of spare parts 	<ul style="list-style-type: none"> • High price, operation and maintenance costs • High fuel consumption • Sophisticated technology that requires maintenance specialization • Not very resistant and durable • Import spare parts available only at commercial stores in big cities
		25	2,100		
		40	2,825		
		60	3,200		
	Johnson	15	1,000		
		25	1,200		
		40	2,200		
		55	2,400		
		65	3,000		
		100	5,000		
Mariner	10	1,500			
	60	3,775			
Long Tail	Briggs & Stratton	9	750	<ul style="list-style-type: none"> • Low price, operation and maintenance costs • Simple technology that facilitates repair • Low fuel consumption • Versatile • Resistant and durable • Some spare parts manufactured locally are available small localities 	<ul style="list-style-type: none"> • Slow • Low power • Inefficient energy consumption
		16	1,000		
	Suzuki	5	280		
		9	580		
	Yamaha	12	475		

MAP 6



Location Map: Iquitos, Mazán and Paraiso.

The town of Mazán is to the northwest of Iquitos, on the Napo river. The quickest way of accessing from and toward the city is through the Amazon River until one point before the town of Indiana, from where the trip is continued by motorized tricycles (three-wheels). The town of Paraiso is at 1km farther down Mazán.



Source: Great Universal Atlas. El Comercio. Volume 3. Pg. 15

G. Case Study: Fluvial Transportation in Iquitos

1. General characteristics of the city of Iquitos

1.1. Location, population and economy

Iquitos is the biggest city in the Peruvian Amazon. It is located at the east of the country, in the shore of the Amazon River and in the full humid tropical forest, in a point relatively closed to the confluence of the Ucayali and Marañón Rivers that originate it and at the Peruvian border with Brazil and Colombia.

The origin of this city goes back in the history to a small town founded by the Jesuit missions that grew slowly thanks to its localization advantages to the fluvial trade. By the middle of the XIX century, it begins to highlight as an urban center when the pattern of regional development begins, going on up to now, based on the extraction and export of raw materials. Towards the end of the century, the development of the extractive industry of rubber that then represented 22% of the national exports, and the construction of the port of Iquitos that allowed the entrance of ships of great draught coming from Brazil and the Atlantic Ocean, revolutionized its growth until transforming it into one of the main cities of the Amazon⁸.

At the present time, Iquitos is considered among the main cities of the country, with an estimated population of 314,419 inhabitants in 2002. Besides being the capital of the Department of Loreto, it has administrative and commercial influence on a vast territory. The economy of the city is based fundamentally on the internal and external trade, in the educational services, health, government, security, information, transportation, etc., and in the tourism. The manufactory industry is practically nonexistent.

Since the importance as the main urban center of the Peruvian amazon, the city of Iquitos and its surroundings, among them are the towns of Mazan and Paraiso, concentrates an extremely varied population of ethnic and cultural origins that has derived in a complex cross of races with native, Andean and European roots. Also, the city is located in a point

⁸ DURAND, Eduardo. 1992.

where several ethnic territories of different linguistic origins converge, for what the predominant language is Spanish.

Indicators of the Department of Loreto, capital of Iquitos		
	Loreto	Peru
Surface	368,851 km ²	1'285,216 km ²
Population (2000)	880,471 Hab	25'661,690
Population density (2000)	2,39 hab/km ²	<5,263 – 0,99> hab/km
Urban Population	58%	75%
Index of illiteracy (1993).	10,8%	13,0%
Educational Level (1999)		
Pre-school	12%	10%
Elementary School	68%	60%
High School	20%	30%
Rate of Fecundity (2000)	4.5/1000	3/1000
Rate of infant mortality (2000)	56/1000	45/1000
Number of doctors (1996)	4.2/1000	10.3/1000
Index of poverty (Iquitos)	62.4%	54.8%
Index of extreme poverty (Iquitos)	34.9%	24.4%

Source: Statistical Summary of Transportation and Communications. 2001. National Institute of Statistic and Informatic. Lima, Peru. 2001.

1.2. Accessibility

Iquitos is articulated to the rest of the region and the country by air and fluvial transportation, through which it is connected with the ports of Pucallpa and Yurimaguas in order to access to the national net of highways. The transportation by car is not very significant, because there are only small tracts of highways and they are not in good condition shape toward the neighbor towns. Due to the conditions of the natural means, the construction and maintenance costs of roads are excessively high. The air transportation carries out a complementary function to the river transportation, connecting it with the main cities of the region and country, and as a strategic support in the control of the border and the drug traffic. Due to their nature, it is oriented to the traffic of passengers and of loads of high added value.

1.3. Infrastructure and port services

The port infrastructure of the city of Iquitos is conformed by the Fluvial Terminal of the National Enterprise of Ports (see chapter regarding the Administration System of Transportation), the informal piers of the neighborhood of Punchauca and the port of Belen.

The piers of Punchauca

The piers of the neighborhood of Punchauca are the ones that support the biggest port activity in the city. It is an area of approximately 5 kilometers located along the entrance of the bay of Iquitos, whose depth allows to dock to all the big crafts of transportation of load and passengers and some other of smaller size. In this same river shore are also located the facilities of the National Enterprise of Ports, the shipyard of the Navy Industrial Service, the piers of the Captaincy of Ports and of the national enterprise of petroleum and another of private use.

In the sector where the piers are used for public service, the slope of the bank is very marked and it varies from 9 to 12 meters of height between the periods of growing and decreasing, so the access to the crafts is made through permanent ladders or ladders that can be lifted that go from the border of the river to the level of the waters. In the practice, each one of these ladders is a pier that lends services to certain type of users. However, none of them have the minimum infrastructure conditions to assist the intense flow of passengers and the load that supports. There are neither cranes nor platforms for the shipment and landing, neither appropriate warehouses.

Each pier has its own way of organization. Some are of private property for the use of small tourist and institutional crafts, and they have good accesses and cement piers and other services like restaurants and small commerce. Others are administered by the diverse wholesale markets that are in the area and that are supplied of the products that arrive from the river; and the biggest ones, administered by the Municipality of Punchauca, are the ones used by the big crafts of public transportation, load and passengers that pay 35 soles per day (\$10) in order to stop in their banks and to use the stairways. It is impossible to calculate the volume of load and passengers that

circulates for these piers, because the informality of the activities and the absence of authorities doesn't allow any type of reliable registration. The official information that we present next corresponds in particular to the movement of weighted load that is carried out in the Fluvial Terminal of Iquitos and in the facilities of the national enterprise of petroleum.

Indicator of the movement in the Port of Iquitos				
	1997	1998	1999	2000
Number of registered units of fluvial transportation.	361	400	465	422
Comparative movement of ships.	382	436	934	1,108
Comparative movement of containers.	299	352	165	104
Tones of mobilized loads (thousands)	52	68	138	168
Tones of import load (Iquitos / National) (thousands)	13 / 6,700	15 / 8,670	38 / 6,948	43 / 6,900
Tones of export load (Iquitos / National) (thousands)	6 / 6,082	5 / 4,663	8 / 5,688	10 / 6,499

Source: Compendio de estadísticas de Transporte y Comunicaciones. Instituto Nacional de Estadística e Informática. Lima, Perú. 2001.

The stow and distow services of cargo are informal and they are assisted by non-organized individuals and for small contractors for tasks of medium breadth. On one hand, there are the ones that board by themselves the crafts of public transportation and passengers that arrive to the piers loaded with the most diverse products and merchandises from the riverside towns, with the purpose of buying some load that then they can resell in the pier or of offering their stow services to unload any volume. The rates for these services are not preset, so the prices are agreed at the moment depending on the type and the volume of the load.

On the other hand, there are the small informal contractors that offer stow and distow services mainly to the big load crafts, establishing verbal agreements with the bosses without more guarantee. For the work, they use very cheap manpower, which is paid by the piece and not more than \$10 per day, without any type of appropriate equipment or safety measures. Several informants told us the story of an accident that happened not that long ago, in which several young stowers that had been hired by an informal contractor to unload chemical products died. One of them, without knowing

the product, lit up the light of the warehouse originating a tremendous explosion that ended with their lives. The later drama was that nobody knew who should assume the responsibility of the fact, because the boss of the craft, the informal contractor, the Municipality of Punchauca owner of the pier and the Captaincy of Ports were involved in it.

The Port of Belen

The port of Belen is located in the poorest and crowded neighborhood of the city and at the same time, the most commercial of all. In the practice, it doesn't properly exist a port in the neighborhood of Belen, what exists is a dense urban mass located at the bottom of the bay of Iquitos, in the mouth of the river Itaya whose residents are mainly dedicated to the trading and the rendering of services in small scale. Besides being the main market of the city and concentrating the biggest offer for construction services, repair and maintenance of botes and engines, Belen is also a point of connexion between Iquitos and the countless rural towns located at the rivershore of the Itaya River.

Photo 8

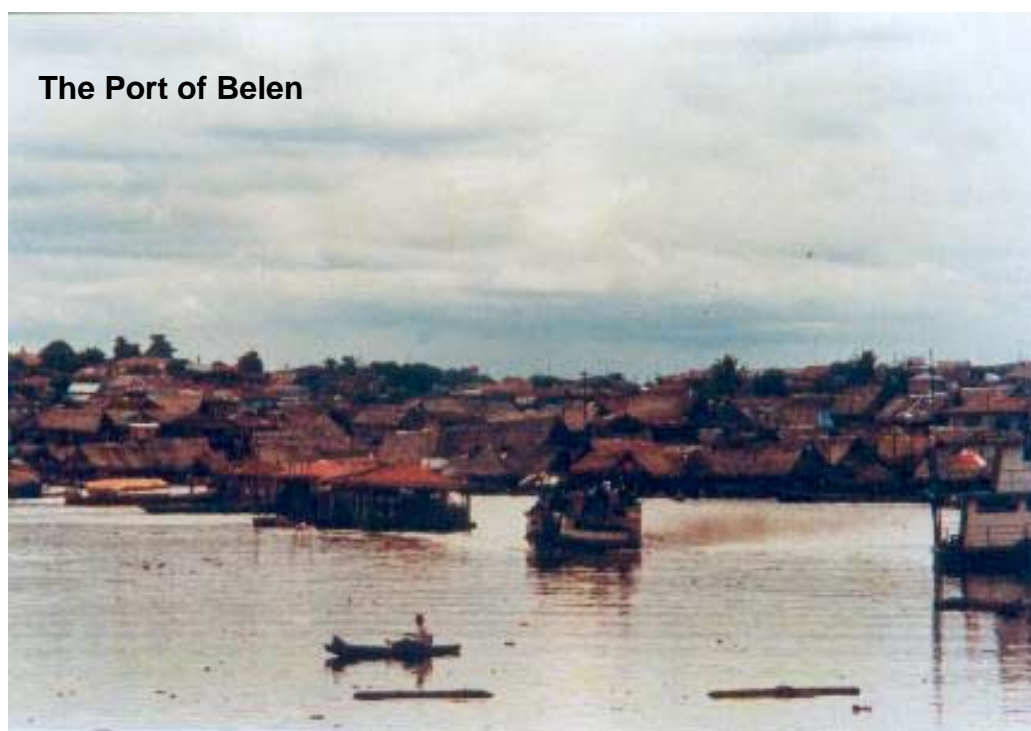


Foto: Colin Palmer

All the crafts that circulate in Belen are of small depth. Most are canoes and peque-peques of private use for trading activities to the retail or for displacements of short distance, although wooden boats with outboard motors that trade products with more distant areas or transport passengers to neighboring towns also circulate.

In periods of growing, the water flood a considerable part of this neighborhood, so the housings are built on wooden pillars, and the circulation is made exclusively by water or by small wooden bridges interconnected to each other. The place lacks facilities for the load and discharge of products, jetties don't exist, neither store neither appropriate facilities for services neither services of port administration.

Photo 9



Foto: Ranjith de Silva

During overflowing periods, the water floods a very considerable area of this neighborhood, so the houses are built on wooden pillars and the circulation is made exclusively by water or by small wooden bridges connected among them. The place lacks of facilities for loading and unloading of products, there are not piers, or appropriate facilities for services neither services of port administration.

2. The fluvial fleet in Iquitos

At the present time, it is not possible to determine the size of the fluvial fleet that operates in Iquitos, since the official registrations of the Ministry of Transportation are incomplete, and they do not consider the smallest crafts. According to the information obtained in this dependence of the state, to date they are only 393 crafts registered, all of them over 30 tons of load, although it is admitted that these represent less than 50% of the existent crafts in this category. According to the 1991' statistics, 980 ships existed then, with a total carrying capacity of 83,724 tons.

Enterprises and Vessels registered by the Executive Direction of Aquatic Transport in Iquitos (2002)		
	Number of enterprises	Number of vessels
Commercial passenger and cargo transport enterprises	63	278
Enterprises that provide logistics support to oil production	13	70
Social support enterprises	1	1
Tourist transport enterprises	8	44
Total	85	393

A notorious characteristic of the fluvial assemblage is its antiquity. Between 1981 and 1991, the fluvial fleet of great tonnage registered a very low growth, passing from 898 to 980 crafts. However, the small crafts (boats with engine) increased from 168 to 384 units. This is due to the fact that most of the fluvial fleet for big loading was built in the 70s, with the initial development of the petroleum industry.

In the last decades, the economic recession and the difficulties of market of the regional main export products has have a negative repercussion in the region, reducing the agricultural and forest production, the fishing, the trade and the manufactory. Every time there is less load and passengers to transport, and every time the costs of acquisition, operation and maintenance of the ships are higher.

3. Flows and characteristics of the offer and demand of services of river transportation in the Iquitos region.

3.1. Flows in the first distance ratio

The biggest river transportation flow in Iquitos is formed by hundreds of small crafts of private and commercial use that circulate in a radius under 100 km of distance, connecting the city to the towns and rural communities of its environment.

The private crafts, in general the most numerous and small, are of diverse types and they correspond to the use that they receive. The canoes with paddles and the peque-peques are usually used by small farmers and fishermen and by poor urban residents to go to their parcels, to fish, to trade or for simple displacements inside the urban area and their peripheries. As a mean of basic transportation, the canoes and peque-peques are driven indistinctly by men, women, adolescents and inclusive by children. On the other hand, the gliders and the boats with outboard engines are usually driven by male operators for transportation of officeholders, for sport and assistance uses. In the amazon resident's mentality the use of motors and the handling of mechanics is an activity tacitly reserved to the males, although that doesn't mean that moral sanctions exist to the women that make it.

Photo 10



Foto: Colin Palmer

The crafts of commercial use, conformed by boats and gliders with average capabilities of load of 12 tons and impelled with outboard motors of 100 HP of power, are used by transportation companies that offer loading and trading services of agricultural and manufactured products between the city and the towns of the area, and by small companies that lend services of transportation of passengers (20 on the average) between the city and the near towns of the area.

Photo 11



The owners of these companies usually have several crafts in the marked and they work in a semi-illegal way. They hire in an irregular way the services of motorists and assistants (two for each boat) in order to operate the crafts in preseted routes by themselves according to the demand of the market, and although they can have tributary registrations and operation licenses, they do not always fulfill the rules and regulations established. These managers of the slight transportation are not organized in associations and they operate in an autonomous way. The payments that they agree with the operators either correspond to percentages of the revenues obtained by the load transported or to the number of sold tickets at the beginning of each trip and according to the number of passengers that return to the starting point, without considering those that can board along the route. This makes that regular itineraries do not exist in this type of transportation of passengers, because the operators begin the trip once they have been able to sell all the available seats.

The users of these public transportation services are usually the residents of the towns near to Iquitos that use these means to access the city: farmers, lumbermen, housewives, children, students, old men, public employees, etc. that travel for commercial or supply reasons, in order to use the public and social services, to get their paychecks and benefits or for other personal reasons.

The rates of the tickets vary according to the distance, although in any case they exceed the 20 soles per trip to the most distant towns (\$6 approximately), what can be an excessive sum for many rural residents. For example, the cost of a one-way ticket to Mazan, a town located in this first distance ratio is 6 soles per one hour trip (\$1.80), and it starts to add sol by sol as it moves away from the city. Since it does not exist a public organism that regulates the rate of the tickets, it is the offer and demand the one that determines the rates of the transportation. Comfortable crafts with powerer engines can charge up to 50% more than others of smaller quality for the same trip.

3.2. Flows in the second distance ratio

The flow of second level corresponds to the commercial transportation of load and passengers of medium distance, in a radius that varies from 120 km to 220 km of distance, between the city of Iquitos and the intermediate cities of its influence area: Nauta, over the Marañón river; Requena, over the Ucayali river; and Pebas over the Amazon River.

It is a flow mainly composed by crafts of 160 tons approximately, locally called "motor ships" or "boats" that use diesel motors of 200HP of power and more, and they can transport simultaneously, in two storeys, a great quantity of passengers and of load. It is estimated that there are between 40 and 60 crafts that perform this type of services around the city of Iquitos.

Photo 12



In practice, these crafts carry out at the same time the role of load trucks and buses of passengers in the terrestrial routes, besides lending other related services like couriers and sending of non accompanied load.

In general, each owner or *armador* possess several of these crafts that operate indirectly through hiring contracts whose costs fluctuate around the \$10,000 monthly, amount that must be paid by the captain that rents the ship once the contract has expired. Frequently, these contracts are only by word of mouth and absolutely irregular, because there are not warranties, insurances or payment of taxes. In order to gather the money, this one must make the biggest number of possible trips with the biggest quantity of load and passengers. The results are that the conditions of the trips are really deplorable: there are not set-up schedules of departures and arrivals neither preseted rates, the density of occupation per square meter inside the craft reduce to the minimum each passenger's space, the security and the hygiene are scarce, the speed is slow and the distances are very

long, all of which makes that the travelers spend 3 or 4 days on board of the ship, in hammocks and in the middle of the load, until they get to their destinations.

Some *armadores* are organized in the Association of Armadores of Iquitos with the purpose of defending their union rights, although many others, mainly those that own bigger number of crafts, prefer to stay aside of the Association negotiating their interests individually, many times by corrupt practices.

In the same way that in the small crafts of public transportation, there is a strong competition among the crafts of medium range, and the rates of the tickets can vary substantially according to the seasonal demand and the quality of the services offered.

The users of these public transportation services are of the same type that those that are found in the first distance ratio, only that they have origin and destination points so far away, and that some only use the loading services to transfer their merchandises to the urban markets. In their majority, the trips to the city are related with the trading, with the rendering of public services (justice, processing of documents, collection of wages, etc.) and the specialized services of health, and many for family or personal reasons.

3.3. Flows in the third distance ratio

Finally, the flow of the third level corresponds to the heavy transportation for load crafts of up to 8,000 tons (There is only one Peruvian ship with this ability that transports heavy load between Iquitos and the external markets through the Amazon River and the Atlantic Ocean), and they circulate in a radius of 600 km to 1,000 km of distance to the intermodal ports of Pucallpa and Yurimaguas.

The assemblage of ships is formed by a variety like tugboats and pusherboats, cargo ship carriers, tankers, load and passengers motor ships, etc. Those of heavy load usually use the Fluvial Terminal of ENAPU or the facilities of the national enterprise of petroliums, while the passenger are the same that operate in the second distance ratio and that use the piers of Punchauca. The biggest ones have begun to have difficulties to enter the Bay of Iquitos because the progressive withdrawal of the bed of the river reduces every year the level of depth of the waters. This constitutes one of the main concerns of the national and

regional authorities, because they can't decide if they build a new fluvial terminal in the new channel of the river or to dredge the bottom of the current terminal in order to assure the continuity of the entrance of heavy ships.

Most of the owners of the big load crafts, of the tugboats and the pusherboats are also the owners of the *launches* that make massive transportation of load and passengers, and that we have described in the previous section. However, an important part of this fleet is property of the company of petroleum and assists a specific market.

4. Offer of goods and services of the fluvial transportation in Iquitos

4.1. Offer of crafts

At the moment, the offer of new crafts in Iquitos it is reduced to the canoes and wooden boats built by local specialized carpenters. In the shipyard that the Marina Industrial Service has in the facilities of the Fluvial Terminal of ENAPU, boats are also manufactured. (See chapter about Typology of smaller crafts). The market of new bigger crafts has been in total recession for more than 20 years and it is only possible to acquire those of second hand.

According to what the interviewed carpenters in Iquitos say, the demand for their services is such big that they usually work to exclusive dedication, always by order of the interested parties and according to the owner requirements. It prevails the maintenance of hulls and the construction of light crafts of 10 meters of length in average for commercial use of load and passengers. All the interviewed carpenters say to have learned this occupation directly in the practice, since in the city an offer of specialized training doesn't exist in this matter.

The time of construction of one of these crafts varies between 15 to 45 days, depending on the size of the ship, of the wood availability and the financing, as well as of the number of operators that are included in the process.

Photo 13

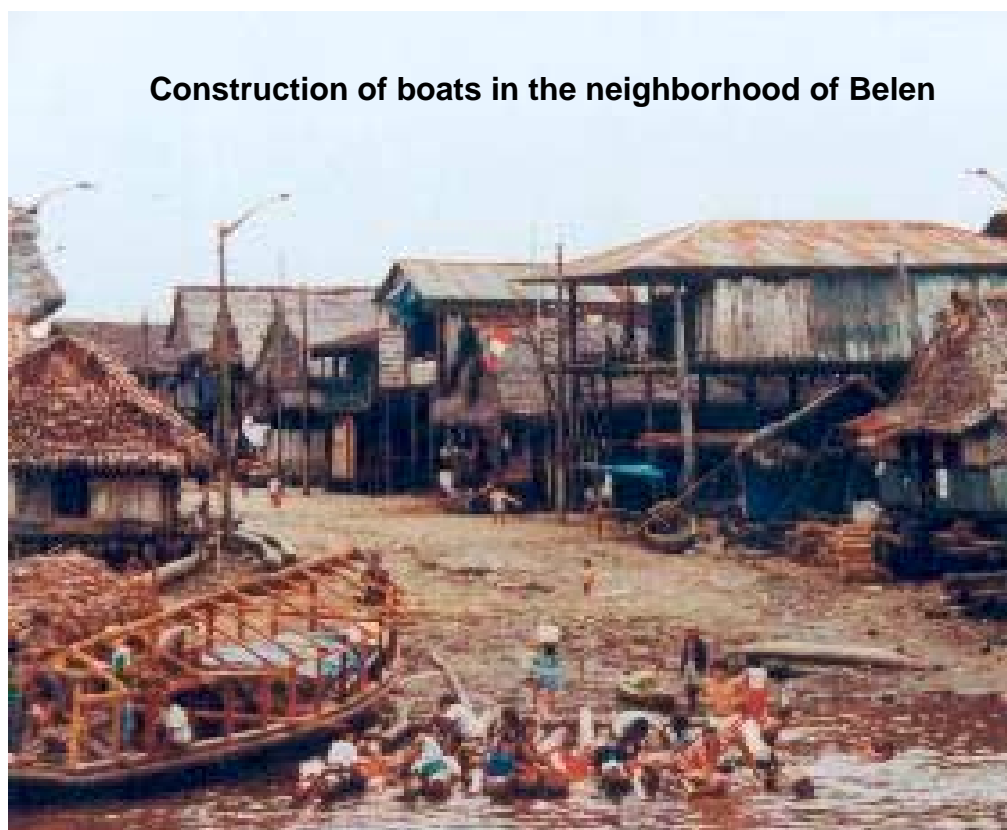


Foto: Colin Palmer

The prices of new units vary according to the characteristics of the ships. The canoes oscillate among \$50 and \$500, and the boats with engine among \$2,500, those of 3 to 5 tons, and \$8,000 those of 15 to 20 tons. In general, the form of payment is made in installments as the construction advances and according to the buyer's capability.

Lastly, the offer of credits in the formal financial system to acquire crafts is very limited and only accessible to certain well-known clients of banks that they work with, regularly.

4.2. Offer of engines

In the city of Iquitos there is a dozen of commercial institutions specialized in the sale of engines and spare parts, whose prices vary depending on the brand and the power, between US\$1,000 and US\$7,000. The sale system is usually cash, although sometimes, during periods of economic stability, some commercial stores offer credit systems without

a bank mediation, with interest rates of over 50% annual and personal or commercial warranties. In general, these trades centralize the import of engines and spare parts, so they usually have stock of pieces that are distributed among their representatives in other towns of the region.

Prices of engines of more demand in Iquitos			
Type of engine	Brand	Power (HP)	Price US\$
Outboard	Yamaha	15	1,665
		25	2,100
		40	2,825
		60	3,200
	Johnson	15	1,000
		25	1,200
		40	2,200
		55	2,400
		65	3,000
		100	5,000
Mariner	10	1,500	
	60	3,775	
Long Tail	Briggs & Stratton	9	750
		16	1,000
	Suzuki	5	280
		9	580
	Yamaha	12	475

4.3. Offer of Spare Parts for Engines

All the spare parts of engines are import from abroad and there are not major problems to supply the companies of Iquitos. The only exceptions are the propellers of "long tail" engines, since it is a local technological adaptation; and in smaller measure the *connecting rods* that are manufactured by 3 or 4 small handmade foundries of Iquitos and Pucallpa. For that purpose, they buy discarded aluminum pieces from the outboard engines that are melted in small metallic recipients heated with vegetable coal. The liquid metal is poured in molds made of plaster and then cooled in water.

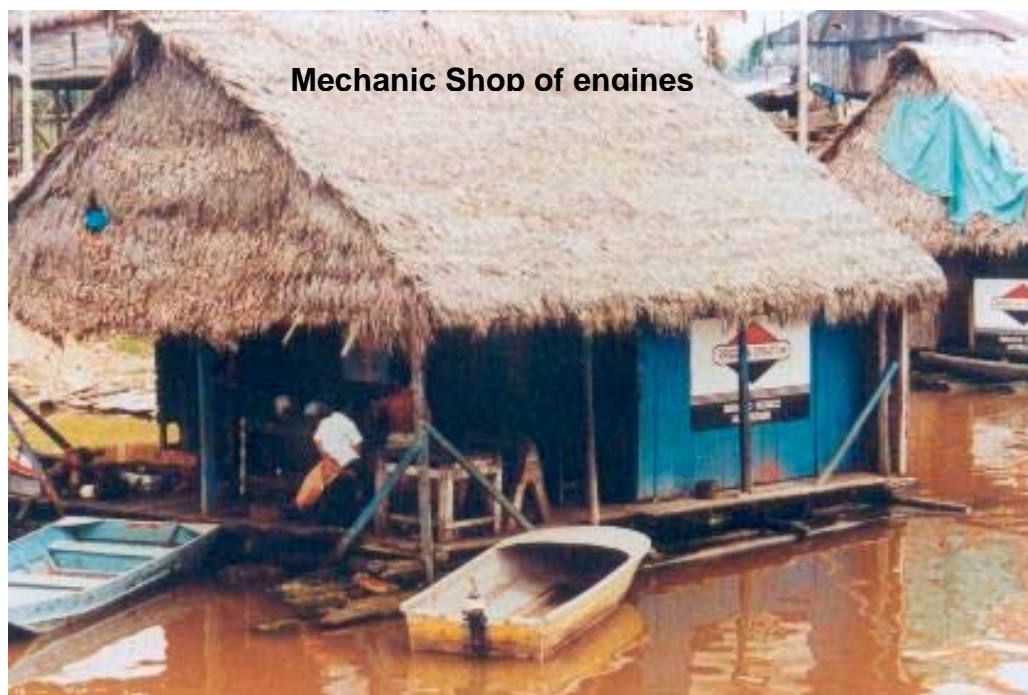
In the interview to the biggest of the small founders in Iquitos, we could check that it is a barely developed and very informal industry. In spite of having an enormous captive market, the owner does not have working funds neither an organized distribution net, nor it has an accounting record of the incomes and expenses of his company. In fact, there is no difference between the economy of the company and the family economy, so it was impossible to calculate the production volume and the costs and benefits that he perceives. The sale prices in the foundry are S/2.00 per propeller and S/18.00 per connecting rod, and then are resold by mediators from the same city for 6 or 8 times this value.

The production is only made by order of the mediators (it assures that the demand is constant and stable) and the payment in advance to buy the necessary inputs. They also do not have standardized models of their products, so they manufacture molds starting from the samples that the buyer gives.

4.4. Repair services and maintenance of engines

In the city of Iquitos, and particularly in the port of Belen, great number of mechanics that offer all type of services of diverse repair quality and maintenance of engines exist. The critical point is observed clearly in the absence of this type of services in other towns of the region, so the mechanics of Iquitos assist to a quite wide regional demand.

Photo 14



Although the average costs of the repair services and maintenance of engines are not very high, frequently they are outside of the reach of the poorest people, due to the market price of imported spare parts. This makes that many crafts operate with engines in bad shape, or they are simply paralyzed by long time while their owners save the necessary money to repair them.

H. Case studies: Water Transport in Mazán and Paraíso

1. General characteristics of Mazán

Location, population, economy and social services

Mazán is a relatively important place in the area of influence of Iquitos, with rank of district capital. It is in the shore of the Napo River near the confluence with the Amazon River. This is a river of long journey that is born in Ecuador and it is the biggest affluent of Amazon River in the Peruvian territory. The climate, as in the whole region, corresponds to the Humid Tropical Forest that translates in an annual average temperature of 28° centigrade, annual precipitation bigger than 1,000 millimeters and high relative humidity.

General Indicator of the Mazan Neighborhood	
Surface	9,922 km2
Population	
Estimated Population 2002	15,598 hab
Urban Population	13%
Rural Population	87%
Male Population	53%
Female Population	47%
Density of Population	1.6 hab / Km2
Growth rate inter-census 1981 - 1993	3.8%
Percentage of population over 15 years old	49%
Education	
Illiteracy rate of the population over 15 years old.	21%
Percentage of population over 15 years old that have finished elementary school.	47%
Housing	
Total of particular houses	1,904
Houses with drinking water	0
Houses with drainage service	6
Percentage of houses without drinking water, drainage service and electricity.	84%
Percentage of houses with at least one appliance device.	33%
Employment	
Population Economically Active (PEA) over 6 years old.	3,900
Males	2,819
Females	1,081
Economic Activity Rate of PEA over 15 years old.	63.50
Percentage of PEA over 15 years old working	
In Agriculture	89.00
In Services	8.70
Salaried	23.40
Level of Life	
Population below the line of poverty	74%
Population below the line of extreme poverty	44%

Source: Summary Statistic Social-economic of the Department of Loreto 2002. National Institute of Statistic and Informatic. Lima, Peru

The main economic activities of the area are the agriculture of survival (rice, yucca and banana) with very limited surpluses for trading, the selective and non-controlled wood extraction in natural forests, the fishing and the artisan hunting, that altogether concentrates 89% of the population, besides the trading, the transportation and the attached services that occupies the remaining 11%.

Practically none of the almost 2,000 houses of Mazán have drinking water and drainage, and the electric power comes from a fuel-generator that gives service between 6:00 p.m. and 11:00 p.m. The operating costs and maintenance are covered by the users at the rate of 15 soles per house and 25 soles per business (US \$4 and US \$7, respectively.)

In regards to social services, the town has several primary schools and one high school where the children of the closest towns also attend. It also has a small center of health that gives attention to the surrounding population, with the ability to assist childbirth and minor problems, but with refrigeration limitations for vaccines and antidotes of ophidian (poison of snakes).

Finally, besides the local municipality, in Mazán there is a police station and a dependence of the Captaincy of Ports.

Accessibility

The importance of Mazán is due to its strategic location in the proximities of the confluence of the Napo River with the Amazon River, in a place where they come considerably close to each other. In this sector there is an asphalted sidewalk that crosses the narrow land portion that divides them, allowing this way to shorten the time of trip considerably between Mazán and Iquitos.

Before its construction, the only way to access the town from Iquitos was crossing the Amazon River and overcoming the Napo River from its confluence, in a journey that takes around 24 hours in ships of medium size. With the asphalted sidewalk, the journey is carried out in 1 hour, 50 minutes sailing in light boats for transportation of passengers with outboard engines of high power, from the piers of Punchauca, in Iquitos to the point of the Amazon River where the sidewalk begins, and 10 additional minutes on motorized

tricycles (three wheels) crossing the narrow land until the town of Mazán, in the shores of the Napo River.

This strategic location between the Napo and the Amazon Rivers and the opening of the fluvial - terrestrial transportation has allowed Mazan to become the center of the commercial mediation between the riverside rural communities of the Napo River and the city of Iquitos.

Mazán is also connected with Indiana, a place relatively similar but of more administrative range, through a second asphalted sidewalk of approximately 10-km of length that runs parallel to the river. The trip between one town to the other is made by walking, in motorcycle or in motorized tricycle (moto-taxi). The municipality estimates that there are around 40 of these vehicles that give transportation services of passengers and light loads between the two towns and between Mazán and the shipment point on the Amazon River, what reports a monthly income of about of 800 soles for toll concepts (\$230 approximately) that are used for the maintenance of the roads.

Port infrastructure

In order to support the flow of transportation in the Napo River, which is supposed to increase in the next years with the fluvial trading of Ecuador, Mazán has a fluvial pier formed by a floating platform of 28.50 meters of length and 4.50 meters of wide, on top of which a crane of 2 tons of loading capacity has been placed, connected to the land by a fixed metallic bridge of 26 meters of length and 2 meters of wide. It also has a space of maneuvers of 140 m². This pier is designed to assist ships of up to 60 tons of loading capacity and for a movement of up to 50,000 tons a year. The operation and administration of the pier is under the responsibility of the local Municipality.

2. General Characteristics of Paraíso

Location, population, economy and social services

Paraiso is a small rural settlement made of about 50 houses, located on the shore of the Napo River and at a short distance of Mazán (30 to 40 minutes in canoe or 10 minutes in *peque-peques*). This location is a good example of the type of rural establishments that

are along the rivers of the Peruvian amazon, although in this particular case has the advantage of the localization in the periphery of Mazán.

The place is inhabited by around 250 families, whose main activities are the small agriculture of survival (yucca, banana, and rice), the fishing and the selective wood extraction. According to the interviews carried out in the community, the average of revenues of each family is from S/100 to S/140 soles monthly (about \$30 - \$40) coming from the sale of its productive surpluses.

The agricultural properties are relatively small (approx. 2.5 hectares) and around half of them are cultivated. The yucca (6.3 tons/year), the banana (5.3 tons/year) and the corn (4 tons/year) are the main products in production volume, and along with the fish (0.26 tons/year) and the hunting meat (0.03 tons/year) are mainly designated to the self-consumption, while the rice, which is produced in very small quantities, is the main product for trading.

The houses, formed by 3 rooms in an area of 60 m² approx., are built entirely from wooden boards over piles of trunks and with roofs of palm leaves. They don't have any type of domestic services (water, drainage, and electric power.) The population uses batteries to cover her basic necessities of illumination and, recently ITDG has installed prototypes of battery chargers using the current of the river, which has allowed to generate some incomes to the community from the service of battery charging that is given to the surrounding populations.

The town has a small primary school assisted by two teachers and a service for first aids in charge of two trained neighbors and supervised by the Ministry of Health's personal. The main diseases are related to the endemic malaria, malnutrition and stomach problems.

Accessibility and port infrastructure

The access to Paraiso is made exclusively by fluvial way. A small net of pedestrian paths that go into the forest also exists, used by men, women and children to go to the farms to bring firewood, wood and the harvest, and for hunting. The town doesn't have any port infrastructure.

Photo 15

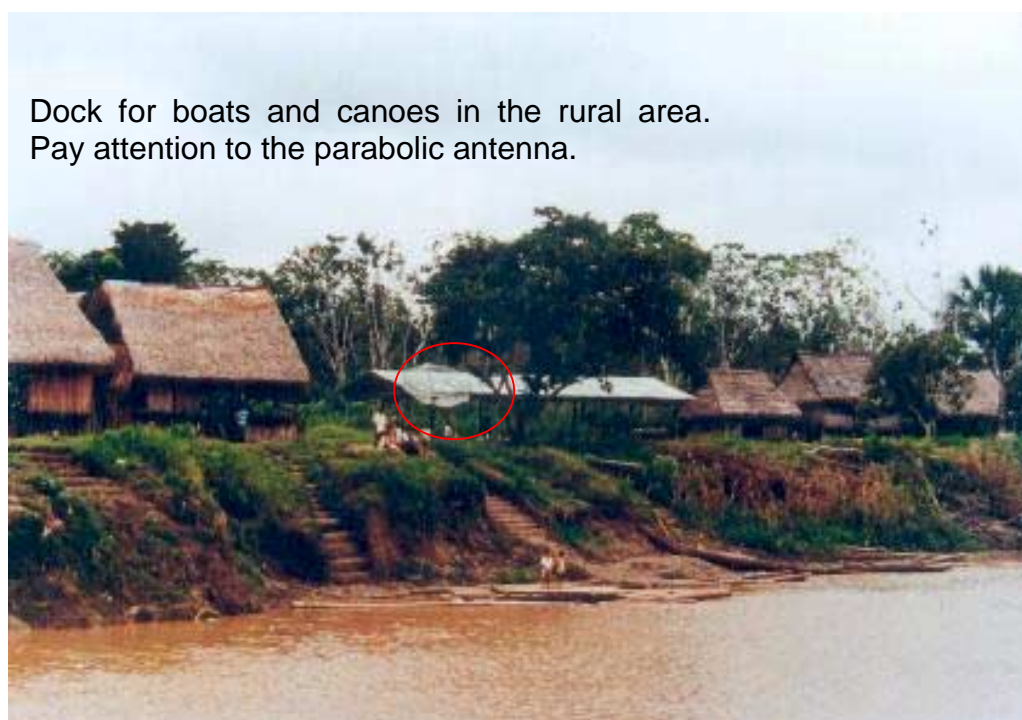


Foto: Colin Palmer

3. River transport needs

In Mazán and Paraiso, the river transportation is a key factor for almost all the activities of the communal life. It is used by men, women and children to satisfy diverse necessities.

3.1. Local transfers

The first flow in the local transportation is related to the production and trading activities. Most of the men of both towns, and possibly women, use boats with peque-peque engines and canoes for fishing tasks, to move to the agricultural parcels, to transport their products to the community and the port of Mazán, and to access to the area that are far away to do the hunting and the wood extraction. In general these are the tasks that correspond to the males, all of them outside the house and the community, so they are the ones that use this crafts almost every day.

On the other hand, women that usually stay at home taking care of the children, of the smallest animals (hens, pigs, etc.) and of the communal activities, use the canoes once or

twice a week in order to look for wood, services (supply, communications, health, processes and management, etc.). And the adolescents that go to high school in Mazán use the canoes to cross the river at least twice a day.

In general, the interviewers consider the transportation in small scale is not an important limitation for their economic and social activities, because their productive structures are not oriented to the generation of more commercial surpluses, because their way of life are isolated and self sufficient.

In a general way, the river transportation is also used by the population to move to neighbor towns, either to visit relatives, to participate in the local parties or to attend the very frequent soccer championships in the amazon, and also to access to the connections with the transportation services toward towns outside the area.

In general, all the interviewed people agree in pointing out that the accidents in the river transportation are not frequent, and they are limited to eventual tilts of canoes driven by not very expert people, and in any case with fatal consequences. This is because people learn how to use the canoes and *peque-peques* very young: in the same way that children of the cities learn how to use the bicycles, but also because smallest crafts usually navigate very near to the shore of the river to avoid the strong flow in the center of the river, so any accident is solved easily.

3.2. External transfers

As it has already been said previously, the river transportation is the only mean of transportation in the area for transfers from and toward the exterior. We have also said that Mazán constitutes the connection point among the river transportation that operates along the Napo River and the one that goes to the city of Iquitos.

A first type of demand for the river transportation toward the exterior of the area of study is constituted by the necessity of all the people that live along the Napo River of moving from and toward the city of Iquitos. The main reasons of the trips are in connection with the sale and the supply of products in that city and with the access to specialized social services (health, education and training.) Other reasons of smaller frequency have to do

with the employment search (eventual or permanent), with the execution of official procedures (particularly in the case of the authorities), with the visits to family and friends and, in the case of the personnel of the ministries and state dependencies, to get their paychecks.

A second type of demand is constituted by merchants of the area that circulate between Iquitos and the riverside communities of the Napo River, buying agricultural products and fish, and selling manufactured products that they bring from the city. Since this mediation can elevate considerably the prices of the products sold by the merchants, many families of the area choose to ask the persons that gives public transportation services in the public transportation crafts that circulate for the river to do their shopping.

4. River transport offer

4.1. Private transport

In Mazán a considerable quantity of private crafts exists. Most of them are canoes impelled by paddle, although there are also boats with engines, *peque-peque* and outboard used mostly by the wooden extractors to mobilize their personnel.

On the other hand, Paraiso does not count with motorized crafts. The only one that they had was donated to the community by national authorities during some electoral campaign; it was a wooden boat with *peque-peque* engine administered by the municipal agent to give transportation services to Mazán. However, six months ago, this craft is paralyzed because the community doesn't have the enough resources to repair the engine.

In this town exist around 15 canoes for a total of 50 families. Those that don't have one usually borrowed it from their neighbors or they rent them in exchange for fish or another product of basic consumption. According to the residents, the canoe does not constitute a sign of wealth or a decisive factor in the generation of incomes. They simply consider them as tools that give independence of movement.

4.2. Public transportation services

The commercial services of river transportation that operate in Mazán differ according to the destination of the trip. The short transfers toward closer towns (of 2 at 3 hours of sailing) are done in small boats, possibly canoes, impelled with peque-peque engines. The four or five boats that give this service from Mazán don't have an itinerary or a regular frequency, so they begin the trip once enough passengers have gathered to ensure a minimum profit in each transfer. The rate until Paraiso is of S/1 soles per person, and to the town of Indiana, S/3 soles per person. The interviewed people indicated that each boat does around 3 to 4 trips every day transporting 8 passengers on average every time.

The transfers of medium and long distance for the Napo River (up to 2 and 3 days of trip) are done in medium crafts, some of up to 20 tons, generally impelled with outboard motors of 75 HP on average or with diesel motors of more power. The five crafts that give the service of load and passengers transportation along the Napo River do not have itineraries and regular frequencies, and the rates vary according to the passenger's destination. On the average, each one of them transports from 20 to 30 passengers and they do a trip per day.

Lastly, the transfers toward the city of Iquitos by the Amazon River are carried out in slides or in impelled wooden boats with outboard motors of 100 HP on average. These crafts that give services of transportation of light load and passengers, operate from the city of Iquitos to diverse far away destinations, so Mazán (that is to say, the end of the sidewalk that unites it with the Amazon River) constitutes a station in their journeys. A considerable quantity of public transportation crafts that go by this point exist, so the flow is constant and the time of wait is relatively short.

4.3. Offer of crafts

In Mazán and Paraiso there are several people with experience in the production of boats and canoes.

Marcos, a resident of Paraiso, affirms that he builds around 10 crafts a year, ordered by people from the town and from other communities. The construction of a canoe takes between 5 and 7 days, whenever the appropriate wood is available. This seems to be a critical point, because he affirms that every time he has to go into more distant areas of the forest to find the requested wood. Frequently the work includes the location and cutting of the tree and the transfer from the trunk to the community. He gets paid S/. 40 for his services for a canoe of 4 meters and S / 90 for one of 6 meters, and this obviously does not include the cost of the utilized materials: tools, nails, tacks, oakum (vegetable fiber) and tar.

4.4. Offer of spare parts and maintenance services.

In Mazán commercial stores dedicated to the sale of engines do not exist. Eventually, it is possible to acquire them of second hand in private places. On the other hand, it is possible to acquire some basic spare parts for peque-peque engines, like propellers, connecting rods and spark plugs, as well as fuel and oils.

Photo 16



Foto: Colin Palmer

In Mazán there are several empiric mechanics that make simple repairs of peque-peque engines. However, the lack of electric power in the town constitutes a considerable limitation to make repairs of more complexity. The users don't consider that this lack of local technical capacities is a critical problem to the local transportation, because they go a lot to the shops of the port of Belen, in Iquitos, at one hour of distance.

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Addenda

GUIA DE ENTREVISTAS DE CAMPO

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6. MPM.
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10. Propietarios de CANOAS a remo. Dos (2) entrevistas.

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12. Casa comercial de embarcaciones. Una (1) entrevista. Oferta de embarcaciones motorizadas.
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16. Fabricantes de piezas (tornos – fundiciones). Dos (2) entrevistas.

MAZÁN

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19. Propietarios de canoas a remos. Tres (3) entrevistas.
20. Personas sin embarcaciones. Tres (3) entrevistas (1 mujer y 2 hombres)
21. Constructores artesanales: Dos (2) entrevistas. Oferta de botes y canoas.

A BORDO DE LANCHA

22. Patrón o Capitán de Lancha (Motonave). Una (1) entrevista a bordo.
23. Pasajeros en Lancha.

Información de interés en Mazán

- Ubicación geográfica.
- Accesibilidad desde Iquitos: alternativas, tiempos de desplazamientos, medios de transporte, costos de viaje, etc.
- Articulaciones con otras localidades.
- Descripción de la localidad: morfología, tipo de viviendas, energía, luz doméstica y pública, agua potable y desagüe.
- Población: total, por género, por edades, por número de familias.
- Caracterización de la economía familiar típica: agricultura, pesca, comercio, etc.
- Comercio: productos de salida, productos de entrada. Sistema de comercio.
- Acceso a servicios sociales básicos: educación; salud; información; gobierno local.
- Características de infraestructura portuaria.
- Venta de combustibles: cuáles, precios, demanda.
- Mecánicos locales: cuántos, capacidades, tipo de demanda, problemas principales.
- Constructores artesanales.
- Administración local del transporte fluvial: ¿existe formalmente? ¿Cómo resuelven problemas de organización y mantenimiento de infraestructura? ¿Alguien regula servicios comerciales de transporte? .
- Relaciones con organismos públicos de administración del transporte fluvial (Capitanía, Dirección de Transporte Fluvial, Enapu, etc.)
- Organizaciones locales relativos al transporte fluvial. Tipo de organizaciones, funciones que realizan. Historia, balance y problemas principales.
- Parque de embarcaciones locales: cantidad, características de embarcaciones y propulsores. Tipo de propietarios.
- Usos de embarcaciones locales: destinos frecuentes, costos de desplazamientos y mantenimientos, personas que usan embarcaciones. Limitaciones y problemas.
- Servicios comerciales de transporte fluvial y terrestre. Tipo de servicios, frecuencias, costos. Limitaciones y problemas.
- Accidentes en transporte fluvial: tipo de accidentes, frecuencia, manejo de accidentes.
- Proyectos, iniciativas y sugerencias relativos al transporte fluvial.

Empresa Nacional de Puertos - ENAPU.

- Funciones y competencias.
- Relación con el Ministerio de Transportes.
- Grado de autonomía en las decisiones.
- Ingresos propios vs. Ingresos por transferencias.
- ¿Qué tipo de relación mantiene con otras instituciones públicas encargadas de la administración del transporte fluvial? Capitanía de Puerto, Dir. Regional de Transporte Acuático, otros.
- Problemas detectados, iniciativas, proyectos, sugerencias.

- ¿Qué puertos amazónicos están bajo responsabilidad de ENAPU?
- ¿Quién administra los otros puertos y embarcaderos de la región?

- ¿Cuáles son las características del puerto de Iquitos? Infraestructura, equipos, personal.
- ¿Qué tipo de embarcaciones utilizan las instalaciones a cargo de ENAPU? ¿Con qué frecuencia?
- ¿Qué servicios ofrecen a los usuarios y cuánto cobran por ellos?
- ¿Cuáles son los principales problemas del Puerto de Iquitos?
- Estadísticas de carga en Puerto de Iquitos.

Capitanía de Puerto de Iquitos:

- Funciones y competencias.
- Relación con el Marina de Guerra;
- Grado de autonomía en decisiones,
- Ingresos propios vs. Ingresos por transferencias.
- ¿Qué tipo de relación mantiene con otras instituciones públicas encargadas de la administración del transporte fluvial? Capitanía de Puerto, Dir. Regional de Transporte Acuático, otros.
- Problemas detectados, iniciativas, proyectos, sugerencias.

- Radio de acción (¿Atienen otros puertos y embarcaderos?).
- Servicios y tarifas cobradas.
- Labor que ejecutan (características, periodicidad).
- Capacidades a disposición: infraestructura, equipos, personal.
- Problemas y limitaciones percibidos.
- Perspectivas y proyectos.

- Cuadro de Embarcaciones registradas.
- Comparación en tres momentos: 2002, 1991, 1981.
- Características básicas de embarcaciones registradas para tipología (ver Cuadro de Tipología)

- ¿Qué transportan las embarcaciones de carga pesada? Tipo de productos mayoritariamente transportados.
- ¿Cuánto transportan? Volumen de carga estibada en Iquitos.

- ¿Quiénes demandan servicios de transporte de carga pesada? Principales clientes que usan servicios de carga.
- ¿Adónde van? Principales puntos de origen y destino.
- ¿Cuánto cuesta? Precios unitarios de carga por distancia o tipo de producto.
- Problemas, limitaciones, tendencias.

- Descripción del sistema de comercio fluvial.
- Modo de operación y economía de los comerciantes.
- Tipo y características de embarcaciones utilizadas.
- Radio de operación.
- Percepción de usuarios (compradores y proveedores) respecto a comerciantes.

Dirección Regional de Transporte Acuático

- Funciones y competencias;
- Relación con el Ministerio de Transportes;
- Grado de autonomía en decisiones, generación de ingresos y gastos.
- Radio de acción (¿Atienen otros puertos y embarcaderos?)
- Servicios y tarifas cobradas.
- Labor que ejecutan (características, periodicidad).
- Capacidades a disposición: infraestructura, equipos, personal.
- Problemas y limitaciones percibidos.
- Perspectivas y proyectos.

Asociación de Armadores

- ¿Qué es y para qué se fundó la Asociación? ¿Desde cuándo?
- ¿Qué rol desempeña?
- ¿Qué servicios ofrece a sus asociados?
- ¿Cuántos asociados hoy en día? ¿Son personas naturales y/o empresas? ¿Antes habían mas o menos asociados?
- ¿Qué requisitos para ser asociado?
- ¿Existen asociados de otras localidades?
- ¿Qué tipo de actividades realizan los armadores? (Carga, pasajeros, alquiler embarcaciones, turismo, etc.)

- ¿Cuántas embarcaciones y de qué tipo están cubiertas por la Asociación de Armadores?
- ¿Aumenta o disminuye el número de embarcaciones? ¿Por qué?
- ¿Dónde y cómo se adquieren las embarcaciones?

- ¿Qué relación mantienen con autoridades públicas? (ENAPU, Capitanía, Dir. Reg. Transporte Acuático, MTC, Comercio, Industria, Aduanas, Banca de financiamiento, etc.).
- Percepción de problemas, limitaciones y tendencias del transporte fluvial (Mercado, administración, financiamiento, mantenimiento, etc.). Principales demandas, proyectos y perspectivas a futuro.

- ¿Qué transportan? Tipo de productos mayoritariamente transportados.
- ¿Cuánto transportan? Volumen de carga estibada en Iquitos.
- ¿Quiénes demandan servicios de transporte de carga pesada? Principales clientes que usan servicios de carga.
- ¿Adónde van? Principales puntos de origen y destino.
- ¿Cuánto cuesta? Precios unitarios de carga por distancia o tipo de producto.
- Problemas, limitaciones, tendencias.
- Instituciones locales de formación técnica en construcción de embarcaciones y mantenimiento de motores de propulsión acuática.

Municipalidad Provincial de Maynas (Iquitos)

- ¿Existe una Dirección de Transporte Acuático u otra dependencia municipal que se relacione con el transporte fluvial?
- Funciones y competencias;
- Relaciones con otros organismos públicos (MTC, Marina, CTAR, etc.)
- Radio de acción (¿Atienen otros puertos y embarcaderos?)
- Servicios y tarifas cobradas.
- Labor que ejecutan (características, periodicidad).
- Capacidades a disposición: infraestructura, equipos, personal.
- Problemas y limitaciones percibidos.
- Perspectivas y proyectos.

Alcalde de Mazán

- Historia de la localidad.
- Población.
- Economía local: producción, comercio, otros servicios.
- Ingresos y consumo de las familias.
- Servicios sociales: educación, salud, gobierno, etc.
- Servicios de transporte externo que atienden a la localidad.
- Percepción de la comunidad respecto a servicios de transporte fluvial.

- Cantidad y tipo de embarcaciones existentes en la localidad.
- Principales problemas y limitaciones del transporte local.
- ¿Quiénes se trasladan?
- ¿Adónde se trasladan?
- ¿Cuánto tiempo demoran los traslados?
- ¿Cuándo se trasladan?
- ¿Para qué se trasladan?
- ¿Cómo se trasladan?
- ¿Cuánto cuesta el traslado?
- Experiencias de servicios locales de transporte.

- Competencias y funciones de la municipalidad relacionadas al transporte fluvial. Control y registros. Capacidad de acción en transporte fluvial. Infraestructura fluvial. Administración, mantenimiento, cobros, problemas, proyectos, etc.
- Demandas, ideas, proyectos relativos al transporte.

- Comercio de bienes a través del transporte. Descripción del sistema, modo de operación, economía de comerciantes, radio de acción. Percepción de usuarios.

Servicios de transporte fluvial

Demanda

- Características de usuarios que demanda regularmente servicios comerciales de transporte de carga y pasajeros desde Iquitos en embarcaciones medianas. (¿Quiénes se trasladan?).
- Principales rutas y destinos (a dónde van desde Iquitos) de mayor demanda, frecuencia, tipo de carga, variaciones estacionales de la demanda y tiempos de desplazamientos.
- Principales motivos por los cuales se trasladan los pasajeros (¿para qué se trasladan?).
- Percepción de usuarios respecto a calidad del servicio ofrecido.

Oferta

- Características de empresas y embarcaciones que prestan servicios comerciales de transporte de carga y pasajeros que salen y llegan al puerto principal de Iquitos al día / semana / mes / año. Modalidades del servicio, intermediaciones, costos, economía del transportista.
- Estimación de pasajeros y carga transportados al año.
- Condiciones del servicio prestado: regularidad, seguridad, horarios, comodidad, información.
- Precios promedios al público por distancia según pasajeros y carga.
- Estimación de costos de operación y punto de equilibrio.
- Tiempos de desplazamiento.
- Requisitos y condiciones exigidas por las autoridades a los prestadores de servicios de transporte mixto: registros, autorización de zarpe, condiciones de seguridad, etc.

Entrevista con Patrón o Capitán de Lancha (Motonave)

Demanda

- Tipo de clientes que alquilan medios de transporte.
- Usos predominantes de medios de transportes alquilados.
- Tamaño de la demanda.
- Percepción de usuarios y sugerencias.

Oferta

- Tipo de medios intermedios de transporte de alquiler.
- Tamaño de la oferta de alquiler de medios de transporte.
- Condiciones de alquileres.
- Precios.

Proprietarios de bote-motor privado FUERA DE BORDA.

- Tipo de embarcación y motor utilizado. Marca y potencia.
- ¿Qué combustible utiliza? ¿Dónde suele comprarlo? ¿Qué diferencia de precio hay fuera de Iquitos?
- ¿Hace cuánto que los tiene?
- ¿Qué uso le da? Destinos (distancias, tiempo) y frecuencia de uso.
- ¿Qué percepción tiene sobre la calidad de su motor?
- ¿Cuáles son los principales problemas de mantenimiento del bote y del motor?
- ¿Qué repuestos del motor compra con más frecuencia?
- ¿Cada cuánto tiempo?
- ¿Dónde los compra?
- ¿Cuánto paga por ellos? ¿Le parece que los precios son razonables?
- ¿Adónde acude para repararlo? ¿Estimación de gastos promedios por tipo de reparación?
- ¿Qué percepción tiene de la calidad de los talleres de mantenimiento?
- ¿Qué rendimiento tiene? Galones de combustible por tiempo / distancia.
- ¿Cuánto gasta en la operación y mantenimiento del motor al mes?
- ¿Está satisfecho (contento) de su bote y su motor? Piensa cambiar de bote y/o de motor?

Proprietarios de bote-motor privado PEQUEPEQUE.

- Tipo de embarcación y motor utilizado. Marca y potencia.
- ¿Qué combustible utiliza? ¿Dónde suele comprarlo? ¿Qué diferencia de precio hay fuera de Iquitos?
- ¿Hace cuánto que los tiene?
- ¿Qué uso le da? Destinos (distancias, tiempo) y frecuencia de uso.
- ¿Qué percepción tiene sobre la calidad de su motor?
- ¿Cuáles son los principales problemas de mantenimiento del bote y del motor?
- ¿Qué repuestos del motor compra con más frecuencia?
- ¿Cada cuánto tiempo?
- ¿Dónde los compra?
- ¿Cuánto paga por ellos? ¿Le parece que los precios son razonables?
- ¿Adónde acude para repararlo? ¿Estimación de gastos promedios por tipo de reparación?
- ¿Qué percepción tiene de la calidad de los talleres de mantenimiento?
- ¿Qué rendimiento tiene? Galones de combustible por tiempo / distancia.
- ¿Cuánto gasta en la operación y mantenimiento del motor al mes?
- ¿Está satisfecho (contento) de su bote y su motor? Piensa cambiar de bote y/o de motor?

Constructores artesanales

- ¿Qué tipo de botes / canoas fabrica. Dimensiones, usos, características.
- ¿A qué precio los vende? ¿Al contado, a plazos o en especie?
- ¿Cuánto dinero gasta en la construcción? (Madera, clavos, etc.)
- ¿Cuánto tiempo le toma construirlos?
- ¿Qué tiempo de vida promedio tienen los botes?

- ¿Fabrica a pedido o tiene stock?
- ¿Cuántos pedidos de fabricación en promedio al mes / año?
- ¿Qué tipos de botes son los más solicitados?
- ¿Quién se los solicita? ¿Hasta donde llega su mercado?
- ¿Tiene competencia? ¿Hay muchos armadores artesanales?

- ¿Qué maderas utiliza ahora y cuáles utilizaba antes? ¿por qué hay cambios?
- ¿Qué herramientas y equipos utiliza? Limitaciones y problemas frecuentes.
- ¿Repara embarcaciones? Si lo hace: ¿Qué tipo de reparaciones más frecuentes? ¿Con qué frecuencia? Si no lo hace: ¿dónde se reparan las embarcaciones?

- ¿Hace cuánto tiempo se dedica a esto?
- ¿Quién se lo enseñó el oficio?
- ¿Con quién trabaja y a quién le enseña el oficio?
- ¿Es una actividad permanente o eventual? Si es eventual ¿por qué lo hace? ¿Cuánto le reporta en dinero? ¿Tiene otros ingresos?
- Instituciones locales de formación técnica en construcción de embarcaciones y mantenimiento de motores de propulsión acuática.

Casa comercial de venta de embarcaciones en Iquitos.

- ¿Qué tipo de embarcaciones venden? Características.
- ¿Qué precios de mercado?
- ¿Cuáles son los modelos más solicitados?
- ¿Cuántos venden en promedio mes / año?
- ¿Quiénes compran?
- Formas de pago.
- ¿De dónde provienen las embarcaciones?
- ¿Cómo ha evolucionado el mercado de embarcaciones en los últimos años?
- Competencia.
- Percepción de problemas, limitaciones y tendencias del negocio de embarcaciones.

Casas comerciales de motores

- Tipo de motores que venden: Fuera de Borda – Long Tail (Peque-peque)
- Marcas de motores.
- ¿Cuáles son los más demandados? ¿por qué?
- ¿Quiénes compran motores?
- Formas de pago (contado / crédito)
- ¿Cuántos venden al mes / año en promedio?
- ¿Cómo ha evolucionado el mercado de motores en los últimos años? Competencia.
- Percepción de problemas, limitaciones y tendencias del negocio de motores.

Vendedores de repuestos de motores.

- ¿Qué repuestos son los más solicitados para motores FB y PqPq?
- ¿Cuánto vende en promedio mensual de los más demandados?
- ¿Cuánto cuestan y diferencia de precios según origen?
- ¿De dónde provienen los repuestos? ¿Originales importados, nacionales o fabricados localmente? Características y vida útil.
- ¿Dónde compra la mercadería? Mayoristas, fabricantes, importa directamente.
- ¿Existe mucha competencia de venta de repuestos en la localidad?

Talleres de mantenimiento de motores

Visita a zona cercana al puerto principal donde operan varios talleres de mecánica.

- Tipo de motores que reparan. Cantidad promedio mensual.
- Tipo de reparaciones más frecuentes.
- Precios promedios.
- Tipo de cliente que atienden y procedencia.
- Servicio a áreas rurales.
- Instituciones locales de formación técnica en construcción de embarcaciones y mantenimiento de motores de propulsión acuática.

Talleres fabricantes de repuestos para motores

Visita a talleres – torno o fundiciones en calle Ramírez Hurtado fabricantes de piezas.

- ¿Qué tipo de piezas fabrican?: Hélices, pistones, anillos, cilindros, otros.
- ¿Cuántas piezas de cada tipo fabrican al mes en promedio?
- ¿Qué materiales utilizan? ¿Dónde y a qué costos los obtienen?
- Precios de venta de principales piezas fabricadas.
- Instituciones locales de formación técnica en construcción de embarcaciones y mantenimiento de motores de propulsión acuática.

Ficha de características de motores ofertados

Tienda Comercial entrevistada:

Fecha de entrevista:

Tipo de Motor	Marca	Potencia	Precio	Combustible	Tipo de hélice	Rendimiento Km x galón	Vida útil	Observaciones	
Fuera de Borda	Johnson	15							
		25							
		40							
		55							
		65							
		100							
	Yamaha	15							
		25							
		40							
		60							
	Suzuki	25							
	Mariner								
Evinrude									
Honda									
Mercury									
<i>Long Tail Peque-peque</i>	<i>Briggs & Stratton</i>	9							
		12							
		16							
	<i>Chino</i>	9							

CUADRO DE TIPOLOGÍA DE EMBARCACIONES DE CARGA Y PASAJEROS

Tipo de embarcación	# Barcos registrados	Capacidad de carga	Características básicas de la embarcación	Radio de acción	Usos
Empujador Fluvial (EF).					
Remolcador Fluvial.					
Chata. Artefacto Fluvial (AF).					
Albarenga.					
Barcaza.					
Moto-chata.					
Moto-nave o "Lancha". Moto Fluvial (MF).					
Bote-motor uso comercial. "Colectivos". Bote Fluvial (BF).	¿?	2.5 a 10 toneladas	Embarcaciones de madera. Eslora de 14.5 metros (rango de 11 – 19), y manga de 2.5 metros (rango de 1.5 – 3.2). Vida útil promedio de 5 años (rango de 3 – 8). Emplean techos a dos aguas de material vegetal. Propulsados con motores F/B.		Transporte de carga y pasajeros. Transporte de correspondencia y encomiendas. Recreación. Turismo y salud.
Bote-motor uso privado.	¿?	3 toneladas	Embarcaciones de madera. Eslora de 8 metros y manga de 1.5 metros. Construidos con modalidad de "fundición" o "encalfado" (base de madera que es el fondo del caso, se agregan proa, cuadernas y falcas (1 ½") de acuerdo a la altura deseada de la embarcación. En la popa se coloca el espejo para motor F/B o tabla de madera para motor pequepeque. Finalmente las uniones se sellan con brea para evitar el ingreso de agua. Utiliza motores fuera de borda o motores industriales adaptados a la navegación acoplándole una cola larga ("Long tail" o "Pequepeque"). No llevan techo.	Hasta 150 kilómetros dependiendo del tipo de motor utilizado.	Presta servicios de transporte de carga a sus propietarios. Se estima que el 60% de las embarcaciones menores motorizadas utilizan pequepeques. Su poco calado les permite llegar a lugares inaccesibles para un F/B. Esto, sumado al bajo consumo de gasolina y al bajo costo inicial, lo convierte en la alternativa de transporte más viable para la población de escasos recursos.

Balsa	¿?	3 – 5 toneladas.	Estructuras flotantes construidas con troncos de “madera balsa” y atados con “Tamishe”. Propulsión a remos y uso de la corriente fluvial. Lentas, económicas, estables y versátiles. Vida útil: ¿?		Se emplean con frecuencia para el transporte de madera rolliza para construcción de viviendas.
Canoa.	¿?	200 kilos.	Embarcaciones pequeñas de madera (Cedro y Catahua). Eslora de 3 metros y manga de 1 metro promedio. Construidas mayoritariamente con modalidad de fundición (troncos cavados longitudinalmente y abiertos a lo ancho por medio de calor). Propulsión a remos. Lentas, poca capacidad de carga, buena maniobrabilidad, riesgosas por inestabilidad. Vida útil ¿?.	Traslados cortos de hasta 30 kilómetros.	Es el tipo de embarcación más común en la región por su bajo costo de adquisición y mantenimiento. Suelen ser de uso particular. En comunidades rurales suelen ser el único medio de transporte al alcance de la población y son muy versátiles para la pesca y traslados a parcelas agrícolas: En áreas urbanas suelen ser usados por pequeños comerciantes ambulatorios.

Percepción de usuarios respecto a motores FB y PqPq.

Tipo de Entrevistado:

Tipo de motor que utiliza:

Fecha:

Tipo	Marcas	Ventajas	Desventajas
Fuera de Borda	Johnson, Evinrude, Yamaha, Mariner, Suzuki, Mercury		
Long Tail	Briggs & Stratton, Chino, Honda		
	Electrolux		

Combustibles y aceites

Observación de precios de combustibles y aceites en zonas urbanas y rurales.

Localidad	Combustible / Aceite	Tipo	Precio
Iquitos	Gasolina	84	
		90	
	Diesel		
	Kerosene		
	Aceite		
Medio camino	Gasolina	84	
		90	
	Diesel		
	Kerosene		
	Aceite		
Área rural	Gasolina	84	
		90	
	Diesel		
	Kerosene		
	Aceite		

BOAT OPERATING COSTS

(See excel sheet)