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STUDY OF THE RELEVANCE OF SELECTED ECOLOGICAL  
FACTORS RELATED TO WATER RESOURCES AND THE  
SOCIAL ORGANIZATION OF FISHERMEN VILLAGES  
IN PUERTO RICO

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## INTRODUCTION

In overpopulated countries like Puerto Rico, where the land-man ratio is considered to be low, the proper utilization of its land and its water resources is essential in order to provide its inhabitants enough food and many other commodities for attaining higher levels of living. The alarming rates of the world's population increase has recently more than ever called the attention of the economists who predict a severe food shortage unless proper measures are taken, for example, a more intensive exploitation of the sea resources.

Furthermore, it is not only an important asset for the tourist industry, but also for the men who earn their living on the sea. Thus, it is providing a high quality protein to the population to complement what the scarce land available is unable to produce.

Although there are very limited studies on the sea resources in Puerto Rico, Iñigo, Head of the Fishing and Wildlife Division of the Puerto Rico Department of Agriculture, states that the potentialities of this water resource has not yet been utilized at an optimum capacity.<sup>11</sup> During the year 1967, the value of imports of fish and fish preparations from the United States and foreign countries to Puerto Rico reached \$38 million dollars.<sup>7</sup> The amount of commercial sea fishing in the island has been increasing steadily. During

the 5 year period from 1959 to 1964, it increased from 5.5 million to 11 million pound per year with a market value for the fisherman during 1964 of \$3 million dollars<sup>9</sup>/

The implementation of government's programs for the better utilization of the sea as one of the most important water resources for a densely populated island, ought to give primary consideration to the people who are related in one way or the other to this munificent resource. To these people, are these government's programs addressed.

In Puerto Rico, most of the fishermen live in small villages scattered throughout those coastal areas where fish is more abundant. A knowledge of the cultural, social and individual conditions that influence the formation of the attitudes these people may have is not only essential for a successful diffusion of the programs, but also for the adoption of a new technology. Knowing how and why they behave the way they do, the obstacles that may hinder or the favorable conditions that most likely would advance the acceptance of new fishing practices can be discovered. Fishermen have, so far made very little use of the sea vast potentialities because they use very primitive and simple tools. Moreover, their fishing methods such as: sailing in small boats and fishing with very small nets enable them to fish only in nearby waters missing the highly populated banks in distant places. Fishermen in Puerto Rico seem not to be aware, or not to take care in protecting the females and the youngsters especially of the lobsters, crayfish and other crustaceans to insure the continuity and the multiplication of the species in nearby waters.

For all these reasons, they are unable to catch greater amounts of fish that could provide better incomes and better living conditions for their families if proper marketing outlets were available.

Fishermen in Puerto Rico are lagging in the social and economic betterment which most of the Puerto Ricans have already attained during the last years. It is expected that many of them turn to industrial jobs in the near future searching for better incomes. The younger, those with a better education, and with higher aspirations may tend to move at a faster rate as industry is mostly selective as to age and schooling. Fewer of the younger generation will select fishing as their occupation unless new methods insure them better incomes.

There is an excellent demand for the seafood in Puerto Rico as the increasing population with better incomes is able to pay good prices as the figures on imports of sea food have shown.

Those staying in the occupation will have to use modern technology in order to cope with the increasing demand. However, the olders, will cling to their obsolete-traditional methods.

Fishermen will have to start looking for new places where to fish because the coastal waters are increasingly becoming polluted by the industrial discharges which bring about the migration of sea fauna as has already been detected in some areas.

In Puerto Rico, studies and information about the fishing occupation and the fisherman is very limited. Very few sociological research has been carried out among the Puerto Ricans, and no sociological study on fishermen and their social organizations has been found.

It is expected that this exploratory research provide a basis for future studies that would detect the social changes that the fishermen may undergo due to the impact that the increasing population, urbanization and industrialization may have on them in Puerto Rico.



### THE PROBLEM

The commitment of the individual to the group norms and values has been one of the basic premises of sociological theories irrespective of the controversial issue or theoretical position or aspect advocated. Durkheim's admission of the reality of the social mind, what he called collective representations that exist outside of the individual which are endowed with a coercive power and which impose upon him the ways of acting, feeling and thinking of the group represents a typical premise of sociologistic school.<sup>5/</sup> Social facts in the form of patterned social interactions, the organization that makes possible these interactions and the processes that are a consequence of these human relationships constitute the focus of sociological studies or frame of reference.

The role of the social group in molding the character of the individual is pointed out by Cooley in his analysis of the primary group, characterized by intimate, face-to-face relations.<sup>3/</sup> Merton deals in his reference group theory not only with the conformity of the individual to group norms, but also with the influence exerted by those other groups which the individual utilizes as standards or which he expects or desires to belong to in the future.<sup>4/</sup> Inkeles's underlying theory in his analysis of the "Industrial Man", assumes that people have experiences, develop attitudes and values in response to the forces or pressures which their environment creates.<sup>16</sup> By environment, Inkeles means the

network of interpersonal relations and patterns of reward and punishment the person normally experiences from them. In other words, man's perceptions, attitudes and values are shaped by the network of interpersonal relations in which he is enmeshed, and particularly by the rewards and punishments that these relations might bring. Inkeles concern was mostly with the industrial system and the arousal of a sub-culture in response to the role structure of modern industrial society.

To what extent the sociological theory applies to the behavior of the fishermen in their interaction with their occupational group has not yet been determined. Very limited sociological research has been done in relation to fishermen's social systems. Studies of other occupational groups, class and caste systems, minority groups, juvenile gangs, slum dwellers and other sub-groups within a larger social system may yield valuable insights for the prediction of interactional patterns and social structure in this specific group of fishermen.

This study expected to gain some knowledge of the fishing occupation and to describe and explain some aspects of their social structure in the four main fishermen villages in southwestern Puerto Rico. It sought also an understanding of the adaptation of its inhabitants to the changing social and physical environments.

The main specific objectives of this study were the following:

To uncover differences, if any, between fishermen and

those engaged in other occupations, in such aspects as of level of living, fertility, education, religious affiliation and age.

To detect differences in these aspects between the four villages studied: Puerto Real, La Parguera, Playa Guayanilla and El Combate which may give some insights as to the influence that urbanization and industrialization may have in the behavioral patterns of its inhabitants.

To determine the relevance, if any, between education and fertility; occupation and fertility; level of living and fertility and level of living and education.

To gain some insights as to the aspirations of fishermen and their job satisfactions in an area of high pollution such as Playa Guayanilla, as compared with other areas where pollution seems not to constitute a serious problem and to detect their future plans as an adaptation to the changing environmental conditions.

It is the aim of this study to establish a basis for future research in which changes could be detected over a period of time. It is expected that the information gathered in this study be valuable in understanding fishermen behavior which is essential in the establishment of government's programs and policies directed to help them to attain more productivity from their occupation. The data presented in this study may also be useful in comparing these fishermen villages not only with other villages or areas in Puerto Rico where many other occupations, either agricultural or industrial may prevail, but also with many other fishermen villages located in other regions of Puerto Rico.

## REVIEW OF LITERATURE

Sociological functionalist theory considers the status role as their unit of study. The member of the social system while acting the roles pertaining to the different positions he occupies in the society, behaves in the way that the group has established as the most convenient for the survival and the goal attainment of that social system.

The roles an individual plays in the different positions he occupies, has been molded by the physical and social environment that have been impinging upon the group. Out of the group experiences arise a process of piling up those ways of thinking, feeling and acting that seems to be more adapted to the environmental conditions that are able to satisfy, in a greater degree the material and social demands of the group. These ways of thinking, feeling and acting that are a part of the group culture, constitute the role in a specific position. This role is assimilated or internalized into the individual compelling him to behave in a specific way, and influencing somehow in his behavior while engaged in other social positions within the society. The society, for example, expects a judge or a professor to behave with circumspection and seriousness even outside the court or the university when they are not in their occupational positions.

As the occupation is the status role in which, generally, the individual is engaged for a longer period of his daily life, it can be understood why it comes to influence the behavior of the individual in different situations, in different

status-roles and in different groups.

Research carried out in the fields of population fertility, social participation and social stratification among others, have shown that there is a tendency for those persons occupying a similar category of occupations from non-skilled workers to professionals, to show certain similarities such as place of residence, living conditions, fertility, frequency and characteristics of their social relationships, social participation and acceptance of innovations.

Studies by Inkeles carried out among different cultures showed that persons in the same category of work tend to think, perceive and have similar attitudes about different problems and life situations presented to them regardless their cultural background. The fact of being an unskilled worker will determine that he behaves more like the unskilled worker of other cultures rather than other categories of worker within his own culture.<sup>10</sup>

Marx posed that the economic factor is the fundamental determinant of the society structure and development. The economic factor which is composed mainly by the technological means of production determine the social organization of production. The ways and methods by which men in a given society produce their means of subsistence and interchange their products determine the nature of its institutions. This is the essence of the economic determination theory of Marx which indicates that the political organization, law, religion, philosophy, art, literature, science and morality in a given society is mainly determined by the economic factor.<sup>12</sup>

The interest of the social scientist in studying the influence of the physical environment upon the culture, the social organization, the human behavior and the social processes can be observed in many of the writings of the early social philosophers. At the end of the last century and at the beginning of the present century, historians, sociologists, anthropologists, economists, social philosophers, ethnographers and many other social scientists have developed a great number of theories trying to determine and test out the influence of geographical factors in nearly every social phenomena; namely, the social organization, the social processes, and the culture. A great majority of these geographical deterministic theories lack scientific validity, the influence of these geographic factors not always being equally rigid or direct in different social phenomena.

Robert Park, one of the pioneers of the human ecology school that quickly developed after his Chicago studies, points out that people with similar economic and cultural characteristics tend to concentrate in specific zones of the city and that the social and cultural characteristics of each specific zone within the city tend to impose upon the lives of the inhabitants.<sup>4</sup> In some of the works that followed from Park the role of the social environment has been exaggerated so much as to point it out as the main determinant of human behavior.

After Mac Iver's *Community: A Sociological Study* which places emphasis in the relations of the community to territorial location. Parsons defines community as "that aspect

of the structure of social systems which is referable to the territorial location of persons and their activities"<sup>15</sup> Although Parsons is not an advocate of geographical determination, he is concerned with what role categories of social structure are most relevant to the relations between the population and the territorial location, the categories of meaning of territorial location to persons in roles, and how all these are related to each other. The place where the person of reference is to be located must be taken into consideration and this place need not be the same for any two different roles in which he is involved. The occupational or work reference may involve more emphasis on the environment because orientation to the environment is very important where adaptive functions are in use.

### METHODOLOGY

Four villages at the south-western coastal area of Puerto Rico were selected for this study among those showing the greatest fishermen population. This is an area of high fish production where many of the studies of the Marine Biology Department of the University of Puerto Rico are carried out. At Punta Guanajibo, close to Mayaguez, fishing research laboratories sponsored by the State Department of Agriculture and the U.S. Department of Interior will start operation during this year.

One of the villages selected, Puerto Real, is located close to Cabo Rojo, a city at the south western coast of Puerto Rico. El Combate, about 16 miles from Cabo Rojo, is an isolated village where the influence of urbanization and industrialization may not be as high as in Puerto Real. La Parguera is a tourist resort and the site of the Marine Biology Department laboratories where the presence of these outsiders was thought to affect the behavioral patterns of the villagers. Playa Guayanilla is close to a Petro-Chemical industrial complex about 18 miles from the city of Ponce. Chemical discharges from these industries have heavily polluted its bay stirring up great interest in research activities regarding water contamination and the public awareness in the dangers for the flora and fauna of all the surrounding waters of the island.

The data for the present study was gathered by means of



personal interviews, observations and information published by the Division of Fishing and Wildlife of the Commonwealth Department of Agriculture.

A questionnaire was prepared to gather information about living conditions, schooling, occupation, fertility, religion and migration to the States of both fishermen and those engaged in other occupations (See Appendix #2). A level of living scale was constructed following Belcher's cross-cultural level of living scale which has been used in a sugar cane, in a coffee and in a tobacco farming area of Puerto Rico. It was also used in Camden County, Georgia.<sup>2</sup> Belcher's scale that is correlated significantly to already existing ones is based on material possessions and includes the following items: construction material used for the house walls, roof and floor, floor covering in the living room, number of rooms in the house per person, location of the kitchen, cooking facilities, source of water, preservation of perishables and transportation. Each item in the scale was graded from what was considered to be more adequate, efficient, and expensive, to the less, then, a value was given accordingly; to the most efficient, the highest values were given.

In the construction of the level of living scale for this study, fifteen items were taken into consideration:

- (1) construction material of the house walls,
- (2) construction material of the roof,
- (3) construction material of the floors,
- (4) living room floor coverings,
- (5) number of persons per room,

(6) construction of kitchen walls, (7) kind of stove, (8) kind of kitchen cabinets, (9) electricity at the house, (10) kind of refrigerator, (11) dishwashing equipment, (12) means of transportation, (13) water supply, (14) toilet facilities and (15) bathing facilities.

In this scale, the most desirable condition within each item was granted one point. The less desirable conditions were granted successive number of points according to the degree of desirability. The households having the less number of points, had the highest living conditions according to this scale, being 15 the least number of points that could be obtained, and therefore, they might occupy the highest position. Comparisons were made among fishermen and those in other occupations in the same village. Then they were compared with similar occupational groups in other villages.

In Puerto Real, which is the highly populated of all the communities studied, a total of 346 interviews were made where 54 fishermen were house heads. Information from the whole universe was tried with a first visit to the house, but if the head of the household or spouse was not present, a second intent was made only if the head was a fisherman, as a reliable sample was desired for this group which constituted the main interest in the study.

At La Parguera village, the cluster technique of sampling was used. By using a map of the community, clusters of 10 houses were formed, and a random sample of one cluster out of every four was selected. Each family in the cluster selected

was visited. Only permanent residents of the communities were interviewed, and those houses used only for vacations, or whose members resided in nearby cities were rejected. Only five fishermen families lived in those clusters selected in this sample and only three were finally used in the study. Twenty-one fishermen were interviewed with a second questionnaire where additional information was sought (See Appendix #3).

At El Combate, a small village, the whole fishermen universe was tried to be interviewed with this first questionnaire. Of a total of 32 fishermen 17 were finally covered. Some of them were not present at the time of the visit; others were not willing to answer. A total of 14 questionnaires were finally selected for this study after rejecting those with dubious information. With the second questionnaire, 26 fishermen were interviewed.

The sampling of Playa Guayanilla followed the same procedure as in La Parguera. By means of the cluster technique of sampling, 13 clusters totaling 117 households interviewed were finally selected which represent 25% of the universe of which 40 house heads were fishermen.

The second questionnaire that was filled gathered information about the fishing occupation, distance of the fishing place from home, time they had been engaged in that occupation, aspirations they have for their children in terms of occupation, opinions about the future of fishing as an occupation, and their plans for the future. It took about one hour to fill in this schedule which made the interview difficult for obtaining reliable data.

Some information about social stratification was obtained by looking at leaders in the community as related to different situations and also by asking them their opinions about the highest and the lowest ranked occupations in the community.

An adaptation of this questionnaire was made to gather information about people engaged in other occupations besides fishing. Due to difficulties on interviewing these people, the unreliability of some of the data collected, and the lack of funds to pursue the study, the information already obtained was discarded.

For each of the fishing villages, the following are the total number of questionnaires used in this study, after removing those with codification difficulties and unreliable information.

In this study, more emphasis was given to Puerto Real which is the most important fishing village in this area, has the greatest number of fishermen and is the village producing the greatest amount of fish in the island.

The data for this study was gathered mostly between January 1967 and December 1968.

TABLE NO. 1

NUMBER OF INTERVIEWS MADE AND QUESTIONNAIRES USED IN EACH OF THE VILLAGES STUDIED

Village	Interviews made with Questionnaire No. 1	Total Number of Questionnaires No. 1 used	Fishermen Questionnaires No. 1 used	Fishermen interviewed with Questionnaire No. 2	Questionnaire No. 2 used	Total population covered in the study
Puerto Real	346	330	49	51	50	1410
La Parguera	59	52	3	21	18	259
Playa Guayanilla	121	117	35	35	31	591
El Combate	17	16	14	26	25	80
	<u>543</u>	<u>515</u>	<u>101</u>	<u>133</u>	<u>124</u>	<u>2340</u>

## PUERTO REAL VILLAGE

Birthplace of Roberto Cofresi, the famous pirate, Puerto Real was known at the beginning of the Spanish regime through the many fiction and true stories about daring adventures in his sailings to and from this secluded and calm bay far from the capital city. Far from police forces, this location was very favorable for smuggling, thus becoming Puerto Real the center of these operations to and from neighboring islands. Dutyless merchandise and censored printed materials were not only introduced through this port, but also sugar, tobacco, rum and many other goods were exported. Even today, it has been claimed by newspaper men and neighbors that corruption and vice including drug commerce is flourishing at an alarming rate.

The history of Puerto Real can be traced back to the foundation of Cabo Rojo in 1771. Many of its early inhabitants came from other countries besides Spain as their last name suggests; namely, of Yugoslav, French and Italian origins. Its name (Royal Port) comes from the permission granted by the King of Spain to use its bay as a main port of entrance to the south-western part of the island.

Puerto Real became a very important port due to its convenient location near San German and Mayaguez, already important cities at that time. For political reasons, the charter granted to use the bay as a port was revoked in 1881 by Governor Mendez Vigo to grant the permission to Mayaguez port, which is still in use, in his effort to help

this city that had suffered a severe fire. Cabo Rojo and Puerto Real were condemned to stagnation as its economic activities started to decline after the port was closed.

The village was also well known in the neighboring area since that time for being an excellent site for fishing and swimming due to the placid waters of its closed bay.

#### Location

This fishing village at the south-western coast of the island lies about 4 kilometers (2.6 miles) west of Cabo Rojo, a city of 30,100 inhabitants. Moreover, it is 10 miles south of Mayaguez, with a population of 92,300.<sup>21</sup> Puerto Real is located within the wet-dry western coastal region of Puerto Rico which has an excellent reputation for the high quality of fish produced. The southwestern region contributed during December 1968 to November 1969, with 864,539 lbs. of fish, or 35.9% of the total catch of the island. Cabo Rojo, comprising Puerto Real, El Combate, Joyuda and Guanajibo caught 704,712 lbs. during this same period.<sup>22</sup>

The village used to have only a main street which runs parallel to the seashore where a very simple trade center is located and most of the fishermen live. In 1940, the Social Program Administration of the State government bought an adjacent farm to settle about 480 families mostly of sugar cane workers. With this new addition named Elizabeth, the size and the village population increased considerably, and so did the opportunities for the people of Puerto Real for receiving new services such as electricity and running water.

### Economic Activities and Occupations

Puerto Real main economic activities used to be centered mainly around the sea and its resources, being fishing the occupation engaged by most of its earlier inhabitants. Today, there are about 73 men whose main occupation, they report, is fishing. Others do it as a part-time job, and many others fish occasionally either for entertainment, or for home consumption. Activities related to the fishing occupation such as the manufacturing and repairing of "nasas" and other fishing equipment boat building and repairing provide employment for a few people.

Puerto Real is the most widely used bay for sailing to Mona Island which is located about 50 miles from shore. Very few skilled fishermen charter their boats to carry people through a very rough and dangerous sea in search of hunting and fishing adventures to this island reputed for its excellent fishing and game spots.

At Puerto Real, 20.2% of the heads of households interviewed were either unemployed or retired. No provisions were made in this study to determine how many of those unemployed were out of work for a short time while they find out another job, and how many were chronic unemployed who did not care to look for a job. Neither account was taken as to know how many of the retired were young veterans who were able to work, how many were really in the older ages, and how many of those that responded "unemployed" were engaged in illegal occupations.



TABLE NO. 2  
OCCUPATION OF THE HEAD OF HOUSEHOLD AT PUERTO REAL

Occupation*	Number	Percent
Farm laborers	76	23.0
Retired	55	16.6
Fishermen	49	14.9
Skilled	46	14.0
Housewives	42	12.8
Unskilled	29	8.8
Semi-skilled	18	5.4
Unemployed	12	3.6
Semi-professional	2	.6
Students	1	.3
	330	100

After discarding the unemployed, the retired, the students and the housewives from the total population in the households about 374, that is,

\*In the classification of unskilled, semi-skilled and skilled workers, consideration was given to the degree of specialization or skill needed either self-learned or by apprenticeship. Were classified as unskilled all the laborers not included in the farm laborer group. The semi-skilled includes plant foremen, apprentices of skilled jobs and small merchants. In the skilled were those that required special ability or training such as: the cabinet makers, tailors, mechanics, shoemakers, barbers, chauffeurs of public cars and buses. In the semi-professional group were included those occupations that required education in schools, but not College degrees such as book-keepers and nurses.

less than one half of the population 18 years old and over were in the active labor force. About 19.5% were in the fishing occupation; 30% were farm laborers; 20% were unskilled; 19.7% were skilled; 6.4% were semi-skilled, and 3.4% were semi-professionals. About 15% of the total population (18 years old and over) were either retired or unemployed.

TABLE NO. 3

OCCUPATION OF THE TOTAL POPULATION 18 YEARS OLD AND OVER  
OF THE HOUSEHOLDS INTERVIEWED AT PUERTO REAL

Occupation	Number	Percent
Unemployed	49	6.1
Retired	69	8.6
Fishermen	73	9.1
Farm laborers	114	14.2
Students	19	2.4
Housewives	293	36.5
Unskilled	76	9.5
Semi-skilled	24	3.0
Skilled	74	9.2
Semi-professionals	<u>13</u>	<u>0.2</u>
	804	98.8

Sponsored by the government industrialization development program, 8 industrial plants established at Cabo Rojo provide new jobs to about 1262 workers, mostly women. Due to the close location of Puerto Real, new opportunities have been opened, mostly to the new generation of villagers with

a high school diploma. Industrial plants located in nearby cities such as Mayaguez, San Germán and Hormigueros are also a source of employment for the people of Puerto Real who due to the short distance from these communities can commute daily to their jobs.

### THE FISHING OCCUPATION AT PUERTO REAL\*

The data gathered show that most fishermen at Puerto Real sail in small boats they own, on the average of 16' to 25' in length propelled by inboard motors and sails. Only nine of the fishermen interviewed owned "yolas" or flat-bottomed small boats moved by oars alone.

The Commonwealth Department of Agriculture Fishing and Wildlife Division established in 1959 a program with the purpose of helping fishermen to raise their living conditions by increasing their incomes. Training was given to fishermen in the different villages around the island, on the use of better fishing techniques and equipment. Furthermore, loans were granted for the buying of motors for their boats. This may account for the great number of motorized boats at Puerto Real and at the other three fishing villages studied. The results have been that greater amount of fish has been caught in this area during the last years as reported by fishermen and recorded by the Department of Agriculture.

The fishing occupation is a lonely activity different in this respect from many other occupations where workers are grouped into gangs or crews. At Puerto Real, about 20% of the fishermen travel alone in their boats; about 50% sail either with a pal, a relative, or a neighbor. The small size of the

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\*The information presented herein was gathered by interviewing 50 men who were considered to be engaged in fishing as their main occupation. (See Appendix No. 1)

boats, the use of motors not requiring additional help for manipulating the sails or oars, and the simple fishing technique of the use of "nasas"\*, may be some of the reasons why the crew is limited to one or two persons in most of the boats.

Fishermen leave home usually from 2:00 to 5:00 in the morning and return mostly from 12:00 o'clock to 2:00 in the afternoon. The fishing spot where they usually go is not very far from the shore. About 20% of the fishermen travel less than 3 miles from the coast; 70% travel less than 15 miles and only 3 of them would venture more than 25 miles into the sea. Only those with bigger boats go even as far as Mona Island, about 50 miles south west of Mayaguez.

Today, with the use of the motorized boats, it is easier for them to go farther than before because they neither depend too much on the wind for their travelling nor get tired with the use of oars. Fishermen claim that they would need bigger boats, sarietier sailing devices, and better fishing tools to go to those places they know farther away where fish, they say, is more abundant.

The best fishing months, to the knowledge of these people, are from July to October when their daily average catch per fisherman is about 100 to 300 lbs.. They reported that close to the Lent period, during the months of February and March, the fish is scanty, being the average catch per fisherman less than 100 lbs.. These months, however, are traditionally of higher fish consumption due to the Catholic religious observance.

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\*\*Nasas\*- fishing traps made out of unpolished wood and chicken wire.

The data compiled by the Department of Agriculture of Puerto Rico reveals that during the year 1969, the highest fish producing months for Cabo Rojo and also for Puerto Rico in general were May and April. The lowest producing months according to this source were June and July. The production for May in the Cabo Rojo area was 73,821 lbs., and in the whole island 256,835. In Cabo Rojo, the production for June was 39,322 lbs. and in Puerto Rico 145,318 lbs.<sup>22</sup>

There were only 4 fishermen who owned a "chinchorro" or net for trapping fish which is well known among the people. It is laid into the water in a semi-circle with the two ends of the rope that hold the net, at the shore. Several fishermen help in the process of pulling the net onto the shore with its catch.

The "atarraya", a fishing cuniform net operated by one man, is the most widely used net among fishermen. Only 15 fishermen at Puerto Real owned at least one.

The fishing technique most widely used in Puerto Real is the use of "nasas" or fish traps made out of chicken wire and wooden frames. A fisherman owns and sets an average of about 20 nasas, although there were six that owned more than 50. He lays them into the sea, in specific spots he knows or he hopes fish may be abundant. As he lacks instruments to guide and orient him about the location of the nasas in the sea, he has to watch for reference points in the land, that will guide him when he returns to check on how the traps are doing. On his next trip he will pick up the fish trapped, and lay the nasas

down again, or may move them to other places where he thinks fish would be abundant.

The fish dealers at Puerto Real buy cash from the fishermen most of their catch, at an average price ranging from 23 to 25 cents per pound. They sell it mostly at the metropolitan cities of Mayaguez and San Juan. Although the prices paid to fishermen are considered to be very low, fishermen here have been unable to join in cooperative endeavors either for supplying themselves with the materials they need in their occupation or for marketing their fish more efficiently. The government has been very willingly to help them in this aspect, but so far, they have not yet responded.

Fishing at Puerto Real is a job in which they are not expected to work every day. When asked the question how often they went out fishing only seven responded they did it every-day; eleven went four times a week, and 30 said they went from 2 to 3 times a week.

As most of the fishing is done by nasas or traps, each two or three days they go and take a look to see how they are doing. Each fisherman has an average of about 20 nasas which they have to repair frequently. They are expected to last from 1 to 1 1/2 year. During bad weather many of them get lost, and therefore, they have to be replaced. When weather conditions had either damaged or drifted the nasas away, the government has been helpful by paying for the lost traps.

When they return home, after the fishing activity is over, most of them spend the rest of the day talking with

the other fishermen about the day's catch, their fishing adventures and problems. About 4% of the fishermen keep busy in the maintenance and repairing of their equipment after they return home; and 10% are occupied in other jobs and hobbies.



## LA PARGUERA

Southwestern Puerto Rico which is the most arid region of the island provides natural favorable conditions for the harbors of Guánica, Boquerón, Guayanilla and La Parguera to be used as fishing ports.

Within the Lajas Valley, and about 6 miles from Lajas (population 3364), and about 24 miles from Mayaguez, is located the fishing village of La Parguera - a tourist attraction mainly for its phosphorescent bay, a phenomenon occurring in very few places in the world.

It is also widely known throughout the island as a sport fishing and boating resort. Its coral reefs and many mangrove islets not only add extraordinary beauty to the nearby waters, but also are responsible for its calm bay. Its beach is not adequate for swimming due to its muddy condition and algae growing at the bottom. There is an islet, "Mata de la Gata" close to La Parguera, which is a great attraction to swimmers because of its shallow, placid and clean waters.

Site of the Marine Biology Department of the Mayaguez Campus of the University of Puerto Rico, the surrounding sea provides an adequate environment due to the great variety of fauna and flora that thrives in the area, an ideal condition for marine research. The Marine Biology Department has been insistently calling the public attention toward the dangers of the heavy contamination of the island sea waters by the discharges

of the industrial plants, especially by those of the petrochemical industrial complex in southern Puerto Rico. Contamination has also been alleged to be caused to a less extent, at La Parquera, by the increasing number of cabins that are built close to the sea without a sewage system disposing the wastes into the sea. Although construction of new cabins at the public lands close to the sea have been forbidden, the elimination of the already existing ones have not yet been possible to enforce.

With the settlement in 1955 of the community established by the Social Programs Administration of the State Department of Agriculture, La Parquera grew in size with 192 parcels. The population now, according to the 1970 Census is 1017.

#### Economic Activities at La Parquera

Being La Parquera one of the most attractive tourist centers of Puerto Rico, especially for those people that enjoy the sea sports, its main economic activities are directed to serve the thousands of visitors that annually go to this spot.

There is a tourist hotel, two guest houses and about 12 restaurants. Several souvenir shops specialize in crafts using sea-fans, shells, corals and many other local materials.

Boat service to the phosphorescent bay during nights when the luminiscence of the bay can be best admired, is provided by two boat lines. Smaller boats can be chartered for sightseeing or fishing, along the many islets close to the bay. A U-drive boat business also provides boat service for these purposes.

Cooperative endeavors have successfully flourished at La Parguera. Concrete houses for 141 families has been made possible through mutual aid program sponsored by the government. The best grocery store in the village, in operation since 1954 is cooperatively owned by 160 villagers. These experiences of working together might be helpful in the solution of some of the fishermen problems related to their occupation and in providing for their urgent community needs.

#### Other Services Provided at the Community:

Besides the trade services mentioned above, limited religions and educational services are also provided at this community.

A Catholic and a Penthecostal chapels offer regular services to the inhabitants.

There is an elementary school teaching up to the sixth grade. High School education is offered in Lajas.

#### The Fishing Occupation:

Information given by fish dealers in the village and by other persons related to this occupation, report that there are about 95 men engaged in fishing as an occupation in this bay and in adjacent neighborhoods. There are six fish dealers who buy most of the catch of these fishermen.

The occupation of all the population 18 years old and over of the households interviewed at La Parguera were as follows:

<u>Occupation</u>	<u>Number</u>	<u>Percent</u>
Unemployed	6	4.8
Retired & Veterans	5	4.0
Fishermen	1	.8
Farm laborers	8	6.4
Students	4	3.2
Housewives	51	41.1
Unskilled jobs	12	9.7
Semi-skilled jobs	8	6.4
Skilled jobs	24	19.4
Semi-professionals	<u>5</u>	<u>4.0</u>
	124	98.8

A higher percentage of the population is occupied in semi-skilled, skilled and semi-professional jobs. There is less unemployment in La Parguera than in any other of the three villages studied. Higher educational attainments by these people, than in the other villagers, may explain this occupational distribution.

### PLAYA GUAYANILLA.

Adjacent to a petrochemical industrial complex in the southwestern coast of Puerto Rico, about one mile from Guayanilla is the most highly polluted fishing bay in the island which is Playa Guayanilla, with a population of 1635. The oceanographers of the Marine Biology Department of the University of Puerto Rico at Mayaguez detected in this bay a sediment of the discharges of these plants which have an average depth of 18 inches in some areas. At the present time, the fishermen of this village have sued the industrial plants that are discharging its wastes at this bay, thus devastating its flora and fauna at an alarming rate.

Among the four villages studied, Playa Guayanilla showed the lowest level of living conditions. The government has not established a Social Program Administration Community as it did in Puerto Real, La Parguera and El Combate. This may be the reason why no concrete houses have been built by the mutual aid of its neighbors as has been done in the other three villages.

#### Services Provided at the Community

There is an elementary school in the community where the students attend up to the fourth grade. Students go to Guayanilla town to continue higher studies.

Although 72.6% of the heads of households claimed to be Catholics there is not a Catholic church. Only a Penthecostal chapel is found in the village. Catholic church attendance must be very low, as people have to travel to town for this purpose.

There were four restaurants specializing in sea food and several small grocery stores at the time of this study. A mobile shop visits this place once a week and carries miscellaneous items for the house such as textiles and kitchen utensils. Most of the fish caught at Playa Guayanilla bay is sold in this village. There are six persons who buy the fish; one of them controls more than 50% of all the catch.

For additional information about the fishing occupation in Playa Guayanilla, please see Appendix No. 1.

With the recently constructed new highway connecting Mayaguez and Ponce, the village, with access to the older road, will become more isolated in the near future.

Distribution of the population 18 years old and over, of the households interviewed at Playa Guayanilla, according to their occupation:

Occupation	Number	Percent
Unemployed	15	5.6
Retired and Veterans	7	2.6
Fishermen	42	15.8
Farm laborers	5	1.9
Students	15	5.7
Housewives	106	40.0
Unskilled	30	11.3
Semi-skilled	5	1.9
Skilled	31	11.6
Semi-professionals	<u>9</u>	<u>3.4</u>
	265	99.8

## EL COMBATE

About 16 miles southwest of Cabo Rojo, leaving kilometer 8 of road #301 and driving about two miles of an unpaved road is located the smallest of the fishing villages studied, El Combate.

According to Carmen Hernández, a retired fisherman who now owns a small bar and poolroom in this place, the first settler of this village was his father, a fisherman who migrated with his family about sixty years ago. The children followed their father's occupation and even today, there are about twelve of the Hernández descendants who earn their living fishing.

During the last years the population of El Combate has been increasing fast due to a Social Program Administration Community established in 1962 with 76 parcelas. About 32 fishermen settled here with their families. Many other people that were occupied in diverse jobs, besides fishing, came also to live here. Several have illegally built resort cabins along the seashore.

Unlike La Parguera, Puerto Real and Playa Guayanilla, the clean beach of El Combate is very appropriate for swimming. On this account, it has gained in nearby communities such a reputation that on week-ends and holidays visitors flock to this village. Although the dressing rooms and the dining facilities for visitors are very rustic, lacking inadequate sanitary services and other basic necessities seem to be sufficient for the demands of these visitors.

Very limited trade services are offered at El Combate. Only three very small grocery-bar stores can provide the essential goods for a very simple dinner.

About three kilometers from the village, at El Corozo neighborhood located on the paved road, a grocery store and a service station also serve the villagers.

The children of El Combate attend up to the sixth grade to an elementary school located in El Corozo. Those pursuing Junior High school attend Boqueron school which is about fourteen kilometers from the village. High School may be attended at Cabo Rojo. The city government pays transportation to those students that commute.

Although about 87% of the head of households interviewed, 93% of their wives and 81% of their parents were Catholic, very few people attend the Chapel at El Corozo where masses are officiated.

Protestant services are offered weekly in one of the houses of the neighborhood. Plans are on the way for the construction of a Protestant Chapel at El Corozo.

#### The Fishing Occupation:

At the time of the study only 55 of the parcelas at El Combate were settled. The following were the occupations engaged by the head of households at that time:

Fishermen .....	32
Unemployed .....	8
Housewives .....	5
Carpenters .....	2



Carpenters Aides .....	2
Merchants .....	1
Store Clerks .....	2
Boat Operators .....	1
Fish Peddlers .....	1
Retered Veterans .....	<u>1</u>
Total .....	55

The occupation of all the population, 18 years old and over, of the households interviewed, in terms of percentage were as follows: fishermen 45%, housewives 42.5%, unemployed 7.5%, unskilled jobs 2.5% and semiprofessional jobs 2.5%.

There were two fish buyers at the villages who bought all the catch at El Combate. One of them owns a fishing boat operating on a share basis with the men who sail on it. This buyer controlled about 75% of the fish caught.

El Combate commercial fishing, as in many of the fishing villages of Puerto Rico, is undergoing modernization of its equipment and its techniques. Great interest among these fishermen to attend short courses in boat building and in the use of improved fishing techniques and equipment, has been reported by the Wildlife and Fishing Division of the Department of Agriculture.

Information regarding the fishing occupation at this village is presented in Appendix No. 1.

### LEVEL OF LIVING

There is no absolute consensus among sociologists as to the meaning of the concept level of living, but it has been generally accepted to encompass consumption patterns, material possessions or living conditions of a given population.

Socioeconomic scales have been devised to rank families in given communities in a quantitative way to make comparisons among communities and to detect changes that may occur in their living conditions over a period of time. One of the most widely known and used scale is Sewell's, which was developed to study Oklahoma farm families in 1940.<sup>19</sup>

The scale was revised ten years later by Belcher and Sharp to adapt it to changes in cultural conditions.<sup>1</sup> By excluding the social participation items they came out with a valid and reliable scale for measuring not socio-economic conditions, but a level of living index for the open country population of Oklahoma. At present, Belcher is working out a scale for measuring the level of living cross culturally, expecting to test out its validity among the United States and some Latin American communities.<sup>2</sup>

Socio-economic and level of living scales have been widely used by the sociologists as objective criteria in determining social rank, and to some extent, the expected peculiar behavior of the different families within a community. Level of living has been found to be correlated with social class because people within a class tend to share similar behavior patterns, possessions, attitudes and

values.

Sociologists have also found that level of living scores are useful indices in the study of occupation, education, adoption of new practices and social participation. Moreover, they are correlated to income, place of residence and fertility.

The level of living measure in this study is expected to bring out quantitative information about the living conditions of fishermen in south-western Puerto Rico. This information will be useful in making comparisons with several other occupational groups, and with other communities in detecting some areas that would need improvement according to the established standards.

Park's classical ecological Chicago studies showed that level of living conditions are similar among people in each of the different areas of the city. People living close together in a given area, tend to live in a similar condition, and people with similar ideal and economic characteristics tend to live in the same areas of the city.<sup>13</sup>

That the sea, as a water occupational resource tends to influence the level of living conditions of the people engaged in fishing as well as it influences other behavioral patterns, is one of our hypotheses in this study.

The level of living scale adapted for this study ordered the families from 15 points, which would be the answers to the most desirable items in all the questions, to rank in the highest status. The answer to the less desirable items in

each of the answers gets the highest points in this level of living scale - the highest the total number of points, the lowest the position attained by any household.

The lowest score among the 4 villages studied was 19 at El Combate; the highest had a value of 64, at Playa Guayanilla. The average score for each of the villages was as follows: Parguera had the best living conditions scores with 34.4 followed by El Combate which had 37.2; Puerto Real 38.6 and the worst scores were found in Playa Guayanilla with an average of 40.8.

TABLE NO. 4

LEVEL OF LIVING SCORES AVERAGES  
ACCORDING TO OCCUPATION AND VILLAGE

Occupation	Playa			
	Puerto Real	La Parguera	Guayanilla	El Combate
Unemployed	42.4	34.0	37.2	---
Retired	39.4	29.6	33.0	---
Fishermen	39.8	----	45.5	38.1
Farm laborers	39.6	33.2	45.7	---
Unskilled workers	38.0	35.7	39.5	19.0
Semi-skilled workers	30.8	28.0	38.8	---
Skilled workers	35.4	34.3	38.9	---
Semi-professionals	25.0	32.5	32.0	.42
<b>Total</b>	<b>38.6</b>	<b>34.4</b>	<b>40.8</b>	<b>37.2</b>

Fishermen at Puerto Real live mostly in an area along the main street running parallel and close to the waterfront. The houses located on public land are close to each other with

narrow passages among them. In many houses, part of it stands on the sea; very convenient for boarding the boat and keeping it safe when not in use.

The size of each lot is not clearly demarcated. In addition, they lack definite fences to distinguish the land ascribed to each house. Most of the houses at the Elizabeth Community, the new addition, have a lot about 1/2 acre in size. Although the land is owned by the government, new legislation provides for selling this land to those that at the present time live on it. About 36 fishermen live in this area in spite of the inconveniences of keeping the boat close to the shore far from the care of its owner.

Fishermen level of living at Puerto Real tended to be similar to those of the farm workers who were the lowest among all the occupational groups. The semi-professionals showed the best living condition (having the lowest score) in Puerto Real and Playa Guayanilla.

At Playa Guayanilla, farm laborers scores showed a very small difference from the fishermen who occupied the lowest position in this scale. Unskilled, semi-skilled and skilled workers had similar scores in this village.

There were no farm laborers at El Combate, and very few semi-skilled and skilled workers, but none were selected in the sample. The very low position obtained by the semi-professional group which was even lower than the fishermen, may

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\* Other unskilled workers included  
 \*\* Semi-skilled workers  
 \*\*\* Semi-professional

be due to the fact that only one person was interviewed.

The total figures for all the villages showed that fishermen had the lowest living condition among all the occupational groups, without taking into consideration the retired which occupy the lowest position at Puerto Real. There are differences between villages as to the ranking of the different occupational groups of semi-skilled, skilled and semi-professional workers in this living conditions scale.

The distribution of the level of living scores shows that about 69% of Puerto Real households are in the 26-45 group; 73% of La Parquera; 72% of Playa Guayanilla; and 62% of El Combate. Thus indicating that most of these people live in fairly good conditions. Among the four villages, Guayanilla had the highest percentage of households classified in the 56-65 group, which denotes poorer living conditions. Furthermore, it had the lowest percentage in the 15-25 group that stands for better conditions.

Two of the basic necessities of modern living: electricity and running water are provided to a very large extent to the houses in all the four villages. It is a government policy to provide these utilities to communities established by the Social Program Administration. In 3 of the fishermen villages studied, government sponsored settlements were established close to the already existing villages and older residents also came to receive these services.

About 95% of the households interviewed at Puerto Real, 92% at La Parquera, 83% at Guayanilla and 100% at El Combate\* had electricity.

\* El Combate sample was only 16.

DISTRIBUTION OF LEVEL OF LIVING SCORES AT PUERTO  
REAL, LA PARGUERA, PLAYA GUAYANILLA AND EL COMBATE

Scores	Puerto Real		La Parguera		Playa Guayanilla		El Combate		Total
	Num.	%	Num.	%	Num.	%	Num.	%	
15-25	26	7.9	7	13.5	1	0.8	1	6.2	35
26-35	89	27.1	26	50.0	37	31.6	7	43.7	159
36-45	137	41.8	12	23.1	47	40.2	3	18.7	199
46-55	71	21.6	6	11.5	25	21.4	5	31.2	107
56-65	55	1.5	1	1.9	7	6.0	0	----	13
Total	328	99.9	52	100	117	100	16	99.8	513

No records were obtained as to radio and T.V. sets in each house, but it may be implied by these figures and by the data on the Census about radio sets, that information diffused through radio could reach a very high percentage of the population.

Although running water is provided in about 86% of the houses at Puerto Real, 88% at La Parguera, 56% at El Combate and 68% at Playa Guayanilla, only a very small percentage of the houses in these villages has flush toilet facilities: 18.9%, 30.7%, 19.6% and 6.2% respectively. Latrines are used in most of the houses.

Very few houses have a bathtub, but shower facilities are found in about 64.3% of the houses at Puerto Real, 80% at La Parguera, 61.5% at Playa Guayanilla and 43.7% at El Combate.

An index of level of living is the number of persons in a house per bedroom. People living in the poorest conditions have the largest number of persons sleeping in the same room

and use other rooms in the house for this purpose. The average number of rooms, the average number of bedrooms and the average size of the family living in the same house for each of the villages is found in the following table.

TABLE NO. 6

AVERAGE NUMBER OF ROOMS, AVERAGE NUMBER OF BEDROOMS AND AVERAGE SIZE OF THE FAMILY IN PUERTO REAL, LA PARGUERA, EL COMBATE AND PLAYA GUAYANILLA

Village	Average number of rooms	Average number of bedrooms	Average size of the household
Puerto Real	4.4	2.3	4.3
La Parguera	4.9	2.4	5.1
Playa Guayanilla	4.2	2.5	5.1
El Combate	4.3	2.6	5.0

The possession or not of an automobile is today a new reliable item for the level of living scales in Puerto Rico. It is not only a highly well recognized status symbol, but also a useful tool for the people of these villages to commute to their jobs at the industrial centers, to shop for variety and quality at commercial centers in nearby cities. Furthermore, they use it for recreational purposes.

Sponsored by the mutual aid program of the Social Program Administration, 101 concrete houses have been built at the Elizabeth Community.

Concrete construction of walls, floors and roof receive the highest points in the construction material of the house items of the level of living scale used in this study.



TABLE NO. 7

TRANSPORTATION METHODS USED BY VILLAGERS OF PUERTO REAL,  
LA PARGUERA, PLAYA GUAYANILLA AND EL COMBATE

Village	Own Automobile Num.	%	Public			Total
			Num.	Transportation %	Other Methods Num.	
Puerto Real	66	20.0	262	79.4	-----	328
La Parguera	28	53.8	24	46.1	-----	52
Playa Guayanilla	24	20.5	91	77.8	2	117
El Combate	10	62.50	6	37.5	-----	16

## FERTILITY

The alarming increase in the world's population during the last years has brought about a revival in the study of population fertility. There is an increasing interest in discovering the causes and conditions that may be related to it, which could give insights for detecting possibilities for its control.

Demographic studies have consistently found out a correlation between the fertility of a given population and the ranking of occupational groups such as professionals, skilled, semi-skilled and unskilled workers. The higher the rank granted to the occupational group, the lowest the fertility of its component. However, no record of fertility studies among fishermen communities have been found in the literature reviewed.

Research has shown that years of school attendance and income, although closely associated with occupation, by themselves, are associated with fertility. The higher the school attendance, and the higher the income, the lower the fertility of the population tends to be.

Low fertility has also been found to be a function of industrialization. The extent to which the labor force is employed in industrialized jobs rather than in agricultural occupations determine to a large extent the degree of fertility.

Urbanism is another factor related to fertility. The greater the degree of urbanisms, as measured by the size of

the community, the lower the fertility. Otherwise, the farther away from the urban centers, and the smaller the community, the higher the fertility of its population.

Population fertility has been measured by sociologists using an index or fertility ratio which has been found to be the most accurate and practical method for most of the population studies. Fertility ratio takes into consideration only the women of a given population which are in the reproductive age, which has been accepted to be from 15 to 49 years, and the number of children less than 5 years old in that population.

In this study, fertility ratio was determined following the U.S. census method: children less than 5 years old per women aged 15 to 49 years.

Other measures of fertility that have been used is the completed family size which is determined by the number of children who have been born to women over 45 years old—the age at which women, on the average, finish their reproductive functions.<sup>15</sup>

In this study this measure was also taken into consideration in order to establish relationships with the fertility ratio. No comparable figures of completed family size are available for other communities in Puerto Rico that could be associated with those obtained in this study.

Fertility ratio of the total population in Puerto Rico according to 1960 census is 664. It varies from 481, the lowest found out in Fajardo, a city at the eastern coast, to

the highest (1014), at Orocovis, a small town at the central mountainous tobacco region. These two towns show the characteristics of urbanity and industrialization in one, and rurality and agricultural employment in the other, which have been determined to be associated with fertility.

Cabo Rojo city with a fertility ratio of 501, occupied in the 1960 census the fourth position among all the communities of Puerto Rico, ranking from the lowest fertility ratio to the highest. In this western area, and close to Cabo Rojo, are located also the communities of Hormigueros, San Germán, Guanica, Lajas, and Rincón which are among the ten communities having the lowest fertility ratio in Puerto Rico. These communities, however, do not show the same ranking in those characteristics associated with low fertility such as degree of urbanism or population size, industrialization and school attendance.

Among the fishing villages studied, El Combate, which is located the farthest from any urban center, manifested the highest fertility ratio of 923. It is worth pointing out that the population represented in the sample consisted only of fishermen and skilled workers. Puerto Real with 593 and La Parguera with 571 followed, and Guayanilla with 550 had the lowest fertility. La Parguera is farther away from an urban center than is Puerto Real. A higher percentage of its labor force is engaged in skilled, semi-skilled and semi-professional jobs than any other of the villages.

Among the occupational groups of Puerto Real, the farm laborer was the most fertile with 695.6 and the less fertile

was the semi-skilled laborers with 611. The second highest fertility group was the fishermen with 627.9. Semi-professionals ranked third with 625.0 and the unskilled workers were fourth with 621.6. The fertility ratio tended to follow different patterns of relationships regarding to occupation in each of the villages studied.

TABLE NO. 8

FERTILITY RATIO OF PUERTO REAL, LA PARGUERA, PLAYA GUAYANILLA AND EL COMBATE FISHING VILLAGES ACCORDING TO THE OCCUPATION OF THE HEAD OF HOUSEHOLD.

Occupation	Puerto Real	La Parguera	Playa Guayanilla	El Combate
farm laborers	695.6	222.2	1333.3	----
unskilled workers	621.6	714.3	666.6	----
fishermen	627.9	-----	512.8	916.6
semi-skilled laborers	611.0	250	125.0	----
skilled laborers	-----	-----	600	1,000
semi-professionals	625	888.8	612.9	----

#### Fertility and Education:

Although population studies have showed a positive correlative between school years completed and fertility, no relationships were found in any of the villages studied.

#### Fertility and Living Conditions:

The better the living conditions or the level of living of a given population the lower its fertility ratio. This assertion was found to be consistent in Puerto Real. Not all the level or living score groups in each of the other villages studied responded the same way, but a general trend in this direction may be observed.

When the average level of living scores of each village was taken into consideration, no relationship was found with the fertility ratio of its population-the village showing the best average level of living score did not show the lowest fertility ratio. In fact, Playa Guayanilla, which had the lowest living

conditions, had the lowest fertility ratio.

TABLE NO. 9

FERTILITY RATIO OF PUERTO REAL, LA PARGUERA, PLAYA GUAYANILLA AND EL COMBATE FISHING VILLAGES ACCORDING TO SCHOOL YEARS COMPLETED BY THE HEAD OF HOUSEHOLD.

School years Completed	Playa			
	Puerto Real	La Parquera	Guayanilla	El Combate
less than 1 year	314.3	1,600.0	615.4	1000.
1 - 3 years	794.9	352.9	615.4	1000.
4 - 6	494.9	705.9	463.4	1200.
7 - 9	868.4	000.0	347.8	----
10 - 12	481.4	277.7	761.9	1000.
College or more	125.0	2,500.0	800.0	1000.

TABLE NO. 10

FERTILITY RATIO OF PUERTO REAL, LA PARGUERA, PLAYA GUAYANILLA AND EL COMBATE FISHING VILLAGES ACCORDING TO THE LEVEL OF LIVING SCORES OF THE POPULATION.

Level of Living Score	Fertility Ratio			
	Puerto Real	La Parquera	Playa Guayanilla	El Combate
15 - 25	241.4	300.0	----	----
26 - 35	363.6	529.4	380.9	666.6
36 - 45	635.6	357.1	491.2	1000.0
46 - 55	1000.0	1750.0	920.0	1000.0
56 - 65	1666.6	3000.0	800.0	----
Total	592.9	571.4	550.3	923.1

TABLE NO. 11

FERTILITY RATIO AND AVERAGE LEVEL OF LIVING SCORES OF PUERTO REAL, LA PARGUERA, PLAYA GUAYANILLA AND EL COMBATE VILLAGES

Village	Fertility Ratio	Average Level of Living Scores
Puerto Real	592	38.6
La Parguera	571	34.4
Playa Guayanilla	550	40.8
El Combate	923	37.1

The level of living of the family may depend on its size mainly when its sustenance is by only one breadwinner.

The average family size in Puerto Rico, according to U.S. Census for 1960 was 4.79. However, Hatt's study among Puerto Rican workers disclosed that three fourths of the adults interviewed expressed preferences for less than four children and one half of those interviewed preferred two.<sup>7</sup> In these fishing villages, the median number of children was similar to the ideal number expressed in Hatt's study. At Puerto Real, the median number of children they ever had, not including stillbirths, was four. About 43% of the families had three children or less, and 54% four or less. The median number of children they had at the present time was three. About 54.6% of the families have 3 children or less alive; 65% four or less; and 12% had no children at all. The parents' age was not taken into consideration in this data.

El Combate shows that the women had fewer children here than in any other village. As a matter of fact, fewer children



are still living. About 69% of the families had three children or less; 75% had four or less. The median number of living children is three. At present, about 75% of the families have four or less children.

La Parguera figures (as to the number of families that had three children or less) are similar to Puerto Real, (see Table #12). About 63.4% of the families have now 4 or less children in La Parguera, and 64.9% in Puerto Real.

Playa Guayanilla shows more children per household than any of the other three villages. About 35.9% of the families had three or less children and about 44% had less than four. Now about 61.5% of the families have four or less children.

The completed family size is another measure of detecting the fertility of a given population--the number of children given birth by women who have passed their childbearing age. In this study, 45 years was taken as this age. No congruency was found between completed family size and fertility ratio in any of the villages and occupational groups studied.

Puerto Real and Guayanilla showed 7, as the total number of children women in this age ever had. La Parguera figures shows 5 and El Combate, 4.

TABLE NO. 12

NUMBER OF CHILDREN THAT WERE BORN AND NUMBER OF LIVING CHILDREN IN EACH HOUSEHOLD AT PUERTO REAL, LA PAR-  
GUERA, PLAYA GUAYANILLA AND EL COMBATE FISHING VILLAGES.

Number	Number of Children born						Number of Children living at Present									
	Puerto Real		Playa Guayanilla		El Combate		Puerto Real		La Parguera		Playa Guayanilla		El Combate			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
0	32	9.7	3	5.8	7	6.0	2	12.5	41	12.5	4	7.7	10	8.4	2	12.5
1-2	65	19.7	14	26.9	25	21.3	5	31.2	80	24.4	15	28.8	30	25.6	5	31.2
3-4	81	24.5	14	26.9	20	17.1	5	31.2	92	28.1	14	27.0	32	27.1	5	31.2
5-6	39	11.8	6	11.5	22	18.8	2	12.5	50	15.2	7	13.4	23	19.4	3	18.7
7-8	45	13.6	8	15.4	14	12.0	2	12.5	36	11.0	8	15.4	12	10.2	2	12.5
9-10	28	8.5	4	7.7	8	6.8	1	6.2	19	5.8	3	5.8	6	5.1	0	0
11-12	21	6.4	2	3.8	10	8.5	0	0	5	1.5	1	1.9	5	4.3	0	0
13 and more	19	5.5	1	1.9	11	9.4	0	0	4	1.2	0	0	0	0	0	0

No allowance is made as to age, and no consideration is given as to whether the children who are still alive are living in the same home.

TABLE NO. 13

THE COMPLETED FAMILY SIZE BY OCCUPATION IN EACH OF THE FISHING VILLAGES OF PUERTO REAL, LA PARGUERA, PLAYA GUAYANILLA AND EL COMBATE.

Occupation	Playa			
	Puerto Real	La Parguera	Guayanilla	El Combate
Unemployed	8	----	7	6
Retired	7	5	6	----
Fishermen	9	----	9	4
Farm Laborers	7	6	6	----
Unskilled	3	4	4	7
Semi-skilled	5	6	7	----
Skilled	7	5	8	----
Semi-Professionals	----	----	----	----
Total	7	5	7	4

#### Size of Household:

Other members of the family besides the children and parents come to live in the same home constituting in most of the cases an economic burden to the head of the household who is rearing his children.

Puerto Real has the less number of people living in the same house, 4.3; Guayanilla and La Parguera had the greatest with 5.1. Among the occupational groups, the fishermen had more number of people in each household in Puerto Real and El Combate. The unskilled workers had more at La Parguera, and the semi-professionals at Playa Guayanilla.

TABLE NO. 14

AVERAGE SIZE OF HOUSEHOLD BY OCCUPATION OF HEAD OF HOUSEHOLD  
AND VILLAGE

Occupation	Playa			
	Puerto Real	La Parguera	Guayanilla	El Combate
Unemployed	4.7	11.0	4.2	0.0
Retired	3.1	4.8	3.0	0.0
Fishermen	4.9	0.0	6.0	5.3
Farm Laborers	4.7	5.5	3.5	0.0
Housewives	3.3	5.3	3.8	0.0
Unskilled	4.8	6.4	5.0	3.0
Semi-skilled	4.4	4.0	4.2	0.0
Skilled	4.7	4.2	5.0	3.0
Semi-professionals	4.5	5.5	7.0	0.0
Total	4.3	5.1	5.1	5.0

## RELIGION

It seems that the villagers do not take religion too seriously or else, they have peculiar ways of complying with the church dogmas. A local Catholic priest of Cabo Rojo reports that although about 70% of the children of Puerto Real are baptized at the Catholic church, only about 40 members attend mass every Sunday at the village chapel, and only 15 women belong to the "Hijas de Maria" association. The Catholic chapel is named honoring the "Virgen del Carmen", the patron saint of fishermen. It is a tradition at Puerto Real and other communities that lie by the seashore to celebrate a procession on the Saint's Day and take the Virgin in a boat ride around the bay. At Puerto Real, this procession is celebrated every year with great enthusiasm by all the villagers.

However, of the 330 households interviewed, 47.9% of the wives and 54.5% of the husbands claimed to be Catholics and 62% of the household head parents also belong or used to belong to this church. It may be interpreted that baptizing their children in the Catholic church is more a tradition, rather than their duty or obligation to comply with their church precepts. In fact, about 13% of both the husbands and the women that responded that they were Catholic, also practiced or attended spiritualistic rites, an act that is strictly forbidden by the Catholic church and heavily punished with excommunication.

About 15% of all the fishermen, (about one in every four-23% of the fishermen marriages) live concensually or not

legally married. The figures for the whole population of Puerto Real is 13% (75 out of 559 married persons).

Among the farm workers, the degree of concensually is less than is the fishermen. Only about 11% of those married were concensually and 7.9% of all the farm workers.

About 9% of the household heads and 12% of the wives consider the spiritism as religion. Taking together those who besides practicing the spiritialistic rites also belong, to the catholic church, and the very few who are also protes-  
tants and spiritists it was found that close to one fourth (24.6%) of the head of households and their wives believe in spiritism. In all the other three fishing villages only one head of household and one wife said to be spiritist besides being catholic and none claimed to belong or to believe in spiritism as their only religion.

A Penthecostal church which was established about 16 years ago, and holds services three times a week in the local chapel, reported a membership of only 16 persons. About 23 heads of households (7%) and 18 wives (5%) claimed to belong to a Protestant and Spiritist religion at the same time. No information was obtained as to what denomination they belonged to, nor the religious affiliation of the other members of the family nor the location of the church where they usually go.

Men at Puerto Real were less religious concerned than women, not only in observing the religious precepts, such as church attendance, but also, the men in greater number than women were not affiliated to a church. About 9.6% of the men

and 3.6% of the women responded they had no religious affiliation at all. The number may be higher for the men, as some women interviewed responded that they did not know the religious interests of their husbands. It can be interpreted that those men really were not belonging to any specific church.

TABLE NO. 15

RELIGIOUS AFFILIATION OF THE MALES, HEADS OF HOUSEHOLDS  
AT PUERTO REAL, PLAYA GUAYANILLA AND EL COMBATE VILLAGES

	Puerto Real		La Parquera		Playa Guayanilla		El Combate	
	No.	%	No.	%	No.	%	No.	%
Catholics	179	54.6	41	78.8	85	72.6	14	87.5
Protestants	22	6.7	4	7.7	15	12.8	1	6.2
Spiritists	30	9.1	-	-	-	-	-	-
Catholic and Spiritists	44	13.4	-	-	1	.9	-	-
Protestants and Spiritists	1	.3	-	-	-	-	-	-
No Religion	32	9.8	-	-	3	2.6	1	6.2
No Males Head	14	4.3	-	-	11	9.4	-	-
No Information	6	1.8	7	13.5	2	1.7	-	-
TOTAL	328	100.	52	100.	117	100.	16	99.9

## EDUCATION

Formal school attendance has been found by sociologists to have predictive values in studying the group behavior. It has been correlated to occupational opportunities, income, level of living, social participation, fertility, and so forth. Research among farmers reveal that the higher the school attendance, the higher the degree of adoption of new agricultural technology.<sup>18</sup> It can be predicted that similar studies with fishermen may yield similar results.

The new government educational programs for helping fishermen obtain better levels of living through the use of modern technology must take into consideration the schooling of these people in order to motivate them properly for adopting the new fishing practices.

Formal education facilities at Puerto Real consists of one elementary and junior high school with an enrollment of 245 students. Due to the short distance from Cabo Rojo, the students may pursue their high school studies at that city. The Government provides free transportation to those students that study at the Mayaguez Vocational High School in Mayaguez, where they can be specialized in such fields as mechanics, electricity, and plumbing, etc.

College education at southwestern Puerto Rico is offered at Mayaguez by the State University of Puerto Rico and by an Extension division of the Catholic University of



Puerto Rico, and at San Germán, by The Interamerican University. All of them are located about half an hour from Puerto Real.

In spite of all these opportunities, and the vast scholarship program sponsored by the government, the education of Puerto Real villagers is quite low. Only about 2.1% of the households in this village have more than high school education and about 20% less than 1 year of schooling. The population of Puerto Real shows the lowest school attendance among the four villages with about 45% of the head of households having three years or less of schooling followed by Playa Guayanilla with about 36%, La Parquera with 34.6%, and El Combate with 31.2%. (see Table #16)

Among all the villages, La Parquera has the greatest percentage of head of households with ten years or more of schooling. El Combate had the highest percentage in the College group.

The 1960 Census reports 4.6 as the average schooling for the total population of Puerto Rico, 6.5 years for the urban sector and 3.6 for the rural. The Economic Report to the Governor, issued in 1967 by the Planning Board of Puerto Rico points out that the median average years school completed by persons 25 years old or more in Puerto Rico, increased to 6.1 in 1966.<sup>5/</sup>

Among the occupational groups of the heads of household in the four villages, the retired had the highest percentage (29.77%) in the less than 1 year schooling

The median years of school attained by all the persons over 25 years old is as follows:

	Puerto Real	La Parguera	Playa Guayanilla	El Combate
Men	4.0	5.5	5.0	5.0
Women	3.0	4.0	4.0	4.5
Total	4.0	4.0	4.0	5.0

category, followed by the unemployed with 27.7%. The farm laborers and the fishermen were next with 22% and 19% respectively. The difference between the fishermen and the farm laborers is greater in the category of 3 years or less of schooling where 48% of the fishermen and 59% of the farm laborers were in this group. The median number of school years completed by the fishermen in all the villages was 3.0.

The semi-skilled group showed a higher percentage of those with less than 3 years of schooling 33% as compared with the unskilled group which had 25%.

There is a greater concern among the younger generation for school attendance, and among the older generation, there is an increased interest that their children study. Education is not only of great interest for the younger generation, but also it is of great interest for the old generation that their children study.

The semi-professional group, those that required greater formal school preparation, were the youngest in all the four

villages. Among the occupational groups the average number of years being 33.8 for Puerto Real, 29.6 for La Parguera, 34.3 for Playa Guayanilla and 27.0 for El Combate. (See Table 19 on Page 70).

EDUCATION ATTAINED BY THE HEAD OF HOUSEHOLD OF PUERTO REAL, LA PARGUERA,  
PLAYA GUAYANILLA AND EL COMBATE VILLAGES

Village	Less than 1 year		1-3 years		4-6 yrs.		7-9 yrs.		10-12 yrs.		College		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Puerto Real	65	19.8	84	25.6	108	32.9	39	11.8	25	7.6	7	2.1	328
La Parguera	4	7.7	14	26.9	16	30.7	3	5.8	13	25.0	2	3.8	52
Playa Guayanilla	14	12.0	28	24.0	32	27.3	22	19.0	17	14.5	4	3.4	117
El Combate	3	18.7	2	12.5	5	31.2	3	18.7	2	12.5	1	6.2	16
Total	86	16.7	128	25.0	161	31.4	67	13.1	57	11.1	14	2.7	513

TABLE #17

SCHOOL YEARS ATTENDED BY THE HEAD OF HOUSEHOLD IN ALL THE FISHING  
VILLAGES STUDIED ACCORDING TO THEIR OCCUPATION

Occupation	less than 1 yr.		1-3 yrs.		4-6 yrs.		7-9 yrs.		10-12 years		College or more	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Unemployed	5	27.7	2	11.1	4	22.2	4	22.2	3	16.7		
Retired and Veterans	19	29.7	15	23.4	15	23.4	5	7.8	7	10.9	3	4.7
Fishermen	19	19.0	29	29.0	35	35.0	12	12.0	5	5.0	0	0
Farm Laborers	19	22.1	32	37.2	24	27.9	7	8.1	4	4.6	0	0
Housewives	15	26.3	13	22.8	22	38.6	7	12.3	0	0	0	0
Students	0	0	0	0	1	100.0	0	0	0	0	0	0
Unskilled	5	7.9	10	17.5	24	38.1	9	14.3	12	19.0	2	3.2
Semi-skilled	2	7.4	7	26.0	8	29.6	2	7.4	7	25.9	1	3.7
Skilled	2	2.2	20	22.0	27	29.7	20	22.0	18	19.8	4	4.4
Professionals	0	0	0	0	1	14.3	1	14.3	1	14.3	4	57.1
Total	86	16.7	128	25.0	161	31.4	67	13.1	57	11.1	14	2.7

## AGE DISTRIBUTION AND MIGRATION

Communities with rural, traditional characteristics show a higher percent of its population in the younger and in the older ages than those with urban, and a lower percentage of that population in the more productive years (15 to 64 years) as the younger population migrates from the rural sector to the urban in search of better employment. A dependency ratio would show the percentage of the population in the younger and in the older years, who economically depend from those who are productive or potential for the labor force. In this study, for the unproductive years, it was considered the population that was less than 15 years old and those that were more than 65. Those who were from 15-64 were considered to be the productive or the active population.

Puerto Real total age distribution showed less rurality in this dependency ratio than Playa Guayanilla which showed the higher ratio among the villages. (see Table No. 18) La Parguera, although farther away from an urban center than Playa Guayanilla, showed more urban characteristics in this respect. Puerto Real had the less percentage of its population as dependent children, that is, less than 15 years old than any of the other three villages, but it had the highest percentage of people in the older ages-65 years old and more which denotes a higher aging index for its population.

Some signs of migration among the people aged 15-44 might be detected in the Playa Guayanilla age distribution, who probably have migrated from the village to a greatest extent than in the other three villages, in search of better employment opportunities. Although a petrochemical industrial complex is located only about 1 1/2 miles from the village, it has been claimed that only high school graduates qualify for employment in these industries. Therefore, very few of the older population qualify for employment in these plants. There are fewer chances for the fishermen in these villages because their educational level is very low-50% have less than three years of schooling, and only 2.6% have 10-12 years.

People tend to migrate to the States when there are few opportunities in their community to earn a living. In 31% of the houses interviewed in Puerto Real, some members of the family who used to live in the same house were living in the mainland. In 14% of the houses, there were some that used to work in the States for a short time returning home afterwards.

In Playa Guayanilla, the degree of migration to the States is not as high as in Puerto Real. About 16% of the households had someone in the family who had migrated the mainland. Moreover, 7.7% had worked there for a short period of time. No data of migration within the island was obtained, but age distribution figures show that among the three fishing villages, Playa Guayanilla got the

greatest loss of population from the 15 to the 44 years old bracket. These young people may not have the schooling preparation required by the industrial petrochemical complex close to the village. For this reason, they are forced to leave the community.

At La Parguera, only 15% of the households had somebody who had migrated and were at present living at the United States. Only in 2% some had worked in the mainland, but were at home now.

Communities with a high percentage of its population in the younger and in the older, dependent years have more difficulties in providing the essential necessities to its inhabitants as fewer people in their productive years have to give economic support and provide services to all the unproductive population.

Among all the occupational groups and without taking into consideration the retired and veteran group, the fishermen were the oldest group at Puerto Real, with 45.5 years average age, very close to the farm labor. At Guayanilla, fishermen were 52 years average age. They were not only the oldest occupational group in the village, but also the oldest among the fishermen groups in the other three villages. The figures for La Parguera which show fishermen with the lowest average age, among the labor force is not a reliable data due to the small size of the sample.

Studies among farm families of the Mayaguez western agricultural region of Puerto Rico pointed out that farmers median age was 52 $\frac{17}{2}$ . The median age for the housewives in



TABLE NO. 18

AGE DISTRIBUTION OF THE POPULATION OF PUERTO REAL, LA PARGUERA, PLAYA  
GUAYANILLA, AND EL COMBATE INTERMS OF PERCENTAGE

Age	Puerto Real %	La Parguera %	Playa Guayanilla %	El Combate %	Puerto Rico* %
0-4	12.0	13.7	12.3	15.0	14.1
5-14	24.5	27.7	32.5	27.5	25.6
15-44	40.7	39.2	35.1	35.0	41.3
45-64	15.2	15.2	16.9	22.5	13.4
65 and over	7.6	4.2	3.2	0.0	5.6
Total	100.	100.	100.	100.	100.

\*Estimated population in P.R., 1967. P.R. Department of Health, Annual Report on Vital Statistics of P.R., 1967.

TABLE NO. 19

AVERAGE AGE OF THE POPULATION OF PUERTO REAL, LA PARGUERA, PLAYA  
GUAYANILLA AND EL COMBATE VILLAGES ACCORDING TO THEIR OCCUPATION

Occupation	Puerto Real	La Parguera	Playa Guayanilla	El Combate
Retired	65.9	62.6	71.7	--
Fishermen	45.5	29.0	52.0	43.6
Farm Workers	44.5	49.3	42.0	--
Unskilled workers	38.4	41.8	35.5	45
Semi-skilled workers	41.2	40.0	51.4	--
Skilled workers	38.7	35.9	44.5	--
Semi professionals	33.8	29.6	34.3	27
Housewives	43.8	41.8	41.8	38.4
Unemployed	55.5	62.0	49.8	43.3

this region was found to be 47.8, that is, farmers in these fishing villages were younger than those of the western region, but their wives were older than those in these villages.

Research done in the United States and in Puerto Rico on adoption of new farm practices, conclude that those persons in the older ages tend to be more conservative and adopt new practices at a slower rate than the younger people.<sup>18</sup>

Although no studies of adoption of new technology has been carried out among fishermen, it may be inferred from these studies, that people in the same age group may behave in similar ways as previous studies in the adoption process have disclosed. As fishermen are younger, on the average at Puerto Real and El Combate, a faster response to the adoption of new technology in these villages may be expected than in Guayanilla.

#### JOB SATISFACTIONS, ASPIRATIONS AND OCCUPATIONAL MOBILITY

How well satisfied a person feels about his job determines to a great extent his occupational mobility. Job satisfaction is measured not only in terms of the monetary income the individual may receive for the services he performs, but also in terms of spiritual and psychological benefits he gets from his occupation. To the extent that his occupation is able to satisfy his most meaningful urges or needs is the degree of satisfaction a person enjoys in

his job. Porter claimed that in order to attain job satisfaction, the individual must satisfy his needs for security, opportunity, affection, autonomy and self enhancement.<sup>14</sup>

Job satisfaction is related to the expectations and aspirations the individual may have. Persons with a low level of aspirations tend to be satisfied with his job more than those with a high level.

In this study, job satisfaction was detected by asking the following questions: Has there been any moment in your life as fisherman when you have considered to quit your occupation? How do you see the future of the fishing as an occupation for your family? Would you like your children to be engaged in fishing as an occupation?

Aspirations or mental plans or goals a person may have set for his family, or for himself, and which he most of the time expect to achieve in the course of his life time, are to a great extent based upon his previous experiences or from those of others and upon how he perceives and interprets the present situation.

The aspirations of an individual is his main motivation in many cases for occupational mobility, especially when his job is unable to provide him enough resources, or interferes in any way in the process of achieving his desired goals.

What the fisherman desires for his children is determined in this study by knowing his feelings about the occupation he would like for them. A list of occupations

ranking from unskilled to professional jobs was presented and the fishermen were asked to select those which they would like their children to be engaged in the future. It may also disclose his feelings about his occupation in relation to other jobs, and what decision the fisherman would make if the fishing conditions continue to get worst.

The fishing occupation as it is practiced today in Puerto Rico with very simple equipment and small boats, do not provide enough income for the family, as the industrial and other unskilled jobs do. Very few occupational alternatives are open for the fishermen with higher level of aspirations because they have a low educational background that disqualifies them for the better-paid jobs.

When asked what they would do to earn a living in the event that the fishing situation gets worse for them, about 16 or 32% replied that they would turn for a skilled job such as: mechanic, carpenter, chauffeur and electrician. No information was obtained to ascertain their knowledge and skill in these jobs they would like to have. About 20% answered they would turn to industrial and agricultural unskilled jobs and the rest answered ambiguously such as "anything", etc. This may denote that they have no specific plans for the future if the situation worsens.

Fishermen were satisfied with their jobs although they did not receive high incomes from them. Their

satisfaction is not only in terms of the pleasure they enjoy while at the sea, but also the freedom they have while working by themselves without having a boss. They sail whenever they want, and return home when they feel to do so.

At Puerto Real, the village among those studied which is located the farther distance from the polluted discharges of the oil refinery and chemical plants, 85% of the fishermen feel that the future looked uncertain to them, and that the fishing was declining. Only about one half of them, however, have considered to quit this occupation at certain times of their lives. Only 3 out of 49 fishermen, or 6% think fishing has a bright future.

The fishermen of today, although they know the situation is getting worse every time, are not making immediate plans either for moving out of their jobs or for improving their fishing by means of better techniques.

When asked what he would do if the situation got worse, 26 or about 50% would still stay in the village and continue fishing even under this hypothetical poor fishing conditions. About one half of the fishermen look at the future in an optimistic way, but not all of them would stay at the village and continue fishing.

At Playa Guayanilla, the highest polluted bay of all the fishing villages studied, 27 out of 32 or 87% of the fishermen felt that the future of the fishing occupation was uncertain. Moreover, only about one half

of them have given consideration to quit the job. The main reason they gave for not having considered to change their occupation was that they not only made their living out of fishing, but also that they liked it. About 40% would stay and continue fishing if the fishing conditions got worse.

It is very interesting to note this response, even knowing that not only it is a hypothetical question what has been asked, but a real situation. Every day with the heavy pollution, it is getting worse in their bay. In spite of this, they do not have any aspirations to plan something for the future. The answers are similar to those of Puerto Real, where the fishing conditions were very different.

There are more fishermen now at Puerto Real than in the last five years, answered about thirty fishermen. In about 27 or 55% of the fishermen interviewed, their fathers had been also engaged in fishing and in 15 or 30% used to be in agriculture. Confirming the answers about how they saw the future of this occupation, when asked what kind of occupation they would like their children to have, only two persons would like their children to be engaged in fishing and 15 or 30% of those interviewed would like them to be professionals (lawyers, doctors, teachers) and an equal number would like them to be skilled workers. About 20% of the fishermen had

one or two children (male) that were already planning to become fishermen.

We can expect occupational mobility to higher positions among the younger generations to whom greater educational and job opportunities are opened. These opportunities were not possible for their parents. Fishermen have higher aspirations for their children. They would like them to have better-paid jobs than their own.

At Playa Guayanilla, 50% of those interviewed thought there are less fishermen today than there were several years ago. At this village, almost all the fishermen, 29 out of 32, their fathers had also been engaged in fishing as an occupation. About one half of the fishermen had children that were fishermen or were planning to become. Only in 5 cases, none of their children were planning to follow their fathers' occupation. More fishermen in Guayanilla (10) than in Puerto Real (2) would like their children to be fishermen. About 14 would like them to be in professional jobs and 6 in skilled jobs.

Fishermen know that there are distant spots where fishing is more abundant. They also know that in order to fish in these places it is required that they sail in better, and bigger boats with more powerful engines. Besides, they know that they have to use more efficient techniques. (See Appendix No. 1). However, they are not trying, at the present time, to look for these solutions for their decreasing fishing productivity.



Cooperative endeavors in other fishing villages of Puerto Rico, using bigger boats to fish in distant places, have failed. Future studies for discovering different angles of the problem may yield the answers to many of the questions.

## CONCLUSIONS

The purpose of this study was to gain some knowledge about selected social aspects in four fishing villages in southwestern Puerto Rico: Puerto Real, La Parguera, El Combate and Playa Guayanilla. It is expected that these findings may serve as a basis for future research aimed at detecting changes over a period of time as a result of the impact of the increasing population, urbanization and industrialization in these villages.

One of the main objectives of the study was to uncover differences in the level of living, fertility, education and age among fishermen and those engaged in other occupations in the four villages. Moreover, differences were also sought in their religious affiliation, migration, and attitudes toward their occupation and aspirations. In addition to this, information about their fishing occupation, equipment and productivity was included.

The southwestern coast of Puerto Rico where this study was conducted is the highest fish producing area on the island with 864,539 lbs. of fish caught during the year 1968-69. This represents 35.5% of the total catch on the island.

There are about 73 fishermen in Puerto Real who constitute about 9% of the population-18 years old and over; 19.5% of all those that are in the active labor force. In La Parguera and adjacent neighborhoods, there are about 95 men who are engaged

in fishing either as their main occupation, or as a part-time job. At El Combate, there are about 32 fishermen, that is, 45% of the population 18 years old and over. At Playa Guayanilla, there were reported 42 fishermen, 16% of those 18 years old and over.

Boats in these fishing villages are on the average about 16 to 25' in length which are propelled by inboard motors and sails. The most widely used fishing technique is by using "nasas". Each fisherman owns, on the average, from 30 to 50.

Six "municipios" at the southwestern coast of Puerto Rico were among the ten having the lowest fertility ratios in Puerto Rico. Playa Guayanilla had the lowest fertility ratio among the villages studied, with 550; La Parguera had 571; Puerto Real 585 and El Combate 923.

Among all the occupational groups studied in Puerto Real, laborers tended to show the highest fertility with 695, followed by other unskilled workers 621, and by fishermen, 613. This same pattern followed in Playa Guayanilla where farm laborers had 1333 fertility ratio. The other unskilled workers had 666 and the fishermen 516. At La Parguera, the skilled workers had the highest fertility ratio of 888, and the farm laborers the lowest, 222. Unskilled workers at La Parguera had 714 and the semi-skilled 250. El Combate skilled laborers had 1,000 fertility ratio and the fishermen 916.

No correlation was found in this study between school years completed and fertility ratio in any of the four fishing villages studied.

The higher the level of living of the population in Puerto Real, the lower the fertility ratio. Not all the level of living scores categories responded in this way in La Parquera, Playa Guayanilla and El Combate, but a general trend was observed in this direction.

The average number of people living in the same household was 4.3 at Puerto Real, 5.1 at La Parquera, 5.1 at Playa Guayanilla and 5.0 at El Combate. Among the occupational groups, fishermen had the highest average number of people in each household in Puerto Real with 4.9. El Combate had 5.3. The unskilled had the highest at La Parquera with 6.0; the semi-professionals with 7.0 were the highest at Playa Guayanilla.

Fishermen at Playa Guayanilla were 52 years old (on the average), the oldest occupational group among all the four villages. They were almost as old as the semi-skilled workers who had 51.4.

Puerto Real fishermen were on the average 45.5 years old, the oldest group in the village. They were, almost as old as the farm workers who were 44.5. At La Parquera, the oldest group, the farm workers, were 49 years old on the average.

Migration to the States is higher when there are fewer opportunities to earn a living in the community. In 31% of the houses interviewed at Puerto Real, some members of the family who used to live in the same house were now living in the United States. In Guayanilla, 16% of the households had

somebody living in the States; in La Parguera 15%, and in El Combate 6%.

Although the fishing occupation, as it is practiced today in Puerto Rico, does not provide enough income for their family, fishermen seemed to be satisfied with their jobs. Although 85% of the fishermen at Puerto Real thought the future looked uncertain, when they were asked what they would do if the situation gets worse, about half them answered that they would stay and continue fishing. This response was similar in Playa Guayanilla where the pollution from the nearby industrial plants is extinguishing the marine fauna and flora.

Fishermen seemed to be conscious of the uncertain future of this occupation. As a matter of fact, they have better aspirations for their children. Only two fishermen at Puerto Real, and 10 at Playa Guayanilla would like their children to be engaged in fishing as an occupation. Although Playa Guayanilla, at present, is a highly polluted bay for fishing, 50% of the fishermen have children that are following their father's occupation. However, only 20% of those in Puerto Real. The median number of living children per family in the four villages is 3. At Puerto Real 54.6% of the families have three children or less. About 12% have no children at all living at present. At El Combate 68% of the families have three children or less, the lowest among all the four villages. In La Parguera 46.2% of the families have 3 children or less. Playa Guayanilla had more children per household - but now, about 49.5% of the families have three children or less.

La Parquera showed the best living conditions of the four villages, as it was measured by the level of living scale used in this study. El Combate followed, then, Puerto Real and the last Playa Guayanilla. Among the occupational groups, the fishermen and the unskilled workers. The semi-skilled, the skilled and the semi-professionals did not show a consistent ranking among the four villages studied.

The median number of school years completed by all persons, 25 years and over, was 4.0 in Puerto Real, La Parquera and Guayanilla. El Combate had 5.0. The figures for the total population of Puerto Rico at this age in the year 1966 was 6.1. Close to 48% of the fishermen and 59% of the farm laborers had three years or less of school. Only about 25% of the other unskilled workers besides the fishermen and the farm laborers, had less than three years. The median number of school years completed by fishermen in all the villages was 3.

At Puerto Real, only about 54.6% of the heads of households belongs to the Catholic Church as compared with 72.6% in Playa Guayanilla; 78.8% in La Parquera and 87.5% at El Combate. At Puerto Real, about 22.8% of the heads of households were spiritists or practiced spiritists rites. In the other three villages, no spiritists were detected in the sample studied

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APPENDIX NO. 1

THE FISHING OCCUPATION AT PUERTO REAL, LA PARGUERA, PLAYA GUAYANILLA, AND EL COMBATE.

Boat Ownership	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Owned	33	66	15	----	17	60	16	64
Borrowed	4	8	1	6.0	1	4	1	4
Rented	--	--	1	6.0	--	--	1	4
Share basis	8	16	--	--	7	25	3	12
No boat	5	10	--	--	3	11	4	16
Total								
	50	100%	17	100%	28	100%	25	100%
Size of Boat (Length)								
Up to 5'	15	33	11	65	16	64	6	29
6 - 8'	19	42	5	29	3	12	11	52
9 - 12'	10	22	--	--	--	--	4	19
More than 12'	1	2	--	--	6	24	--	--
No answer	--	--	1	6	--	--	--	--
Total								
	45	99	17	100	25	100	21	100

Size of Boat (Length)	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Up to 12'	5	11	3	20	2	8	1	5
13 - 15	5	11	10	58	6	24	6	29
16 - 20	11	24	3	20	14	56	7	33
21 - 25	11	24	--	--	1	4	4	19
26 - 30	8	17	--	--	--	--	3	14
More than 30	5	11	--	--	2	8	--	--
No answer	--	--	1	2	--	--	--	--
<b>Total</b>	<b>45</b>	<b>98</b>	<b>17</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>21</b>	<b>100</b>

Method of Boat Propulsion

Method of Boat Propulsion	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Oar alone	9	20	2	12	1	4	--	--
Sail alone	--	--	--	--	--	--	--	--
Outboard motor	5	11	5	29	20	80	8	38
Inboard motor	6	13	1	6	--	--	2	10
Sail & outboard	3	7	8	47	--	--	--	--
Sail & inboard	22	48	1	6	4	16	11	52
<b>Total</b>	<b>45</b>	<b>99</b>	<b>17</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>21</b>	<b>100</b>

Fishing Equipment Owned	Playa			
	Puerto Real	La Parguera	Guayanilla	El Combate
	Num.	Num.	Num.	Num.
Nasas (Fishing Traps)				
1 - 10	5	1	16	5
11- 20	5	8	6	--
21- 30	10	5	--	--
31- 50	8	--	--	6
51- 80	5	--	6	3
81 or more	1	--	--	--
No answer	16	3	--	11
	50	17	28	25
Total	100	100	100	100
Chinchorros	4	7	7	11
Atarraya	15	4	12	6

Number of Persons that usually go in the Boat:	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
One	14	28	6	35	11	40	18	72
Two	28	56	9	53	8	28	3	12
Three	4	8	2	12	1	4	1	4
Four	1	2	--	--	6	21	--	--
	3	6	--	--	2	7	3	12
Total	50	100	17	100	28	100	25	100

Approximate Distance of Fishing Spot from Shore	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Less than 3 miles	11	22	6	34	17	61	4	16
4 - 8 miles	7	14	6	34	9	32	7	28
9 - 15 "	17	34	3	17	2	7	9	36
16 - 25 "	12	24	1	6	--	--	--	--
More than 25 miles	3	6	--	--	--	--	5	20
No answer	--	--	1	6	--	--	--	--
Total	50	100	17	97	28	100	25	100

Fishing Frequency	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Everyday	7	14	6	35	10	36	11	44
Four times a week	11	22	2	12	6	21	6	24
Three times a week	13	26	4	23	9	32	4	16
Twice a week	17	34	5	30	3	11	3	12
Other	2	4	--	--	--	--	1	4
Total	50	100	17	100	28	100	25	100

Usually Departing Time for Fishing

	Num.	%	Num.	%	Num.	%	Num.	%
12:00 - 1:00 A. M.	1	2	--	--	--	--	2	8
2:00 - 3:00 A. M.	23	46	3	17	3	11	12	48
4:00 - 5:00 A. M.	17	34	11	65	8	28	10	40
6:00 - 7:00 A. M.	4	8	--	--	8	28	--	--
8:00 - 9:00 A. M.	5	10	1	6	1	4	--	--
4:00 - P. M.	--	--	1	6	8	28	1	4
No answer	--	--	1	6	--	--	--	--
Total	50	100	17	100	28	99	25	100

Usual Arriving Time from Fishing	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
8:00 A. M.	--	--	1	6	12	43	--	--
9:00 - 10:00 A. M.	--	--	3	17	10	35	--	--
11:00 - 12:00 A. M.	20	40	5	29	--	--	5	20
1:00 - 2:00 P. M.	15	30	5	29	2	7	9	36
3:00 - 4:00 P. M.	3	6	--	--	--	--	5	20
6:00 - 7:00 P. M.	1	2	--	--	3	11	--	--
9:00 - 10:00 P. M.	9	18	1	6	--	--	4	16
- 11:00 P. M.	--	--	1	6	--	--	--	--
- 4:00 A. M.	--	--	1	6	1	4	--	--
After 3 - 4 days	1	2	--	--	--	--	2	8
No answer	1	2	--	--	--	--	--	--
Total	50	100	17	99	28	100	25	100

Time Span to arrive at Fishing Spot	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Less than 1 hr.	8	16	2	12	13	46	--	--
1 - 2 hrs.	17	34	15	88	12	42	19	76
3 - 4 hrs.	20	40	--	--	2	7	3	12
5 - 6 hrs.	3	6	--	--	--	--	--	--
More than 6 hrs.	1	2	--	--	--	--	2	8
No answer	1	2	--	--	1	4	1	4
Total	50	100	17	100	28	99	25	100

What Fishermen Do after arriving from Fishing	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Resting	35	70	2	12	14	50	14	56
Equipment Maintenance	4	8	9	53	2	7	4	16
Other jobs	10	20	3	17	10	36	--	--
Other things	1	2	3	17	2	7	7	28
Total	50	100	17	99	28	100	25	100

How often they Go to better fishing spots they know	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
never	21	42	3	17	7	25	3	12
Once in a while	23	46	7	41	16	57	16	64
Always	5	10	5	29	3	11	5	20
No answer	1	2	2	12	2	7	1	4
Total	50	100	17	99	28	100	25	100

Reasons why Fishermen Do not Fish more often in known Best Spots	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Age	5	10	1	6	1	4	--	--
Inadequate boats	15	30	1	6	8	28	4	16
Distance	4	8	4	23	9	32	3	12
Lack of equipment	1	2	--	--	--	--	--	--
Lack of time	5	10	--	--	--	--	7	28
Health	1	2	--	--	--	--	--	--
Others	17	34	11	65	6	21	5	20
No answer	2	4	--	--	4	14	6	24
Total	50	100	17	100	28	99	25	100



Conditions required for them to go to those better spots	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Adequate boats	15	30	6	35	17	61	7	28
Health	2	4	--	--	--	--	--	--
Better equipment	3	6	2	12	--	--	2	8
Better boats & equipment	4	8	--	--	--	--	--	--
Better weather	2	4	--	--	--	--	4	16
Others	15	30	9	53	11	39	5	20
None	5	10	--	--	--	--	--	--
No answer	4	8	--	--	--	--	7	28
Total	50	100	17	100	28	100	25	100

Amount of Fish caught by each Fisherman during Previous week of interview	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Nothing	1	2	--	--	3	11	--	--
Less than 59 lbs.	9	18	--	--	5	18	--	--
50 - 100 lbs.	7	14	3	17	--	--	4	16
1 - 3 qq.	11	22	5	30	--	--	10	40
4 - 8 qq.	5	10	--	--	--	--	9	36
9 - 10 qq.	1	2	--	--	--	--	--	--
No answer	16	32	9	53	20	71	2	8
Total	50	100	17	100	28	100	25	100

Fishermen's opinions as to best months for Fishing	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
July - October	27	--	--	--	4	14	--	--
August	4	--	--	--	--	--	--	--
June - August	7	--	--	--	--	--	--	--
December - June	7	--	--	--	--	--	--	--
June - September	--	--	7	41	3	11	13	52
October - December	--	--	1	6	11	39	10	40
January - February	--	--	2	12	3	11	2	8
Others	--	--	7	41	7	25	--	--
No answer	5	--	--	--	--	--	--	--
Total	50	--	17	100	28	100	25	100

Amount Average Catch During Best Months	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Less than 50 lbs.	8	16	6	35	16	57	12	42
1 - 3 qq.	26	52	6	35	1	4	13	58
4 - 6 qq.	3	6	3	17	--	--	--	--
50 lbs. - 100 lbs.	4	8	--	--	--	--	--	--
Do not know	5	10	--	--	3	11	--	--
Others	3	6	--	--	--	--	--	--
No answer	1	2	2	12	8	28	--	--
Total	50	100	17	99	28	100	25	100

Fishermen's opinions as to the worst months for Fishing	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
December - April	12	24	--	--	--	--	17	68
January - March	8	16	7	41	10	36	--	--
May - June	6	12	--	--	10	36	8	32
February - March	16	32	2	12	4	14	--	--
August	3	6	8	47	--	--	--	--
October	2	4	--	--	--	--	--	--
No answer	3	6	--	--	4	14	--	--
Total	50	100	17	100	28	100	25	100

Amount average catch during the worst months	Puerto Real		La Parguera		Playa Guayanilla		El Combate	
	Num.	%	Num.	%	Num.	%	Num.	%
Less than 50 lbs.	17	34	11	65	12	42	5	20
50 - 100 lbs.	8	16	5	29	4	14	7	28
100 - 300 lbs.	13	26	--	--	1	4	13	52
4 - 6 qq.	--	--	--	--	--	--	--	--
Do not know	8	16	1	6	3	11	--	--
No answer	1	2	--	--	2	7	--	--
Other	1	2	--	--	2	7	--	--
Total	50	100	17	100	28	99	25	100

Fishermen's opinions as to changes detected by themselves to the amount of catch during last years

	%		%		%	
	Num.	%	Num.	%	Num.	%
Increased	39	78	16	94	--	--
Decreased	10	20	1	6	28	100
No answer	1	2	--	--	--	8
Total	50	100	17	100	28	100

# Mona Passage (Canal de la Mona)

