

AGENCY FOR INTERNATIONAL DEVELOPMENT  
 WASHINGTON, D. C. 20523  
**BIBLIOGRAPHIC INPUT SHEET**

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1. SUBJECT CLASSIFICATION	A. PRIMARY Agriculture
	B. SECONDARY Fisheries

2. TITLE AND SUBTITLE  
 Technological change and space-time use in an artisan fishing occupation

3. AUTHOR(S)  
 Spaulding, I.A.

4. DOCUMENT DATE 1974	5. NUMBER OF PAGES 30 p.	6. ARC NUMBER ARC
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7. REFERENCE ORGANIZATION NAME AND ADDRESS  
 International Center for Marine Resources and Development.  
 University of Rhode Island, Kingston, Rhode Island 02881

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)

9. ABSTRACT

"Artisan fishermen" is a term applied to fishermen who rely more on craft skills and animate power than on mechanization and inanimate power in their occupational activity; for them living is characteristically at a subsistence level. The purpose of this research was to examine relationships between use of space and of time in an occupational activity and technological changes related to that occupational activity. The hypothesis examined was that technological change can accompany alterations in orientation to and use of space and time related to an occupational activity. Perspective on space-time orientation and use is taken with the following concept of a social system: human organisms mutually involved and synchronized with each other and a given environmental context. This study was conducted in a fishing village on the west coast of Puerto Rico. Data were secured by interview; a total of 40 interviews was made. The data presented here are from interviews with 27 artisan fishermen, constituting 67.5% of the persons interviewed; 32.5% were engaged in non-fishing occupations.

10. CONTROL NUMBER PN-AAC-161	11. PRICE OF DOCUMENT
12. DESCRIPTORS Job analysis Machinery Puerto Rico Rural sociology	13. PROJECT NUMBER Technological change
	14. CONTRACT NUMBER CSD-2455 211(d)
	15. TYPE OF DOCUMENT

CSO-2056-113  
PN-AAC-101

TECHNOLOGICAL CHANGE AND SPACE-TIME USE  
IN AN  
ARTISAN FISHING OCCUPATION\*

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\*This study was sponsored by the International Center for Marine Resource Development and the Agricultural Experiment Station of the University of Rhode Island; their respective projects were: the Puerto Rico Marine Fisheries-Mariculture Development Project and NF-127, A Research and Development Mariculture-Fisheries Project in Puerto Rico. AES Contribution No. ~~1686~~ 1686 1974

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## Heading Outline

Purpose

Hypothesis

Setting

Data Collection

Artisan Fishermen

Conceptual Orientation

Perspective on Past and Future Change

Technology and Space-Time Use

    Current relationships

    Perspective on modification of current space-time use

    Limitations on extending distance and time

    Relative influence or restraints on space-time use

        Perspective

        Restraints on modification of current space-time use

        Restraints on extension of distance and time

    Informants' willingness to extend space-time use

Interpretation

## Technological Change and Space-time Use in an Artisan Fishing Occupation

### Purpose

The purpose of this research was to examine relationships between use of space and of time in an occupational activity and technological changes related to that occupational activity.

### Hypothesis

The hypothesis examined was that technological change can accompany alterations in orientation to and use of space and time related to an occupational activity.

### Setting

The study was conducted in a fishing village located on the west coast of Puerto Rico and identified fictitiously as Cerro Pueblo.

### Data Collection

Data were secured by interview, with the assistance of an interpreter, from household heads in 62.5% of the occupied dwellings in the village during August, 1973. A total of 40 interviews was secured. The data presented here are from interviews with 27 artisan fishermen, who constitute 67.5% of the persons interviewed; 32.5% were engaged in non-fishing occupations.

### Artisan Fishermen

"Artisan fishermen" is a term applied to fishermen who rely more on craft skills and animate power than on mechanization and inanimate power in their occupational activity; for them living is characteristically at a subsistence level. The fishermen interviewed in this research had, during the prior fifteen years, adopted outboard motors; during the prior five years, inboard motors had been acquired by two; at least three men in the village, not all household heads, had adopted scuba diving gear. Increasingly, fish were captured for sale.

### Conceptual Orientation

Perspective on space-time orientation and use is taken with the following concept of a social system: human organisms mutually involved and synchronized with each other and a given environmental context. Several types of evidence provide a basis for the concept. Among them is that pertaining to the cira diurnal rhythms of living organisms, their overt expression, and their entrainment; the circadian periodicities can be manipulated, within limits, by manipulating the rhythms of the environmental setting with which the organism is involved and its periodicities entrained. (Menaker, 1971; Wolff, 1962). This synchronization is consistent with informa-

tion pertinent to other aspects of rhythm in human functioning; generally, reference can be made of the field of kinesiology and its implications for body locomotion, however perfunctory, meticulous, aesthetic, or athletic. (Rasch, 1967; Scott, 1963; Wells, 1955). In communication among mutually involved organisms similar responses to "significant symbols" (Mead, 1934) allow for continuities of meaning through synchronization of movement; Korzybski (1941) makes observations on the time-binding function of language; in the field of proxemics evidence shows the existence of various tolerated distances between interacting persons; these discernable limits in the spatial aspect of mutual involvement are related to communication. (Hall, 1959; 1966). Communication, then, is both time-binding and space-binding.

Research indicates that, in the context of a given environmental setting, people experience distances and periodicities as functioning to facilitate and restrain behavior within limits of ranges of distance, of intervals of recurrent relationships ("time" intervals), and of conceptual and feelingful orientations to those ranges and intervals. (Somers, 1969; Yaker, et al., 1971). The scope of this perspective ranges from macro- to micro-. On the one hand, Innes (1951) interprets historical evi-

dence as indicating that the development and demise of a civilization is related to the time- and space-binding properties, i.e., "elements which make for duration and extension" (Innes, 1951, 133), of its systems of communication. On the other hand, Ross (1970) has explored variation among space-time binding characteristics of art objects and their component materials as media of communication. Fleming and Jeffrey (1964) report that distance and time (along with income) can serve as restraints on individual (consumer) behavior. Restraining influences of distances and periodicities are also indicated by evidence supporting the premise that a feeling of being "out of contact" with other people is a motivating influence on communicative behavior (Spaulding, 1960) and by evidence of man's limited ability to adapt to rapid change, the phenomenon of "future shock" (Toffler, 1970). Evidence from these types of investigations and observations is the basis for use of the above concept of a social system. Additional support for the conceptual perspective is provided by the following, inter alia: (Cannon, 1932; 1953; Goldstein, 1939; Hebb, 1949; Klineberg, 1954; Lowen, 1958; Meyer, 1956; Noyes, 1948; Sullivan, 1953; Wolff, 1948).

## Perspectives on Past and Future Change

On the basis of a past-future aspect of time orientation, informants were asked two related questions:

1. "In what way(s) has fishing changed for you during the past five years? (Follow-up intervals: 10 years? 15 years? 20 years? 25 years? Ever?)"

2. "What changes in fishing do you expect in the future?"

Responses are reported in Table 1 and reflect variation between past experience and expectations for the future. Observation of changes during the prior five years tended to reflect concern with over-all reduction in fish stock and catch (60.4%) and with increased commercialization of fishing (33.3%); concern with changes in boats and equipment was reflected in only 6.3% of the observations. Expectations for the future reflected continued concern with commercialization (17.5%) and concern with increased government support and regulation of fishing (17.5%); in combination, they reflected almost the same frequency of concern expressed about changes in boats and equipment (32.5%). The 27.5% of the observations reflecting concern with stock and catch were almost equally divided between those optimistic and those pessimistic about the future quality and quantity of stock and catch. Only 5.0% expressed concern with long-range climatic



changes and ocean currents which would influence fish stocks. (Table 1 near here)

#### Technology and Space-time Use

##### Current relationships

In their occupational activity, the informants were users of fish traps, lines (fabric and wire) and nets; the boats they used varied in length from 14 to 38 feet, with an average length of 18.1 feet. Two boats of over 30 feet in length had sails and inboard motors of 46 and 80 horsepower. Boats under 30 feet in length, of which the longest was 20 feet, were powered with outboard motors having from 16 to 40 horsepower. The average horsepower for all boats was 26.5. For boats under 30 feet in length, the mean length was 16.6 feet and the mean horsepower of motors was 23.6.

To fish, most informants went off-shore during day light hours from 3 to 6 times a week. Their off-shore distances ranged from 2.5 miles to 17.5 miles and averaged 7.1 miles. Single trips varied in time from 2.5 to 11.0 hours, with an average of 6.8 hours. A trip could begin as early as 3:30 a.m. and as late as 9:00 a.m.; most informants began between 5:00 and 6:00 a.m. The hour of return from a trip varied from 9:00 a.m. to 3:00 p.m.

Characteristically, but not exclusively, a single trip was into an area located off a southwestern cape of Puerto Rico. Of the reasons given by the informants for fishing in that area, 50.0% pertained to the assertion that because of rock formations and reefs fish existed there and could be caught there. As many as 28.6% indicated that their boats were too small, inadequately powered, and inadequately equipped to go elsewhere. And 21.4% indicated that they liked it, knew the area, or regarded it as "the area" for Cerro Pueblo fishermen (with territorial implications).

Of reasons given for not fishing elsewhere, 62.1% pertained to the smallness of the boats and the inadequacy of equipment. Knowing the area, liking it, and regarding it as "territory" for the village fishermen accounted for 24.1% of them; environmental characteristics, i.e., wind and rough water, and increased cost each accounted for 10.4%. Only 3.0% of the reasons pertained to the availability of fish in the area.

Perspectives on modification of current space-time use

To elicit information about relationships between technology and space-time use, information was first secured from each informant about usual distances and time intervals spent fishing. Each was then asked two

questions pertaining to modification of distances:

- a. "How would you feel about going out a longer distance to fish?"
- b. "How would you feel about going out a shorter distance to fish?"

In addition, each was asked two questions pertaining to modification of intervals of time used in catching fish:

- c. "How would you feel about staying out more time?"
- d. "How would you feel about staying out less time?"

Responses to questions about modifying distances and time intervals are shown in Table 2 and Table 3. Answers were favorable, unfavorable, or ambivalent. Table 2 shows that 79.3% of the responses favored lengthening distances, while 20.7% of the responses did not favor lengthening distances. Approval of shortening distances was shown in 25.0% of the respective responses, while disapproval was shown in 64.3% of them. Almost 11.0% of the responses pertaining to shortening distances were ambivalent. Table 3 shows that, with respect to lengthening time, slightly over half (53.3%) of the responses were favorable, while 40.0% were unfavorable; for shortening the length of time, also, slightly over half

(51.7%) of the responses were favorable and 41.4% were unfavorable. For each modification in time, almost 7.0% of the responses showed ambivalence.

(Table 2 near here)

(Table 3 near here)

The data give pronounced indication of willingness to extend off-shore distances and more limited willingness to increase time used fishing.

#### Limitations on extending distance and time

Since fishermen held that fish were available in areas which were at greater distances than they usually went, questions were asked to ascertain factors limiting extension of distance and of time. With respect to distance, informants were asked:

- a. "How many miles from shore do you usually go, when you fish?"
- b. "How many more miles from shore would you be willing to go?"
- c. "Why would you go no farther?"

With respect to time, informants were asked:

- a. "When fishing, you usually stay out about \_\_\_\_\_ hours?"
- b. "How many more hours would you be willing to stay out with your boat to keep on fishing?"

c. "Why would you stay out no longer?"

Informants' responses to the b and c questions are reported in Table 4 and Table 5.

In Table 4, rationales for not going farther off-shore are related to the number of miles the informants were willing to extend their off-shore distances. Distance extension ranged from 0 miles for 7 informants, through 1 to 25 miles for 7 informants, to unlimited distance for 13 informants. For those indicating specific extensions of distance, i.e., 1 to 25 miles, the mean distance was 10.28 miles. Limitations pertained primarily to boats and equipment (64.3%), and catch (25.0%); a few pertained to family relationships and influences of the environmental setting (10.7%).

In Table 5, rationales for not extending the duration of intervals at sea are related to the number of hours the informants were willing to extend their intervals at sea. Time extensions ranged from 0 hours for 8 informants, through 2 to 6 hours for 14 informants, to unlimited time for 5 informants. For informants indicating extensions of 2 to 6 hours, the mean extension was 3.39 hours. Limitations which were emphasized predominantly were tension management (31.4%), influences of the environment (28.6%), and boats and equipment (25.7%). Emphasized less are family relationships and catch (14.3%).

(Table 4 near here)

(Table 5 near here)

Relative influence of restraints on space-time use  
Perspective

In examining the relative prevalence with which restraints on space-time use are indicated, use was made of a system of categories derived from responses to interview questions. Systematically, they can be arranged in the following sequence: tension management, boat size and equipment, environmental processes, institutional involvement, and catch. In this sequence, they relate to a person-object involvement (person-fish) of a type essential, in the social context, for securing a product to sell and for securing food. As a product for sale, fish contribute to economic functions and as food they contribute to tension management functions. The activity of securing fish (catch) is carried out with artifacts (boats and equipment) in the context of non-human (environmental processes) and human (institutional involvements) environmental influences.

The arrangement is based on the concept of a social system stated above and H. S. Sullivan's principle of situation integration-resolution (Sullivan, 1953; 92-94). An underlying assumption is that for a routine of behavior to be retained in a social system it has to contribute within a given interval to tension management

for social system members as individuals and to a function essential for the operation of the system. Sullivan's perspective on tension management is enlarged to encompass management of euphoria as well as tension and management of coordinating processes of conceptualization related to object involvement (Spaulding, 1970; 4-6); the processes of conceptualization pertinent here are relevant to cognitive mapping, boundary maintenance, and territoriality as described by Loomis and Loomis (1961; 5, Fig. 1). Since the informants indicated that all the fish they caught were disposed of by sale or by use as food in their own or friends homes, economic functions, as well as tension management, are regarded as associated with fishing activity. Within this arrangement, fishing activity is facilitated and restrained in space-time relationships.

#### Restraints on modification of current space-time use

Matrix A, below, shows the number of times each type of restraint on modifying current space-time use was mentioned by informants; see Table 2 and Table 3. To the extent that prevalence may be associated with degree of influence, the data indicate that quantity and quality of catch, boat size and equipment, and tension management have more influence on space-time use (84.5%)

Matrix A

<u>Influencing Factors</u>	<u>Space Use</u>		<u>Time Use</u>		<u>Total</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Tension management	14	24.6	12	20.3	26	22.4
Boat size and fishing equipment	13	22.8	13	22.0	26	22.4
Institutional activities and involvements	2	3.5	8	13.6	10	8.6
Environmental processes	-	-	8	13.6	8	6.9
Quantity and quality of catch	<u>28</u>	<u>49.1</u>	<u>18</u>	<u>30.5</u>	<u>46</u>	<u>39.7</u>
	57	100.0	59	100.0	116	100.0

$\chi^2 = 22.093054$ ;  $df = 5$ ;  $P < 0.001$ .

than institutional activities and involvements and environmental processes (15.5%). For each, use of space and use of time, the greatest influence was catch; the influence of catch is greater on use of space than on use of time. The influence of boat size and equipment was essentially the same for each, while tension management was slightly more influential on use of space than on use of time. The influence of institutional activities and involvements and of environmental processes was greater for use of time than for use of space; environmental processes were not reported as influencing use of space. The relationship among restraints with respect to their influence on use of space and use of time is significantly different from a chance relationship.



### Restraints on extension of distance and of time

Matrix B shows the number of times each type of restraint was reported in association with extensions of space-time use; see Table 4 and Table 5. The data

Matrix B

Influencing Factors	Space Use		Time Use		Total	
	No.	%	No.	%	No.	%
Tension management	-	-	11	31.4	11	17.2
Boat size and fishing equipment	19	65.5	9	25.7	28	43.8
Institutional activities and involvements	1	3.5	2	5.7	3	4.7
Environmental processes	2	6.9	10	28.6	12	18.7
Availability of catch	<u>7</u>	<u>24.1</u>	<u>3</u>	<u>8.6</u>	<u>10</u>	<u>15.6</u>
	<u>29</u>	<u>100.0</u>	<u>35</u>	<u>100.0</u>	<u>64</u>	<u>100.0</u>

$\chi^2 = 20.2681$ ;  $df = 4$ ;  $P < 0.001$ .

indicate that of all types of restraints, inadequate boat size and equipment has the greatest influence (43.8%) on extending space-time use. Environmental processes (18.7%); tension management (17.2%), and availability of catch (15.6%) are similar in the extent of their influence, but vary according to the above sequence. Use of space and use of time differ with respect to predominant restraints on their extension. For extending use of space, the most influential (65.5%) restraint is boat size and equipment; the second (24.1%) is availability

of catch. These two account for 89.6% of the restraining influence on extending use of space. For extending use of time, the most influential (31.4%) restraint is tension management, followed by environmental processes (28.6%) and boat size and equipment (25.7%). In combination, these three account for 85.7% of the restraining influence on extending use of time. Institutional activities and involvements were least influential on extending use of time, while tension management was not reported as influencing use of space. The relationships among these restraints with respect to their influence on restraining an extension of use of space and of use of time is significantly different from a chance relationship.

Informants' willingness to extend space-time use

Table 5 and Table 6 show the number of informants associated with each extension of distance and of time interval. The informants, arrayed by combinations of distance and time extensions, show the following characteristics:

Matrix C

<u>Space-time extensions</u>		<u>Informants</u>				
<u>Distance</u>	<u>Time</u>	<u>No.</u>	<u>Per cent</u>	<u>Sub-totals</u>	<u>Equally distributed</u>	
					<u>No.</u>	<u>Per cent</u>
<u>Both</u>						
Unlimited	Unlimited	4	14.8			
Limited	Limited	4	14.8			
Unlimited	Limited	6	<u>22.3</u>	(14; 51.9%)	9	33.3
<u>Space extension only</u>						
Unlimited	None	3	11.1			
Limited	None	3	11.1			
<u>Time extension only</u>						
None	Unlimited	1	3.7			
None	Limited	4	14.8	(11; 40.7%)	9	33.3
<u>No extensions</u>						
None	None	<u>2</u>	<u>7.4</u>	( 2; 7.4%)	<u>9</u>	<u>33.4</u>
		<u>27</u>	<u>100.0</u>		<u>27</u>	<u>100.0</u>

For sub-totals and equal distribution of informants:  $X^2=5.7415$ ;  
 $df=2$ ;  $P < 0.10$ . At 0.05,  $X^2=5.991$ .

Willingness to extend both distance and time is indicated by slightly more than half (51.9%) of the informants; extension of distance or time is expressed by slightly less than one half (40.7%) of them. Only 7.4% indicated extension of neither. When compared with a distribution of the informants equally allocated among the three combinations, the relationship differs significantly from chance arrangement at slightly more than the 0.05 level.

### Interpretation

Data presented here indicate that for the informants a configuration of space-time use and orientation is being disturbed by the depletion of fish stock in an area where fishing has customarily been done. This depletion constitutes a threat to the continuation of fishing, as it has been done in the past. On the basis of the premise that synchrony tends to characterize movement of the human being and its environmental context, it is reasonable to expect, in these circumstances, the occurrence of changes which would re-establish a functionally coordinated relationship between use of space and use of time. The most prevalent future change expected by the informants is in size of boats and adequacy of equipment for contact with fishing areas where stock is available.

The data indicate that, with respect to existing fishing routines, boats and equipment have a relatively similar degree of influence as a restraint on use of space and use of time. In Matrix A, boats and equipment account for 22.8% of the reported restraints on use of space and 22.0% of those on use of time. No other restraint shows this relative uniformity, which is evaluated as reflecting the functionally coordinated space-

time binding characteristics of boats and equipment in an on-going fishing operation.

In Matrix B, the data indicate that, with respect to extending space-time use, boat size and equipment was the most frequent type of restraint, being more than twice as influential as any other. This relationship exists despite the relatively greater amount of influence boats and equipment have on extending use of space (65.5%) than on extending use of time (25.7%).

The data in Matrix C indicate that the proportion of informants willing to extend their use of space and of time exceeded that which might occur by chance.

Under these circumstances, it would be reasonable to predict that larger boats and refrigeration equipment, along with cooking facilities, winches, and an increased number of fish traps, inter alia, would be adopted by the informants if they were available. Their future availability was viewed by some informants (17.5%, Table 1) as contingent upon government loans and regulations. Others, however, not having the capital with which to purchase a large boat and not waiting for government loans, built their own craft, which was 56 feet in length, had a 16 foot beam, and had a combined draft and free board amidship of 9 feet. The hull of this craft was nearing completion at the time of my second visit to the village

of Cerro Pueblo; when I made a third visit five months later, the hull had been caulked, painted, and launched. Rigging and outfitting remained to be completed.

The craft was about  $1\frac{1}{2}$  times as long as the next largest boat in the village. It was regarded by its builders as having space-time binding capabilities which would allow them to continue their function as fishermen.<sup>1/</sup> They described it as big enough to be provisioned for more than a week and as capable of inter-island cruising in the Carribbean Sea.

This description of space-time binding capabilities, as perceived by the craft's builders, does not coincide exactly with descriptions of distance and time extensions which the informants indicated, in response to structured inquiry, that they were willing to undertake. The craft's capabilities are not described as unlimited, but they exceed the 25 mile maximum specific extension of distance and the 6 hour maximum specific extension of time. When allowance is made for the variation in description, the space-time binding capabilities of the craft are regarded as reflecting its builders' orientation to a system of space-time use which would allow them to continue their function as fishermen. Indications that the craft's capabilities exceed most of the ranges of modification its builders and other informants were

willing to make raise questions about the eventual characteristics of the space-time orientation with which use of this and other large craft will ultimately be facilitated and restrained. Yet, information about this boat, along with the data presented here pertaining to restraints on routines of space-time use and their extension, support the hypothesis that technological change can accompany alterations in orientation to and use of space and time related to an occupational activity.

Table 1. Changes in Fishing During Prior Five Years and Expected in the Future; 27 Artisan Fishermen, Cerro Pueblo, Puerto Rico; August, 1973

Changes	Intervals					
	Past		Future		Total	
	No.	%	No.	%	No.	%
Boats and equipment						
Boats	2		5		7	
Equipment	<u>1</u> <u>3</u>	6.3	<u>8</u> <u>13</u>	32.5	<u>9</u> <u>16</u>	18.2
Environmental processes	<u>0</u> <u>0</u>	0.0	<u>2</u> <u>2</u>	5.0	<u>2</u> <u>2</u>	2.3
Institutional involvements						
Economic: costs and prices	7		2		9	
profits	6		1		7	
fishermen/buyers	3 <u>16</u>	33.3	4 <u>7</u>	17.5	7 <u>23</u>	26.1
Governmental: loans	-		5		5	
regulation	- <u>0</u>	0.0	<u>2</u> <u>7</u>	17.5	<u>2</u> <u>7</u>	8.0
Stock and catch						
Less stock or none	13		5		18	
Less catch	12		1		13	
Same catch	3		-		3	
More catch	1		3		4	
More stock	- <u>29</u>	<u>60.4</u>	<u>2</u> <u>11</u>	<u>27.5</u>	<u>2</u> <u>40</u>	<u>45.4</u>
Total	48	100.0	40	100.0	88	100.0

$\chi^2 = 26.4161$ ;  $df = 4$ ;  $P < 0.001$



Table 2. Feelings About Going Longer and Shorter Distances From Shore to Fish; 27 Artisan Fishermen, Cerro Pueblo, Puerto Rico; August, 1973

Rationale	Change of Distance and Feeling						Total No. %		
	Longer			Shorter					
	Favorable	Unfavorable		Favorable	Unfavorable				
Tension Management	-	-	-	-	-	-	-	14	24.6
Knowledge of other fishing areas	Known or learned 3	Not Known 2		-		Not Known 1			
Feeling at sea	Like 4	Dislike -		Like 3		Dislike 1			
Boat Size and Fishing Equipment	-	-	-	-	-	-	-	13	22.8
	With bigger boat 9	Boat too small 2		-		Not right equipment 2			
Institutional Involvements	-	-	-	-	-	-	-	2	3.5
Onshore activity	-	-		Fix equipment 1		Come ashore and drink beer 1			
Quantity and Quality of Catch	-	-	-	-	-	-	-	28	49.1
	If, or will catch more 7	Won't catch more 2		If catch enough 3		Won't catch * catch enough (f) 3 13			
Total Percent	23 40.3	6 10.5		7 12.3		3 5.3	18 31.6	57	100.0
Total for each modification	N 29 % 79.3	% 20.7		N 28 % 25.0		% 10.7 % 64.3			

\*Ambivalent

Table 3. Feelings about Staying at Sea Longer and Shorter Time Intervals to Fish; 27 Artisan Fishermen, Cerro Pueblo, Puerto Rico; August, 1973

Rationale	Change of Time Interval and Feeling								No.	%	
	Longer				Shorter						
	Favorable	Unfavorable	Favorable	Unfavorable	Favorable	Unfavorable	Favorable	Unfavorable			
Tension Management	-	-	-	-	-	-	-	-	-	12	20.3
Physical condition	-	Hungry	-	-	Sickness; fatigue	-	-	-	-	12	20.3
	-	2	-	-	2	-	-	-	-		
Feeling at sea	Like	Dislike			Like	(/)* Dislike					
	1	1			2	2	2				
Boat Size and Fishing Equipment	-	-	-	-	-	-	-	-	-	13	22.0
	If, bigger boat, and more equipment										
	9	2			2						
	If, bigger Small boat; need refri- gerator using lines										
Insitutional Involvement	-	-	-	-	-	-	-	-	-	8	13.6
Onshore groups		Buyer; family									
		2									
Exchange	If making money				If making money	Won't make money					
	2	-			2	2					
Environmental Processes	-	-	-	-	-	-	-	-	-	8	13.6
Decay	-	Fish rot in heat at sea			-	-	-	-	-		
	-	2			-	-					
Weather	Good	(/)*Bad			Bad						
	1	1	1		3						
Quantity and Quality of Catch	-	-	-	-	-	-	-	-	-	18	30.5
	If enough ( / ) * in catch										
	3	1	2		4	8					
Total	16	2	12		15	2	12			59	
Percent	27.1	3.4	20.3		25.5	3.4	20.3			100.0	
Total for each modification	N	%	%	%	N	%	%	%			
	30	53.3	6.7	40.0	29	51.7	6.7	41.4			

\*Ambivalent

Table 4. Limitations on Extending Distances from Shore, Classified by Extended Distances; 27 Artisan Fishermen, Cerro Pueblo, Puerto Rico; August, 1973

Extended Distance in Miles	Rationale For Not Going Farther	No.	%
	(0; 7 informants; 25.9%)		
0	-----	7	24.0
	<u>be*</u> Boat too small (1)		
	<u>be</u> Need different equipment at greater depth (1)		
	<u>ii</u> Would miss family (1)		
	<u>c</u> No fish farther out (3)		
	<u>c</u> Will go farther along shore, but not out (1)		
	(1 to 25; 7 informants; 25.9%; mean, 10.28 miles)		
1,2	-----	1	3.5
	<u>c</u> No fish farther out (1)		
2,5	-----	1	3.5
	<u>c</u> Farther out, too deep for the kind of fish we are after (1)		
5	-----	1	3.5
	<u>be</u> Farther out, water is too deep for our lines (1)		
10	-----	3	10.3
	<u>be</u> Boat is inadequate (1)		
	<u>ep</u> Too far to get fish back without spoiling (1)		
	<u>c</u> Farther out, no fish (1)		
20	-----	2	6.9
	<u>be</u> Boat is inadequate (1)		
	<u>ep</u> Depth is too great for diving (1)		
25	-----	1	3.5
	<u>be</u> Boat is not large enough (1)		
No Limit	(no limit; 13 informants; 48.2%)		
	-----	13	44.8
	<u>be</u> Boat and/or equipment not adequate		
Total		29	100.0

\*tm - tension management  
 be - boat, equipment  
 ep - environmental processes  
 ii - institutional involvements  
 c - catch

Table 5. Limitation on Extending Time at Sea, Classified by Extended Time Intervals; 27 Artisan Fishermen, Cerro Pueblo, Puerto Rico; August, 1973

Extended Time In Hours	Rationale for Not Staying Longer	No.	%
0	(0; 8 informants; 29.6%)	12	34.2
	<u>tm*</u> Fatigue (2)		
	<u>tm</u> Too hot (2)		
	<u>tm</u> Hungry (2)		
	<u>be</u> No cooking and refrigeration equipment (1)		
	<u>ep</u> Weather gets rough (1)		
	<u>ep</u> Sun spoils fish (2)		
	<u>ii</u> Concern for family (1)		
	<u>c</u> No more time needed to catch what I need (1)		
2	(2 to 16; 14 informants; 51.9%; mean, 3.39 hours)	3	8.6
	<u>tm</u> Fatigue (1)		
	<u>be</u> Not enough traps (1)		
	<u>ep</u> Sun spoils fish (1)		
2,3		3	8.6
	<u>tm</u> Work gets rough (1)		
	<u>ep</u> Weather gets rough (1)		
	<u>c</u> Would not increase catch (1)		
3		5	14.3
	<u>tm</u> Too much work (1)		
	<u>tm</u> Too hot (1)		
	<u>ep</u> Sun spoils fish (1)		
	<u>ep</u> Darkness and dangerous travel (1)		
	<u>ii</u> Worried family (1)		
4		5	14.3
	<u>be</u> No food and refrigeration equipment; too few traps (1)		
	<u>be</u> No food and refrigeration equipment (1)		
	<u>ep</u> Sun spoils fish (2)		
	<u>ep</u> Darkness and dangerous work (1)		
4,5		1	2.9
	<u>c</u> Fish stop biting (1)		
6		1	2.9
	<u>tm</u> Fatigue (1)		
No Limit	(no limit; 5 informants; 18.5%)	5	14.2
	<u>be</u> No food and refrigeration equipment; boat small (3)		
	<u>be</u> No food and refrigeration equipment (1)		
	<u>be</u> No refrigeration (1)		
	<b>Total</b>	<b>35</b>	<b>100.0</b>
	*tm - tension management	ii - institutional involvement	
	be - boat, equipment	c - catch	
	ep - environmental processes		

### Footnote

1. The builders of this craft were a family of high prestige within the village and were part of the direct lineage of the village founder; among them, during an interval of slightly more than 50 years, male family members who lived in the village had engaged in fishing as an occupation.

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