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**Perceptions of Fishermen's Cooperatives by Small-Scale Fishermen  
in the Republic of Panama**

by

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INTRODUCTION Many governments, international organizations, and individuals view the fishermen's cooperative as the ideal means of improving small-scale fisheries. In some cases marked success has been reported (FAO 1971) and in others, failure. The successes have led many governmental and international aid organizations to make release of development funds contingent upon formation of fishermen's cooperatives for management purposes. This has led to increased pressure, in many instances, with regard to attempts to institute cooperative organizations. In many instances this type of organization is novel and can be regarded as an innovation. The institution of fishermen's cooperatives in these circumstances can thus be conceptualized as a problem dealing with the diffusion of an innovation, and with regard to an innovation's acceptance Rogers and Shoemaker write that "it is the attributes of a new product, not as seen by the experts but as perceived by the potential adopters, that really matters." Foster (1973:130) puts it more succinctly when he writes:

When people are confronted with new opportunities, acceptance or rejection depends not only upon the basic cultural articulation, a favorable pattern of social relations, and economic possibility, but also upon psychological factors. How does the novelty appear to the individual? That is, how does he perceive it? Does he see it in the same light as the technical specialist who presents it to him? Does it convey the same message?

Further, Levine (1973: 146-147) provides a theoretical discussion of how cultural material is cognitively transformed when it is introduced into a

group from the outside. It is therefore important to determine how the individual fisherman perceives a fishermen's cooperative organization.

An awareness of these perceptions is important for several reasons: first, it helps us understand fishermen's attitudes concerning cooperatives; second, it facilitates recognition of potential areas of dissonance resulting from perceptions that do not match the real effects of cooperatives; and third, it aids in developing information programs which will result in more realistic perceptions of the effects of fishermen's cooperatives, thus enhancing their chances of success.

This paper describes fishermen's perceptions of fishermen's cooperative organizations in the Republic of Panama. These perceptions are examined in relationship to other sociocultural variables to determine their interrelationships in an attempt to account for variability in the conceptualization of this type of organization. Results are examined and suggestions made concerning possible action to improve problem areas.

#### METHODS

SAMPLE The sample consists of 153 artisanal fishermen from the Republic of Panama. Fishermen were interviewed in a wide range of locations extending from Colon on the Atlantic coast to Panama City on the Pacific, and at numerous locations along the Pacific Coast from Panama City to the Costa Rican border (see Figure 1). Several of the locations had operative cooperative or pre-cooperative organizations (La Playita, Chorillo, Boca Parita, La Enea, Pedregal), and at some, fishermen's organizations had failed (Puerto Armuelles, Remedios, Farallon). Forty-eight percent of the sample were either cooperative or pre-cooperative members.

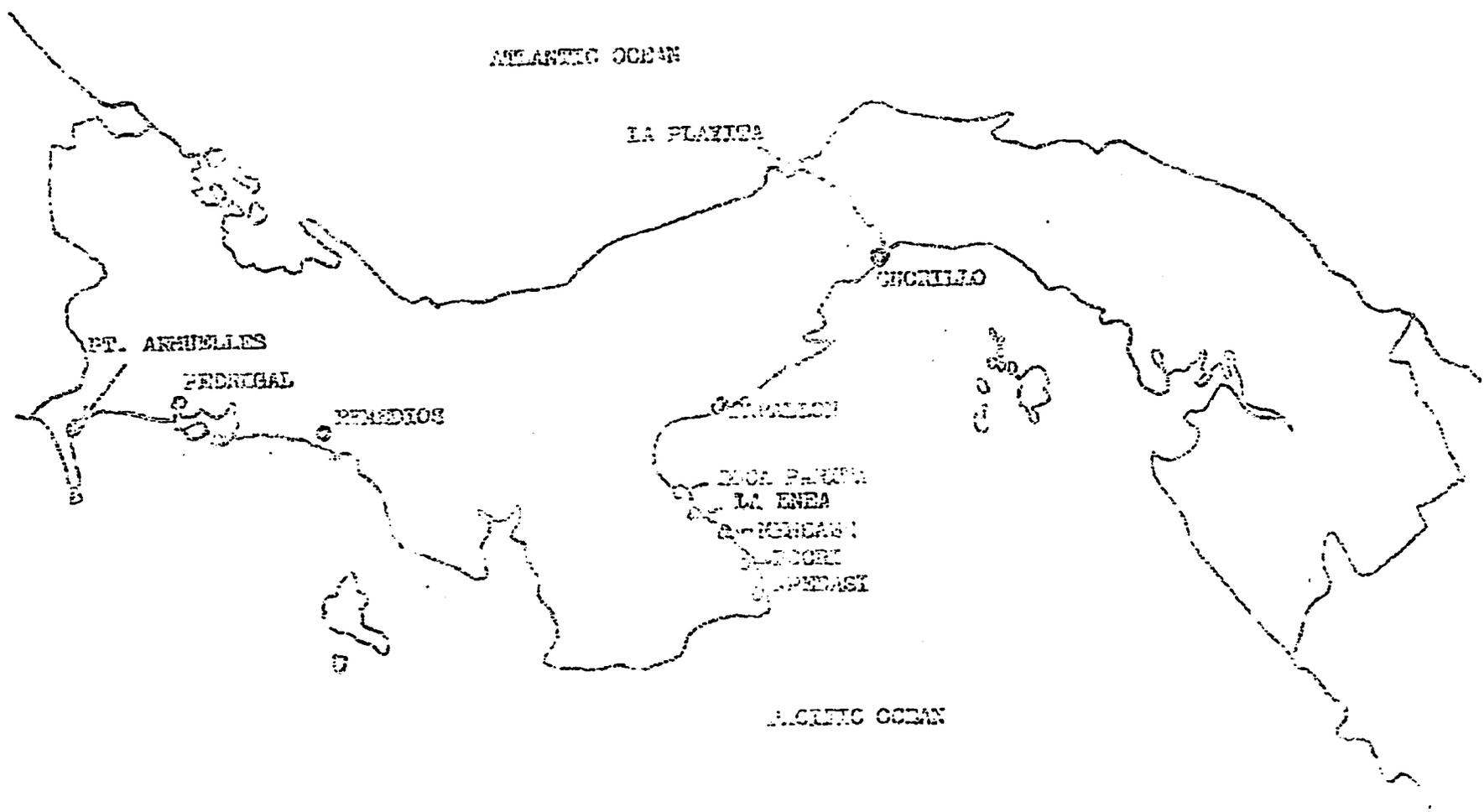


FIGURE 1. LOCATIONS OF FISHING GROUPS DISCUSSED IN PAPER.

TESTS Perception of fishermen's cooperative organizations was determined from a content analysis of the responses to the following three open-ended questions:

- (1) What are the benefits of belonging to a fishermen's cooperative?
- (2) What is a fishermen's cooperative supposed to do?
- (3) What would you do if you were president of a fishermen's cooperative?

Background sociocultural information (e.g. age, formal education, etc.) was determined from responses to direct questions. At La Playita questions were posed in either Spanish or English depending upon the language the respondent was most familiar with. In all other areas the questions were posed in Spanish.

#### ANALYSIS

PERCEIVED BENEFITS OF COOPERATIVE MEMBERSHIP One important facet of an individual's understanding of a cooperative concerns perceptions of benefits of cooperative membership. This variable was investigated by requesting individual fishermen to list the benefits of belonging to a fishermen's cooperative. Responses to this open-ended question were coded and tabulated for all respondents, and the results can be found in table 1.

Table 1. Perceived Benefits of Cooperative Membership

<u>Response Category</u>	<u>Frequency</u>		
	<u>Response 1</u>	<u>Response 2</u>	<u>Response 3</u>
1 Facilitates marketing	22	02	03
2 Social benefits	21	09	01
3 Source of equipment and supplies	17	06	01
4 Facilitates cooperation among members	09	04	01
5 Availability of funds, loans, etc.	07	07	01
6 Facilitates obtaining government help	01	01	02
7 No benefits	05	--	--
8 Other	12	03	01
9 Do not know	<u>59</u>	--	--
Total	153		

As can be seen in table 1 some individuals provide more than one response. Turning to the first response category, which can be considered the most salient since it is the first to come to mind, we find that the most frequent response (39%) is "do not know." Since one of the goals is development of small-scale fisheries through establishment of fishermen's cooperatives, it is important to determine the socio-cultural characteristics of individuals who do not understand the benefits of cooperative membership.

First, we find that it is primarily individuals who do not belong to a cooperative or precooperative who respond that they do not know the benefits

of cooperative membership. Only 12% of cooperative or pre-cooperative members respond "do not know" as contrasted with 63% of the non-members ( $\chi^2 = 40.554$ ,  $\phi = .514$ ,  $p < 0.001$ ). Age also appears to be related to knowledge about benefits of belonging to a cooperative. 45% of the fishermen less than 40 years of age respond that they do not know the benefits of cooperative membership in contrast to only 28% of those 40 years or older ( $\chi^2 = 4.749$ ,  $\phi = .176$ ,  $p < 0.05$ ). Interestingly enough, formal education seems to have little to do with knowledge of benefits of cooperative membership. A slightly greater percentage of those fishermen who have had less than the mean number of years of formal education ( $\bar{X} = 5.1$ ) respond "do not know" than those exceeding the mean (44% versus 34% respectively;  $\chi^2 = 1.454$ ,  $\phi = 0.094$ ,  $p > 0.20$ ). Number of years fishing, however, is strongly related to knowledge of benefits derived from cooperative membership. Fifty-four percent of the fishermen who had been fishing less than the sample mean ( $\bar{X} = 16.8$  years) number of years respond "do not know" in contrast to only sixteen percent of those exceeding the mean ( $\chi^2 = 22.271$ ,  $\phi = 0.389$ ,  $p < 0.001$ ).

Turning to other perceived benefits of belonging to a cooperative, we find that marketing, social benefits, and provision of equipment and supplies are referred to with the greatest frequency. The marketing category includes responses which refer to marketing facilities or obtaining better prices for fish. The social benefits category is composed of responses which reflect a perceived social benefit (e.g. help when sick, better future for self and children, etc.). The other categories are self explanatory.

Table 2 presents frequencies of response categories for cooperative/pre-cooperative members and non-members. Responses cross-tabulated in Table 2 are the first, most salient responses.

Table 2. Perceived Benefits of Cooperative Membership Cross-Tabulated with Cooperative/Precooperative Membership

<u>Response Category</u>	<u>Cooperative/Precooperative</u>	
	<u>Member</u>	<u>Non-member</u>
Facilitates Marketing	19	03
Social Benefits	13	08
Source of Equipment and Supplies	08	09
Facilitates Cooperation among Members	04	05
Availability of Funds, Loans, etc.	07	--
Facilitates Obtaining Government Help	--	01
No Benefits	05	--
Other	08	04
Do Not Know	09	50
	—	—
Total	73	80

It is interesting to note, that of the high frequency categories, marketing is mentioned more frequently as a benefit by cooperative/precooperative members than by non-members ( $\chi^2 = 15.386$ ,  $\phi = .316$ ,  $p < 0.001$ ). This suggests that non-members are not aware of this as one of the important functions that can be performed by a fishermen's cooperative. The difference in response frequencies for the social benefit and equipment/supplies categories are not statistically significant. Other response categories are of a relatively low frequency and need not be discussed in terms of statistical significance. The "do not know" category is discussed above. It is interesting

to note, however, that only cooperative/precooperative members say that membership in a cooperative provides no benefits.

Response categories cross tabulated with age dichotomized at 40 years can be found in table 3. As can be seen in table 3,

Table 3. Perceived Benefits of Cooperative Membership Cross-Tabulated with Age.

<u>Response Category</u>	AGE	AGE
	<u>Less Than 40</u>	<u>40 or Older</u>
Facilitates Marketing	11	11
Social Benefits	07	14
Source of Equipment and Supplies	13	04
Facilitates Cooperation among Members	06	03
Availability of Funds, Loans, etc.	05	02
Facilitates Obtaining Government Help	--	01
No Benefits	02	03
Other	08	04
Do Not Know	43	16
	—	—
Total	95	58

---

age is significantly related to only one of the high frequency response categories other than "do not know": perceived social benefits ( $\chi^2 = 8.552$ ,  $\phi = 0.234$ ,  $p < 0.01$ ). It appears that older fishermen are more aware of the social benefits of cooperative membership than younger fishermen. Age has

no significant effect on response frequencies for the equipment and supplies and marketing categories (Chi Square equals 1.679 and 1.596 respectively indicating that the probability that the response distributions could have occurred by chance exceeds 0.10).

Table 4 includes response categories cross-tabulated with formal education dichotomized at 6 years. None of the three highest frequency response categories (marketing, social benefits, equipment/supplies) manifest statistically different response patterns with respect to formal education of respondent. We thus conclude that formal education has little to do with perception of benefits derived from participation in fishermen's cooperatives.

Table 4. Perceived Benefits of Cooperative Membership Cross-Tabulated with Education

<u>Response Category</u>	<u>Formal Education*</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Less than 6</u>	<u>6 or More</u>		
Facilitates Marketing	08	14	1.041	>0.30
Social Benefits	09	12	0.123	>0.70
Source of Equipment and Supplies	09	08	0.328	>0.50
Facilitates Cooperation among Members	02	07		
Availability of Funds, Loans, etc.	04	03		
Facilitates Obtaining Government Help	--	01		
No Benefits	03	02		
Other	05	07		
Do Not Know	31	28		
	<hr/>	<hr/>		
Total	71	82		

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\*Dichotomized at sample mean ( $\bar{X} = 5.1$ )

Finally, turning to number of years fishing, we find that none of the three highest frequency response categories seem to be related to this variable (see table 5). The "do not know" response, which is inversely related to number of years fishing, is discussed above.

Table 5. Perceived Benefits of Cooperative Membership Cross-Tabulated with Number of Years Fishing

<u>Response Category</u>	<u>Years Fishing*</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Less than 17</u>	<u>17 or More</u>		
Facilitates Marketing	10	12	1.896	>.10
Social Benefits	09	12	2.561	>.10
Source of Equipment and Supplies	08	09	1.092	>.20
Facilitates Cooperation Among Members	03	06		
Availability of Funds, Loans, etc.	02	05		
Facilitates Obtaining Government Help	01	--		
No Benefits	02	03		
Other	06	06		
Do Not Know	49	10		
	—	—		
Total	90	63		

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\*Dichotomized at sample mean ( $\bar{X} = 16.8$ ).

CONCEPTUALIZATION OF A COOPERATIVE'S FUNCTION Turning to another facet of an individual's conceptualization of a fishermen's cooperative, we next examine conceptualized function. This differs somewhat from perceived benefits

in that it is concerned with what the fisherman thinks a cooperative is supposed to accomplish. It will, of course, overlap with perceived benefits, but the differences will provide us with a more complete picture of the fisherman's conceptualization of a cooperative organization.

The fishermen's conceptualization of the function of a cooperative was investigated by asking individual fishermen the open-ended question "what is a fishermen's cooperative supposed to do?" Frequencies of the categorized responses to this question can be found in table 6.

Table 6. Fishermen's Conceptualization of the Function of a Cooperative

<u>Response Category</u>	<u>Frequency</u>		
	<u>Response 1</u>	<u>Response 2</u>	<u>Response 3</u>
Provide Equipment and Supplies	34	16	05
Help in All Areas	32	03	--
Facilitate Cooperation	14	05	01
Provide Administration	09	02	--
Aid in Marketing	08	09	01
Provide Source for Funds	08	06	01
Educate Members	02	04	01
Other	14	07	03
Do Not Know	32	--	--
<b>Total</b>	<b>153</b>		

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Table 6 indicates that the most frequent response to this question involves reference to provision of equipment and/or supplies. 55 fishermen made reference to this function in their answers. The next most frequent

response category is very general. Fishermen simply note that a cooperative is supposed to help them in all areas. "Do not know" is once again a high frequency category, but not as high as for the question concerning benefits of a cooperative. Another high frequency response refers to the idea that a cooperative is supposed to facilitate cooperation. The other response categories manifest relatively low frequencies, but it is interesting to note that functions such as providing administration and education of members are not mentioned among the fishermen's perceptions of the benefits of a cooperative. This question has thus broadened our understanding of the fishermen's conceptualization of a cooperative.

The primary response categories were cross-tabulated with cooperative/precooperative membership, age, number of years fishing, and formal education. Chi Square was calculated for high frequency response categories.<sup>1</sup> The results of this analysis can be found in tables 7 through 10.

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<sup>1</sup>Here high frequency response category refers to a category which was mentioned by at least 10% of the sample as either a 1st, 2nd, or 3rd response. Primary response refers to the first, most salient response.

**Table 7. Conceptualization of Cooperative Function Cross-Tabulated with Age**

<u>Response Category</u>	<u>Age</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Less than 40</u>	<u>40 or More</u>		
Provide Equipment & Supplies	21	13	0.001	> 0.90
Help in all Areas	17	15	1.382	> 0.20
Facilitate Cooperation	06	08	2.422	> 0.10
Provide Administration	08	01		
Aid in Marketing	07	01		
Provide Source for Funds	04	04		
Educate Members	02	--		
Other	09	05		
Do Not Know	21	11	0.214	> 0.50
<b>Total</b>	<u>95</u>	<u>58</u>		

**Table 8. Conceptualization of Cooperative Function Cross-Tabulated with Years Fishing**

<u>Response Category</u>	<u>Years Fishing*</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Less than 17</u>	<u>17 or More</u>		
Provide Equipment & Supplies	19	15	0.156	> 0.50
Help in all Areas	15	17	2.384	> 0.10
Facilitate Cooperation	05	09	3.397	< 0.10
Provide Administration	05	04		
Aid in Marketing	06	02		
Provide Source for Funds	04	04		
Educate Members	02	--		
Other	07	07		
Do Not Know	27	05	10.906	< 0.001
<b>Total</b>	<u>90</u>	<u>63</u>		

\*Dichotomized at sample mean ( $\bar{X} = 16.8$ ).

Table 9. Conceptualization of Cooperative Function Cross-Tabulated with Cooperative/Precooperative Membership.

<u>Response Category</u>	<u>Cooperative/Precooperative</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Member</u>	<u>Non-member</u>		
Provide Equipment & Supplies	13	21	1.573	> 0.10
Help in all Areas	21	11	5.204	< 0.05
Facilitate Cooperation	11	03	5.882	< 0.02
Provide Administration	03	06		
Aid in Marketing	05	03		
Provide Source for Funds	05	03		
Educate Members	02	--		
Other	09	05		
Do Not Know	04	28	20.110	< 0.001
<b>Total</b>	<b>73</b>	<b>80</b>		

Table 10. Conceptualization of Cooperative Function Cross-Tabulated with Formal Education

<u>Response Category</u>	<u>Formal Education*</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Less than 6</u>	<u>6 or More</u>		
Provide Equipment & Supplies	17	17	0.227	> 0.50
Help in all Areas	11	21	2.354	> 0.10
Facilitate Cooperation	09	05	1.980	> 0.10
Provide Administration	05	04		
Aid in Marketing	03	05		
Provide Source for Funds	02	06		
Educate Members	01	01		
Other	06	08		
Do Not Know	17	15	0.734	> 0.30
<b>Total</b>	<b>71</b>	<b>82</b>		

\*Dichotomized at sample mean ( $\bar{X} = 5.1$ ).

As can be seen in Tables 7 and 10, neither age nor formal education are significantly related to conceptualization of cooperative function. Years fishing and cooperative/precooperative membership are, however, related to some response categories. Tables 8 and 9 indicate that individuals who do not know the function of a cooperative are more likely to have fished for less than 17 years (sample mean equals 16.8 years) and not be a member of a cooperative or precooperative. There is also a statistically significant tendency for cooperative/precooperative members and individuals who have fished for more than 17 years to respond that the function of a cooperative is to facilitate cooperation among members. Finally, members are more likely than non-members to provide the general response that the function of a cooperative is to help in all areas.

PROJECTED ACTIONS OF INDIVIDUAL FISHERMEN HYPOTHETICALLY PLACED IN CHARGE OF A FISHERMEN'S COOPERATIVE The previous two sections examined individual fishermen's knowledge concerning benefits and functions of a cooperative organization. In this section we turn to an analysis of what the individual fisherman would do if he were in charge of a cooperative. Here the fisherman is requested to imagine himself in a position wherein he could control the operation of a cooperative. The information derived from this analysis thus provides an insight into both the functions and the benefits that individual fishermen would like to see associated with a cooperative. This contrasts with the previous two sections which were primarily concerned with an individual's information concerning cooperative organizations. Here the fisherman can go beyond received knowledge and suggest techniques for making the organization more useful in his specific environment. This information is derived from a question which requested the fishermen to tell us what he

would do if he were president of a fishermen's cooperative. Responses to this question were categorized, and the response categories can be found in table 11.

Table 11. Projected Action of Individual Fishermen Hypothetically Placed in Charge of a Fishermen's Cooperative.

<u>Response Category</u>	<u>Frequency</u>		
	<u>Response 1</u>	<u>Response 2</u>	<u>Response 3</u>
Provide Equipment	39	19	06
Provide Adequate Administration	21	03	01
Obtain Funds	17	07	02
Improve Marketing & Processing	16	08	04
Foment Cooperation among Members	08	04	02
Provide Equipment Maintenance	03	03	--
Educate Members	02	--	01
Other	23	08	03
Do Not Know	24	--	--
<u>Total</u>	<u>153</u>		

Table 11 clearly indicates that many of the fishermen interviewed would like to see the cooperative provide more and better equipment. Provision of adequate administration was mentioned by a fair amount of fishermen suggesting that they view proper administration as an important facet of operating a cooperative. Obtaining funds and improvement of marketing and processing are next highest in frequency and reflect an ongoing concern of small-scale fishermen. Once again, the "do not know" category is relatively large.

Primary response categories are again cross-tabulated with cooperative/precooperative membership, age, number of years fishing, and formal education. High frequency response categories are examined for differential distributions across these variables using the Chi Square test of statistical significance. The results of this analysis can be found tables 12 through 15.

Table 12. Projected Action of Individual Fishermen Hypothetically Placed in Charge of a Fishermen's Cooperative Cross-Tabulated with Age.

<u>Response Category</u>	<u>Age</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Less than 40</u>	<u>40 or More</u>		
Provide Equipment	21	18	1.511	>0.20
Provide Adequate Administration	16	05	2.055	>0.10
Obtain Funds	08	09	1.836	>0.10
Improve Marketing and Processing	09	07	0.259	>0.50
Foment Cooperation among Members	05	03		
Provide Equipment Maintenance	03	--		
Educate Members	02	--		
Other	13	10		
Do Not Know	18	06	2.015	>0.10
Total	95	58		

Table 13. Projected Action of Individual Fishermen Hypothetically Placed in Charge of a Fishermen's Cooperative Cross-Tabulated with Number of Years Fishing.

<u>Response Category</u>	<u>Years Fishing*</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Less than 17</u>	<u>17 or More</u>		
Provide Equipment	21	18	0.535	>0.30
Provide Adequate Information	15	06	1.596	>0.20
Obtain Funds	08	09	1.092	>0.20
Improve Marketing & Processing	09	07	0.048	>0.80
Foment Cooperation among Members	04	04		
Provide Equipment Maintenance	02	01		
Educate Members	01	01		
Other	12	11		
Do Not Know	18	06	3.075	<0.10
<b>Total</b>	<b>90</b>	<b>63</b>		

\*Dichotomized at Sample Mean ( $\bar{X} = 16.8$ ).

Table 14. Projected Action of Individual Fishermen Hypothetically Placed in Charge of a Fishermen's Cooperative Cross-Tabulated with Cooperative/Precooperative Membership.

<u>Response Category</u>	<u>Cooperative/Precooperative</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Member</u>	<u>Non-member</u>		
Provide Equipment	16	23	0.938	>0.30
Provide Adequate Administration	04	17	8.016	<0.01
Obtain Funds	13	04	6.340	<0.02
Improve Marketing & Processing	12	04	5.333	<0.05
Foment Cooperation among Members	03	05		
Provide Equipment Maintenance	01	02		
Educate Members	01	01		
Other	16	07		
Do Not Know	07	17	3.924	<0.05
<b>Total</b>	<b>73</b>	<b>80</b>		

**Table 15. Projected Action of Individual Fishermen Hypothetically Placed in Charge of a Fishermen's Cooperative Cross-Tabulated with Formal Education.**

<u>Response Category</u>	<u>Formal Education*</u>		<u><math>\chi^2</math></u>	<u>p</u>
	<u>Less than 6</u>	<u>6 or More</u>		
Provide Equipment	21	18	1.165	>0.20
Provide Adequate Administration	13	08	2.351	>0.10
Obtain Funds	08	09	0.003	>0.95
Improve Marketing & Processing	05	11	1.650	>0.10
Foment Cooperation among Members	03	05		
Provide Equipment Maintenance	01	02		
Educate Members	01	01		
Other	09	14		
Do Not Know	10	14	0.256	>0.50
Total	71	82		

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\*Dichotomized at Sample Mean ( $\bar{X} = 5.1$ ).

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Once again, as can be seen in tables 12 and 16, neither age nor formal education are significantly related to projected action of fishermen hypothetically placed in charge of a fishermen's cooperative. Further, years of fishing is only weakly related to the "do not know" response category. It appears, however, that membership in a cooperative or pre-cooperative significantly affects answers to this question. Table 14 indicates that cooperative/pre-cooperative members are less likely to refer to adequate administration in their first response. Additionally, cooperative/pre-cooperative members are more likely to note that if they were president of a fishermen's cooperative they would obtain funds and improve marketing and processing.

Finally, cooperative/precooperative members are less likely to respond that they do not know what they would do if they were president of a fishermen's cooperative.

SOCIOCULTURAL CORRELATES OF LACK OF KNOWLEDGE ABOUT FISHERMEN'S COOPERATIVE

ORGANIZATIONS

In this final section of the analysis we examine the interrelationships between professed lack of knowledge about fishermen's cooperative organizations and other sociocultural variables. Lack of knowledge is determined from responses to the three questions discussed above. Individuals are assigned scores of one for each of the questions to which they respond "do not know." These scores are summed resulting in a dependent variable ranging from zero to three, with three denoting the highest degree of lack of knowledge about fishermen's cooperatives. The independent variables were measured by responses to direct questions. These variables include the following: (1) age, (2) number of years fishing, (3) cooperative/precooperative member, (4) number of years in cooperative/precooperative, (5) past but not present cooperative/precooperative membership, (6) formal education, (7) number of times per week watch television, (8) number of times per week listen to radio, (9) number of times per week read newspaper. The interrelationships between the independent and dependent variables can be found in table 16.

Table 16. Interrelationships between Lack of Knowledge Concerning Fishermen's Cooperative Organizations and other Sociocultural Variables.

	1	2	3	4	5	6	7	8	9	10
1. Age (years)	1.00	0.67	0.32	0.40	-0.10	-0.26	0.14	-0.07	0.13	-0.25
2. Number of years fishing		1.00	0.25	0.43	0.06	-0.18	0.03	0.05	0.15	-0.36
3. Cooperative/Precooperative member			1.00	0.71	-0.44	0.05	0.15	-0.11	0.15	-0.48
4. Years in Cooperative/Precooperative				1.00	-0.31	0.02	0.16	-0.09	0.25	-0.42
5. Past but not Present Cooperative Member					1.00	0.08	-0.12	0.10	-0.01	-0.01
6. Formal Education						1.00	-0.17	-0.01	0.42	-0.15
7. Times per week watch Television							1.00	-0.15	0.16	-0.16
8. Times per week listen to radio								1.00	-0.04	0.07
9. Times per week read newspaper									1.00	-0.35
10. Lack of knowledge about Fishermen's Cooperative Organizations (scale)										1.00

N = 153. if  $r \geq |0.16|$   $p < 0.05$ ; if  $r \geq |0.21|$   $p < 0.01$

Table 16 indicates that six of the nine independent variables are significantly related to the dependent variable--five of them at better than the 0.01 level. The two variables with the highest correlations concern cooperative/precooperative membership. As would be expected there is an inverse relationship between cooperative/precooperative membership and lack of knowledge about a fishermen's cooperative. It follows that amount of time spent as a cooperative member would also be negatively related to lack of knowledge about cooperative organizations, and table 16 indicates that this is so.

It appears that age and number of years fishing are also inversely related to the dependent variable. This suggests that those who have lived or fished longer have had a greater chance to obtain information concerning cooperatives. Finally, two of the mass media exposure variables are inversely related to lack of knowledge about fishermen's cooperatives: Television watching and newspaper reading. The correlation with the television variable is relatively weak, but statistically significant. The correlation between the dependent variable and newspaper reading, however, is quite respectable. Apparently, individuals who watch television frequently, and to a greater extent, those who frequently read newspapers, are less likely to lack knowledge concerning fishermen's cooperative organizations. There are two possible interpretations of this findings, either some information concerning cooperatives is derived from television and newspapers or individuals who are inquisitive enough to read newspapers and watch television are more likely to also search out information on cooperatives. This finding does, however, converge with other research which indicates that mass media exposure is strongly related to innovative behaviour (Rogers 1969; Rogers &

Shoemaker 1971).

Finally, a step-wise multiple regression analysis was conducted to determine the interrelationships between the dependent variable and all the independent variables. In the analysis presented here, the first variable entered is the one which explains the most variance in the dependent variable; the next entered is the one which explains the most with the first controlled. This step-wise procedure is continued until the increase in amount of variance explained decreases to less than a previously set level. In this analysis we cease entering variables when the increase in amount of variance explained falls to less than one percent. The results of this analysis can be found in table 17.

Table 17. Results of Step-wise Multiple Regression of Sociocultural Variables with Lack of Knowledge Concerning Fishermen's Cooperative Organizations.

<u>Step Number</u>	<u>Variable Entered</u>	<u>Multiple R</u>	<u>R<sup>2</sup></u>	<u>F Ratio</u>	<u>D.F.</u>	<u>p</u>
1	Cooperative member	0.476	0.227	44.246	1 151	<0.001
2	Newspaper reading	0.553	0.306	32.991	2 150	<0.001
3	Past cooperative member	0.596	0.355	27.328	3 149	<0.001
4	Years fishing	0.623	0.388	23.456	4 148	<0.001

Table 17 indicates that after cooperative/precooperative membership is controlled, frequency of newspaper reading explains the greatest amount of variance with respect to lack of knowledge about fishermen's cooperatives. Cooperative/precooperative membership and frequency of newspaper reading together account for 31% of the variance in the dependent variable. Past

cooperative membership adds 5% to the amount of variance explained and number of years fishing adds approximately 3% more. With these four variables controlled for, the remaining 5 independent variables account for an insignificant proportion of the variance in the dependent variable. The first four variables entered, however, account for 39% of the variance, which is a respectable amount and statistically significant at better than the 0.001 level. On the basis of this analysis we can confidently state that if a fisherman is or has been a cooperative/precooperative member, frequently reads newspapers, and has been fishing for quite a while he will be likely to have more knowledge concerning fishermen's cooperative organizations than people lacking these attributes.

#### CONCLUSIONS

We have seen a great deal of overlap in response patterns to the three questions concerning various aspects of a fisherman's knowledge of cooperative organizations. The response category appearing most frequently dealt with provision or availability of equipment. This category appears in 143 responses, a frequency more than double any other category. It thus seems that fishermen view the cooperative primarily as a means of obtaining equipment. The fact that none of the independent sociocultural variables (age, education, cooperative/precooperative membership, years fishing) are significantly related to the distribution of this response category indicates that it is a widely shared attribute, forming part of the conceptualization of fishermen's cooperatives among the fishermen in our sample.

Overall the next most frequent response dealt with marketing attributes of fishermen's cooperatives. There were a total of 71 responses which reflect

this attribute. The analyses presented above show that cooperative/precooperative members are more likely to see this as an important attribute of cooperative organizations than non-members. Since marketing problems are often the greatest impediment to small-scale fisheries development, it appears that this positive attribute of fishermen's cooperatives should be stressed when trying to establish new organizations. An attempt should be made to educate the fishermen concerning the importance of the marketing function of fishermen's cooperatives.

The cooperative is also frequently perceived as being a source of funds. The total responses reflecting this attribute numbered 56. The fisherman views the cooperative as a mechanism for obtaining funds from government sources as well as a means of accumulating a pool of funds gained from dues, percentage on fish sold, and social activities. The distribution of this response category, however, indicates that cooperative/precooperative members mention this attribute significantly more than nonmembers. Once again, this indicates a lack of knowledge concerning cooperative organizations on the part of non-members which should be rectified in the cooperative movement is to proceed.

Forty-eight responses reflect the attribute of cooperation among members. Once again the only sociocultural variable significantly related to this attribute was cooperative/precooperative membership. There was, however, a relatively weak tendency for older fishermen to make reference to this category also.

Finally, the next most frequent high frequency response category referred to provision of adequate administration. This time, however, it was non-cooperative/precooperative members who mentioned this category most

frequently. This unexpected relationship suggests that something other than cooperative/precooperative membership is affecting the response pattern. It was therefore decided to examine response patterns of individuals who belonged to a cooperative in the past, and who had left for some reason. A total of 27 non-cooperative/precooperative members had previously belonged to a cooperative. Of these 26 percent responded that they would improve administration if they were president of a cooperative. This contrasts with only 11 percent of the others--a difference which is statistically significant ( $\chi^2 = 4.121$ ,  $\phi = 0.16$ ,  $p < 0.05$ ). It is thus past members of cooperatives who tend to respond that proper administration is an important attribute.

An other important aspect of our findings concerns the sociocultural correlates of lack of knowledge about fishermen's cooperatives. It was demonstrated above that age, number of years fishing, cooperative/precooperative membership, years in cooperative/precooperative, television viewing, and newspaper reading are all significantly related to knowledge about cooperative organizations. A multiple regression analysis indicated that the most important correlates are cooperative/precooperative membership and newspaper reading. Exposure to mass media has often been cited as an important factor associated with change (Rogers & Shoemaker 1971), and this analysis supports these findings. The fact that formal education is not significantly related to any aspect of our findings is extremely interesting and will be examined in a future paper.

Overall our findings have indicated that although there is some agreement concerning the meaning of a fishermen's cooperative, there is also variability in knowledge concerning this type of organization and its benefits and functions. Such variability in beliefs can lead to problems

in instituting and maintaining the organizations because of varying expectations on the part of participants. It is suggested that effective techniques be developed to communicate the total meaning of this form of organization to the individual fishermen in areas where fishermen's cooperatives are either planned or in operation.

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