CEER-X-140

EVALUATION SURVEY OF CULEBRA PROJECT

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Febrero 1982

*Support for this project was obtained from NSF Grant OSS-8015824

1. Introduction

Over a seven month period, the Center for Energy and Environment Research and the Culebra Energy Committee sponsored five workshops as part of the Culebra Project funded by the National Science Foundation. The purpose of these activities was to provide community residents, scientists, and policy makers with the opportunity of exchanging information about the energy crisis and alternate energy strategies.

During November 1981, the evaluation phase of the Project was carried out. The objectives of the evaluation were to document the impact of the workshops on residents of Culebra and to provide basic data to aid the Culebra Energy Committee in planning efforts to implement community based alternate energy projects. The following report contains the results of the evaluation performed.

II. METHODOLOGY

The evaluation process consists of the following tasks: selection of the sample to be interviewed, design and testing of the evaluation instrument recruitment and training of interviewers, and implementation of the interview schedule.

The sample of residents to be interviewed was drawn from the 1980 Electoral Lists for the Municipality of Culebra. The Electoral Lists were selected because they provided the most recent and accessible data, listing of household units including names, age, and sex of the voter. From these lists, 150 names were randomly selected with represent approximately 13% of Culebra's total population. With the information on residence and kinship patterns, it was possible to screen each potential participant assuring that only one person per household was selected. The final sample represents 150 persons residing in 150 different households which constitute 50% of the total number of residential units on Culebra.

The evaluation questionnaire was designed to elicit data in the following areas:

1. Socio-demographic characteristics of the interviewees;
2. Information about and participation in the Project's workshops;
3. Attitudes towards and perception of the energy problems of Culebra;
4. Knowledge and use of energy conservation measures;
5. Descriptive features of the interviewees household pertinent to energy consumption.

The Project's staff met on two occasions to revise the questionnaire which was then submitted to the Culebra Energy Committee for

their comments and suggestions. The instrument was further revised and pre-tested during the training session of the interviewers.

The interviewers were recruited by means of an advertisement distributed at the following locations: the High School, the Multi-Service Community Center, the Mayor's office, and local business. Although the advertisement specified that applicants should have previous interviewing experience, only eight out of eleven had this experience. On November 2, 1981, the eleven interviewers met for a training session which included the following objectives: a review of the questionnaire to acquaint the interviewers with the content of and type of responses solicited; and a series of mock-interviews to prepare the interviewers for dealing with a variety of anticipated situations and responses.

The interview schedule consisted of two days (Nov. 14-15, 1981). Each interviewee was assigned 14-15 questionnaires and was provided with a list of names and addresses from the sample selected. On-site supervision was provided throughout the interview process. Those that could not be completed in the two-day schedule (15 in total) were administered during the following week. The response rate of the survey was 100% participation.

III. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The sample surveyed is of 150 persons distributed between 84 men (56% of the sample) and 66 women (44%). The range in ages of the sample is from 19 to 71 years of age. The age breakdown is as follows:

19-29 years -- 30 persons, for 20% of the sample;

30-39 years -- 55 persons for 37% of the sample;

40-49 years -- 24 persons for 16% of the sample;

50-59 years -- 31 persons for 21% of the sample;

60 and over -- 10 persons for 6% of the sample.

The sample includes persons with a wide range of educations experience ranging between 4% of the sample having no formal education; 45% having from 1 to 8 years of schooling; 35% of the sample reported from 9 to 12 years of schooling; and 16% of the sample university education.

In terms of the family structure of the sample households, the avarage number of persons per household is four with a range from one person to both spouses and two children between the ages of one to ten years of age.

The economic characteristics of the sample reveals a total of 119 employed persons (80%); 26 unemployed persons (17%); and 5 retired persons (3%). The relatively high rate of reported unemployment may be explained by the fact that housewives (10 persons) identified themselves as unemployed. The employed sector of the sample works principally at the Travenol plant (60 persons); for the municipal government (17 persons); and for the state and federal governments (18 persons).

Reported income varies from $120 to $2,000 per month with the average family income at approximately $500 per month. As reported by the interviewees, 38 of the 150 persons (25%) receive some form of government aid to supplement their income. The main types of government aid received are food stamps and social security benefits.

In summary, the sample is predominately young (less than 39 years of age) married, and in their most productive and reproductive period.

IV. DESCRIPTION OF RESIDENCE UNIT

The information on the residential units includes the type of construction, size, possession of energy consuming and producing devices, and cost of energy consumption.

The majority of the sample, 64 persons (42%) reside in concrete structures, 42 persons (28%) live in wooden structures, and 41 persons (27%) live in combined wooden and concrete structures. Three persons in the sample live in trailers. The majority of the houses (54%) have either zinc or metal roofs; 41% of the houses have cement roofs; and 5% of the houses have wooden roofs. The size of the houses range from one to six rooms with the average dwelling having three rooms.

With the exception of one person, none of the residential units reported owning energy producing devices. Concerning energy consuming devices, the interviewees reported the following:

1)	electric refrigerator	145	persons (97%)
2)	television	141	persons (94%)
3)	gas stove	139	" (97%)
4)	radio	139	" (93%)
5)	iron	135	" (90%)
6)	fans (average of one fan per household)	122	" (81%)
7)	washing machine	118	" (79%)
8)	record player	94	" (63%)
9)	toaster	69	" (46%)
10)	water heater	29	" (19%)
11)	air conditioners	16	" (11%)
12)	electric stove	4	" (3%)
13)	clothes dryer	3	" (2%)

The appliances most often found in the sample's homes are electric refrigerators, gas stove, irons, televisions, radios, washing machines, and fans.

Car ownership in the sample is high with 92 persons (61%) owning cars. The average number of cars is one per household.

The average monthly cost for electricity was estimated to be $12; the cost of gasoline was calculated at $50 per month; and $43 per month* for protane gas. Of the sample, 83 persons (55%) reported that they were receiving the government subsidy for light, and 17 persons (11%) did not know if they did or did not receive said subsidy. The interviewees perceived the subsidy-granting institutions as follows:

67 persons (45%) did not know who was the granting institution;
39 persons (25%) informed that the Puerto Rican government was responsible;
27 persons (18%) informed that the federal government granted the subsidies;
12 persons (18%) informed that it was the Electric Power Authority;
5 persons (3%) informed that it was the Municipality of Culebra.

V. WORKSHOP PARTICIPATION

The first task in the evaluation of the Project's impact is the determination of the effectiveness of the publicity used. Three strategies were devised to disseminate information about the Project and workshops: letters sent to box-holder at the Culebra Post Office, radio program and spots, and direct contact with residents in the community.

*This figure is suspect as an estimated of monthly costs since a tank of gas costs about $43 and for most persons a tank should last from two to three months.

that 109 of the 150 persons interviewed (73%) reported that they knew of the alternate-energy workshops being celebrated in Culebra. Those persons who were informed of the workshops indicated that their information sources were as follows: 65 persons received a letter; 27 persons heard the announcement on the radio, and 27 persons were personally contacted.

As regards attendance at the workshops, it was found that 17 persons attended an average of two workshops. The workshops attracted 16% of the informed sector of the sample. This proportion represent, however, only 11% of the total sample.

Among the informed portion of the sample, 56 persons (51%) knew of other persons who had attended the workshops, while only 39% had reported having received comments about the workshops from those that attended. The comments reported were overwhelmingly positive with only one negative response. The comments were directed towards the purpose and content of the workships. Of the informed sector, 27% reported having personally urged other persons to attend the workshops and approximately the same percentage (30%) spoke to other persons about the workshops. The comments made to other persons dealt essentially with information about the content of the workshops, the need for increased participation and the benefits to the community from such projects. All of the comments were positive with the exception of one person who perceived little hope for Puerto Rico's energy situation.

Concerning the 17 persons that attended one or more workshops, the questionnaire revealed that the first workshop stimulated 15 of them to attend another workshop, and that these same 15 persons perceived having obtained new or additional information about the energy

crisis and alternate energy sources. The newly acquired information was in the areas of:

1. the energy crisis in general;
2. specific alternate energy sources and deivices, such as windmills, solar heaters, and solar desalinization process;
3. conservation measures to reduce energy consumption and costs.

When asked if this new information had in some way been used, only one person answered that he had visited a plant that manufactures windmills and had solicited a wind-measuring device.

Those that attended the workshops reported that the most important topics discussed were: solar energy, windmills, cost and energy conservation. This same group expressed the concern that certain topics, seen by them as important were not adequately dealt with in the workshops. These topics were the cost and financing of alternate energy devices and alternate energy sources most appropriate for Culebra. It should be noted that four of the 17 persons that attended the workshops understood that the sessions had included all of these topics and that all were important and relevant.

Those persons that did not attend any of the workshops gave the following reasons for not attending

1. work related situations, including conflicts between the workshop calendar and employment, and fatigue after work,
2. other commitments such as religious meetings, child care and undefined previous engagements;
3. lack of interest;
4. illness; and
5. lack of information including not having received a letter of invitation or having received the information after the date of the activity.

Nonetheless, 132 persons (88%) of the total sample, expressed interest in attending the Project's next meeting with only 18 persons (12%) expressing a lack of interest in attending.

VI. ENERGY AND CULEBRA

This section analyzes the interviewees perception of the energy situation in Culebra; attitudes toward community-based action programs and future experimental projects; and knowledge about alternate energy sources.

The general opinion of the sample is that Culebra has an energy problems*. The three most important energy problems reported by island residents are: electricity was mentioned 69 times, gasoline received 55 mentions, and protane gas was mentioned 55 times. While not among the top three energy problems, it should be mentioned that water rated fourth being mentioned 32 times.

As regards electricity, it was found that 142 residents (95%) have electricity in their homes, while 8 persons do not. When asked to rate the cost of electricity, 56 persons (37%) perceive the price as very high; 29 persons feel that the price is high (19%); 55 persons (36%) rate the price as moderate; 5 persons (3%) indicate that the service is low priced. For the remaining 6 persons of the samples, the question did not apply since they do not have electricity in their homes.

When asked to list the problems electricity poses for them, 80 persons (53%) responded that electricity service causes them no real inconveniences or problems; 46 persons (31%) reported few problems caused by the electricity service; 13 persons (9%) reported exper-

*Specifically, 116 persons (77%) believe this to be the case while 23 persons (23%) did not agree.

iencing many problems, and 11 persons did not express an opinion (7%).

The problems faced by electricity users were stated as follows:

1. problems of outages was mentioned 30 times;
2. damage to electrical appliances and food spoilage as a consequence of outages was mentioned 32 times;
3. fluctuating voltage was mentioned 10 times;
4. the cost was mentioned 6 times.

On the basis of cost of and problems with electicity, 59 persons (39%) evaluate electricity as a relatively minor problem; and 38 persons (25%) do not consider electricity a problem. Of the sample 28 persons (19%) consider electricity in Culebra as a serious problem with an additional 14 persons (10% rating it as a very serious problem. Eleven persons (7%) did not respond.

A similar evaluation was requested concerning gasoline and protane gas services. Gasoline is bought by 107 persons (71%). In terms of cost, 70 persons (47% of the total sample) feel that the price of gasoline is very high; 38 persons (15% evaluate the price as high; and 21 persons (14%) found the price to be moderate. The remaining persons either had no opinion or did not know what the price of gasoline was low.

The obtaining or buying gasoline was not considered to be a problem for 57 persons (38%); 45 persons (30%) reported having experienced few inconveniences. For 15 persons (10%) buying gasoline poses serious difficulties, while 33 persons (22%) had no opinion on the subject.

The specific problems mentioned by the interviewees in obtaining gasoline are:

1. limited quantities and inferior quality of product (mentioned 33 times);
2. inefficient service and limited hours to buy (mentioned 27 times),
3. high cost (mentioned 3 times).

Based on the cost of and problems in buying gasoline, 25 persons (17%) rate gasoline as a very serious problem, 34 persons (23%) feel that gasoline is a serious problem; 46 persons (31%) receive it as a minor problem; and 32 persons do not perceive it as a problem (21%). Thirteen persons interviewed expressed no opinion (9%).

As regards the consumption of protane gas, 124 persons (83%) buy protane gas. The cost of this product is thought to be extremely high by 118 persons (78%); 19 persons (12%) evaluate the price as high. Only 4 (3%) persons consider the price to be moderate and 11 persons (79%) have no opinion. In like manner, 78 persons (52%) experience a great many problems in obtaining this product, while 33 persons (22%) have few problems; 28 persons (19%) reported having no problems; and 11 persons (7%) did not express an opinion.

The list of problem areas mentioned by the interviewees as regards protane gas service are as follows:

1. Inefficient service and erratic delivery was mentioned 58 times;
2. limited quantities available was mentioned 51 times;
3. high cost was mentioned 19 times;
4. one-man monopoly control of the product was mentioned 9 times.

Opinions regarding the costs and problems or inconveniences in obtaining protane gas lead 55 persons (31%) to think that this product

constitutes a serious problem for the island and 52 persons (35%) to think that it is a very serious one. Fourteen persons (14%) think of the protane gas situation as not very serious while 9 persons (6%) do not consider it to be a problem. Twelve persons (8) did not express an opinion.

To complete the findings as regards the sample's perception of Culebra's energy situation, the interviewees were asked to compare Culebra's energy needs and resources with those of Puerto Rico. The responses reveal that 59 persons (39%) feel that Culebra's energy situation is more serious than that of Puerto Rico; 34 persons (23%) evaluate the energy situation as comparable; and 37 persons (25%) evaluate Culebra's situation to be less serious than that of Puerto Rico. Twelve persons did not respond.

Two relatively recent measures have been implemented to deal with Culebra's electricity problems: and underwater cable from Puerto Rico to Culebra and an experimental windmill. The interviewees were queried about their knowledge of these measures. It was found that 83 persons (55%) understood the windmill to be an experimental project; 44 persons (29%) stated that the device was installed to provide additional electricity for the island; 22 persons (15%) did not know the windmill's purpose; and one persons informed that the windmill provides electrical energy to Puerto Rico. Consequently, 91 persons (61%) feel that the windmill has not helped the problem of electricity; and 26 persons (16%) do not know whether or not the windmill has been of any use. Another 19 persons (13%) feel that the windmill has had some utility; and 14 persons (9%) feel that it has helped to solve the energy problem.

The opinion that the windmill has not aided or has only partially resolved the electricity problem is based on the following reasons.

1. the project is experimental in nature and has yet to solve certain technical problems;
2. the windmill is defective and simply does not function;
3. the device does not generate sufficient electrical energy for the island's needs.

The sample's evaluation of the underwater cable is significantly different. In this case, 125 persons (83%) expressed the opinion that the cable has definitely helped resolve the island's electricity problems. Only 22 persons (15%) consider the cable as a partial solution. Of the total sample, 4 persons did not respond. This evaluation is based on the following considerations:

1. the cable has increased the amount of electricity available to the island's residents;
2. the voltage is more stable and less erratic;
3. there has been a decrease in the number of outages; and
4. an increase in electricity has attracted new industries to the island.

Given the fact that the Culebra Project is a community-based endeavor, it was deemed pertinent to obtain information about the interviewee's knowledge and evaluation of the Project and other similar endeavors. The results revealed that 84 interviewees (56%) were familiar with the community action groups in Culebra. The remaining 63 persons (42%) were not aware of the existence of such groups. Of the portion of the sample that was not aware of community-action groups, the reasons given as to why they thought no groups were working on Culebra's problems were: resident's apathy, ignorance

of the community's problems; partisan divisions; and lack of support from outside the community.

Among those persons familiar with community action groups, the groups most frequently mentioned were:

1. Comité Pro Rescate was mentioned 26 times;
2. Comité Pro-Ferry was mentioned 14 times;
3. Comité Pro-Vivienda was mentioned 12 times;
4. and Culebrense Unidos was mentioned 8 times.

The work of all groups was evaluated as positive.

Concerning the Culebra Energy Committee, it was found that 103 interviewees (69%) did not know of the Committee's existence. The informed sector of the sample understood that the Committee's principal goals are:

1. to stimulate citizen participation to find solution to the island's energy problems;
2. to provide information about conservation to reduce energy costs.

It should be indicated, however, that of the 47 persons that had heard about the Committee, 25 were not familiar with its goals.

As a final note, the majority of the sample (81 persons for 54%) expressed the opinion that the government is the most appropriate agent to initiate action to alleviate Culebra's energy problems. To a lesser degree, 53 persons (35%) felt that the appropriate agent is the Culebra community, and seven persons (5%) assign the responsibility to selected individuals. Sixteen persons (11%) proposed a combination of the previously mentioned alternatives.

The interviewees were asked their opinion as to whether or not they favored experimental solar and wind energy projects for Culebra. The majority (117 persons for 28%) answered affirmatively. An additional

14 persons (9%) were indifferent to the proposal. The explanation behind these responses are summarized as follows:

1. experiment's could reduce energy costs to the individual and community;
2. available and abundant resources (sun and wind) should be used to produce energy;
3. experiments would increase Culebra's energy supply;
4. windmill experiment is seen as a failure and; therefore more experimental projects are not needed.

Nonetheless, should these projects be in the offing, the residents make the following choices as to who should be responsible for initiating them:

1. Electric Power Authority was mentioned 44 times;
2. Puerto Rican government was mentioned 32 times;
3. Culebra Energy Committee was mentioned 28 times;
4. Culebra municipal government was mentioned 16 times;
5. Puerto Rican legislature was mentioned 7 times;
6. Combination of above alternatives was mentioned 11 times;
7. The alternative "do not know" was mentioned 19 times.

The sample's opinions as to the principal funding sources for these projects were as follows:

1. Federal government was mentioned 66 persons (44%);
2. Puerto Rican government was mentioned by 41 persons (27%);
3. Electric Power Authority was mentioned 17 times (11%);
4. Culebra municipal government was mentioned 5 times (3%);
5. Combination of above alternatives was mentioned 5 times (3%);
6. Did not know was mentioned 14 times (9%).

Turning our attention to information levels about specific energy sources to produce electricity, we find that the three most commonly known resources are oil, wind energy, and coal. It should be made clear that this information refers to knowing that such resources exist but not how they can be used to produce electricity (See Table 1).

TABLE I: INFORMATION LEVELS ABOUT ENERGY SOURCES

ENERGY SOURCE	COLUMN # I*		COLUMN # 2**	
	% INFORMED PERSONS	% NON-INFORMED PERSONS	% INFORMED PERSONS	% NON-INFORMED PERSONS
OIL	90%	10%	80%	20%
WIND ENERGY	85%	15%	30%	70%
COAL	80%	20%	70%	30%
NUCLEAR ENERGY	59%	41%	10%	90%
HIDRO-ELECTRIC ENERGY	55%	45%	5%	95%
BIO-MASS	35%	65%	3%	97%
BIO-GAS	35%	65%	3%	97%
THERMAL-OCEANIC ENERGY	34%	66%	2%	98%
SOLAR BATTERIES	33%	67%	1%	99%

* Persons that have or have not heard mention specific energy sources used to produce electricity.

** Persons that know or do not know how specific energy sources are converted to electricity. These figures are tentative estimates based on minimal information provided by the interviewee.

This same limitation is applicable to knowledge as regards solar heaters. In this case, 127 interviewees (85%) have heard the term but only 50 persons (39%) could explain how the solar heaters function.

The most cited energy sources thought as viable to resolve Culebra's energy problems are as follows:

1. wind energy was mentioned 105 times;
2. oil was mentioned 75 times;
3. coal was mentioned 41 times;
4. solar energy was mentioned 30 times;
5. thermal oceanic energy was mentioned 25 times;
6. solar batteries were mentioned 24 times;
7. and bio-gas was mentioned 9 times.

It is interesting to note, that 133 persons (89%) expressed interest in additional information about energy sources. More specifically, the most cited energy sources about which additional information was solicited are:

1. wind energy mentioned 68 times;
2. thermal oceanic energy mentioned 41 times;
3. solar energy mentioned 39 times;
4. solar batteries mentioned 28 times;
5. coal mentioned 25 times;
6. biomass mentioned 20 times;
7. oil mentioned 19 times;
8. nuclear energy mentioned 10 times.

VII. CONSERVATION OF ENERGY

This section of the questionnaire dealt with energy conservation in terms of whether or not the interviewees felt that energy should be saved; what specific measures if any the sample was implementing;

and the estimated economic benefits derived from such measures. Furthermore, data was obtained regarding energy saving measures known to the interviewees and the sample's interest in acquiring additional information as regards energy conservation measures.

Of the 150 persons interviewed, 129 reported (86%) the opinion that a need existed to foment conservation of energy in Culebra. Only 14 persons (9%) do not perceive the need to save energy; and 7 persons (5%) did not have an opinion on the matter. Furthermore, 121 persons (81%) have adopted energy-saving measures; 24 persons (14%) did not report having taken any measures; and 8 persons (4%) do not know if they have or have not implemented such measures.

The conservation measures taken by Culebrans to save electricity are:

1. Eliminate or reduce wattage of light bulbs;
2. reduce use of certain electrical appliances such as air conditioner, freezers, water heater, and ice-makers;
3. the practice of disconnecting or substituting certain appliances.

These measures are felt to represent an average reduction of $10.00 in the monthly light bill.

As regards the conservation of gasoline, the interviewees reported using their cars less, walking, use of small vehicles such as Japanese cars, motorcycles and bicycles. These measures represent an average saving of $10.00 a month. In addition, residents reported limiting their cooking to one meal a day, using wood or charcoal instead of a stove, restricting the use of the oven as the principal techniques used to save protane gas. These measures represent a $10.00 per month cost reduction. It should be noted that between 3 and 5%

of the persons using energy saving measures have no idea how much they save or feel that they do not reduce their energy bills.

Approximately, 30 persons (20%) know of other energy-saving measures, but do not use them. These include: use of public transportation, windmills, solar heater, use of charcoal and wood. Such measures are not being used because the residents report that the service does not exist; inconvenience; lack of information; and cost of these measures.

It is important to note that 137 persons (91%) of the interviewees would be interested in additional information about energy-saving measures, and 13 persons (9%) are not interested.

VIII. PROFILE OF THE WORKSHOP PARTICIPANTS

As indicated previously, 17 persons (11%) of the total sample attended the five alternate energy workshops. On the whole this group exhibits the same characteristics as the total sample. However, it is important to indicate those characteristics that significantly differentiate the workshop participants from the sample interviewed who do not attend the workshops.

While age distribution, marital status, and family size are similar in both groups, it is found that the workshop participants were more frequently male (12 participants) with a higher level of education and income that those who did not attend the workshops. The average educational level of the total sample is from one to four years of high school training; whereas among the workshop participants, eight persons received a high school diploma, seven per-

sons have three or more years of university education; and two persons have completed elementary school.

As regards the average income, the workshop participants reported an average of $850 per month as compared to $600 reported income for the total sample. All of the workshop participants are presently employed with the exception of two persons who are retired. Among the workshop participants only two persons informed that they are receiving food stamps.

In terms of the residential unit, the majority of workshop participants live in concrete and wooden structures with zinc or metal roofs. More specifically, six persons live in concrete structures; eight persons reside in wooden and concrete structures; and two persons described their residence as of wooden construction. One of the workshop participants live in a trailer. In addition, ten of the workshop participant's houses has a zinc or metal roof, six houses have concrete roofs and only one house has a wooden roof.

The workshop participant's residences have the same number and types of energy-consuming appliances as those of the total sample and differ only in that most of the participants household reported two fans instead of one fan. (One fan was the average number of fan reported for the total sample interviewed).

The workshop participants estimate the monthly cost for electricity to be $40 in comparison with $12 for the total sample. There was evident a $10 per month difference between the workshop participant's monthly gasoline bill($60) and that of the total sample ($50). Ten of the 17 workshop participants, five persons identified the subsidy-granting institution to be the federal government and four persons understood that the insular government finances the subsidy.

Comparing the general perception of the workshop participants with that of the total sample concerning Culebra's energy crisis, no significant discrepancies were noted. Both groups agree that an energy problem exists. The two groups did, however, disagree in the ranking of the dimensions of the energy problem. The total sample establishes that electricity, gasoline and protane gas, in that order, are the most important energy problems. The workshop participants; however, established the following ranking of problems: protane gas, gasoline and electricity. The difference in ranking orders may be explained in that the workshop participants were of the opinion that the cost of protane gas was very high and caused them innumerable inconveniences while the cost and inconveniences of the island's electrical service for the workshop participants were evaluated as minimal.

One other area of discrepancy between the workshop participants and the total interviewed sample deals with the priorities each group establishes as regards viable energy sources to solve Culebra's energy problems. While both groups agree that wind energy and petroleum are their first and second choices, the workshop participants indicate thermal oceanic energy and solar batteries as their third and fourth options. The total sample, however, selected coal and solar energy as their third and fourth choices.

Both the workshop participants as well as the total sample interviewed responded positively to the proposal that Culebra be used as the site for wind and solar energy experimental projects and both groups manifested a need for additional information, concerning energy resources.

IX. CONCLUSIONS

1. The publicity used was highly effective in reaching 73% of the survey's sample. In other words, three out of four households knew that alternative-energy workshops were offered in Culebra. However, only 11% of the total sample attended an average of two workshops. All but one of these that attended positively evaluated the workshop's contents.
2. While 88% of the total population is interested in attending the Project's last workshop, previous attendance advises caution concerning these expectations. If future activities are to be planned that desire widespread citizen participation, they should be organized mindful of the main reason for non-attendance: work obligations. It is therefore suggested that future activities be held in different work-settings.
3. The great majority of interviewees feel that Culebra has energy-related problems having to do with electricity, gasoline and protane gas. However, when asked to evaluate the magnitude of these specific problems in terms of cost and inconveniences, gasoline is rated as a very serious problem, protane gas as a serious one and electricity as not too serious. This change in ranking may be due to two factors. First, large numbers of residents receive subsidies that offset having to pay the full cost of electricity. Second, the installation of the underwater cable has greatly minimized past inconveniences and problems related to electricity.
4. The interviewed population is of the opinion that wind energy, oil, coal and solar energy are the most viable resources to

solve Culebra's energy problems. Nonetheless, as indicated in Table #1, the sample lack basic information about alternate energy resources, but the same population is very interested in obtaining additional information particularly regarding wind, thermal oceanic and solar energy.

5. The interviewees responded very positively to having experimental alternate energy projects located in Culebra. They are of the opinion that these projects should be initiated by government agencies and financed principally by the Federal Government.

6. Given the relatively low-income levels of the Culebran community and the high cost of alternate energy technology, any attempt to introduce such technology would require that economic subsidies be provided in addition to existing tax incentives.

7. The sample reported having information about a variety of community-action groups, but few were informed about the Culebra Energy Committee. The Committee will have to correct this situation and in addition deal with a population that posits financial and planning responsibilities for such endeavor in agents or agencies outside the community.

8. Finally, the majority of Culebrans believe that energy should be conserved, and indicated that they personally have taken steps in this direction. Nonetheless, the overwhelming majority of the sample is interested in additional information about energy-conservation measures.