

EVALUATION SURVEY OF CULEBRA PROJECT

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CENTER FOR ENERGY AND ENVIRONMENT RESEARCH 5

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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 to exchange information about the energy crisis and alternative energy strategies. In November 1961, 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 alternative energy projects. The following report contains the results of the evaluation performed.

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 representation of 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 the area.
4. Knowledge and use of energy conservation measures.
5. Descriptive features of the interviewees' household relevant to energy consumption.

The project's staff met on two occasions to revise the questionnaire. This 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 businesses. Although the advertisement specified that applicants should have previous interviewing experience, only eight out of eleven had this experience.

On November 2, 1961, 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 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, 1961). 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.

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The sample surveyed consists of 150 persons distributed between 84 men (56% of the sample) and 66 women (44%). The range in ages of

The sample consists of individuals ranging from 19 to 71 years of age. The age breakdown is as follows:

- 19-29 years -- 30 persons, accounting for 20% of the sample
- 30-39 years -- 55 persons, accounting for 37% of the sample
- 40-49 years -- 26 persons, accounting for 16% of the sample
- 50-59 years -- 31 persons, accounting for 21% of the sample
- 60 and over -- 10 persons, accounting for 6% of the sample

The sample includes individuals with a wide range of educational backgrounds, ranging from 4% of the sample with no formal education; 45% having 1 to 8 years of schooling; 36% reporting 9 to 12 years of schooling; and 16% of the sample with university education.

In terms of family structure, the average household consists of four individuals, ranging from single-person households to both spouses and two children between the ages of one and ten.

The economic characteristics of the sample reveal 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 housewives (10 persons) identifying themselves as unemployed. The employed sector of the sample predominantly works 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. According to the interviewees, 38 out 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 predominantly young (less than 39 years of age), married, and in their most productive and reproductive period.

The information on 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 (58%) 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. 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 = 18 persons (34%) 3) gas stove = 37 persons (37%) 4) radio = 58 persons (58%) 5) iron = 135 persons (80%) 6) fans (average of one fan per house) = 98 persons (98%) 7) washing machine = 79 persons (79%) 8) record player = 63 persons (63%) 9) toaster = 46 persons (46%) 10) water heater = 9 persons (9%) 11) air conditioners = 12 persons (12%) 12) electric stove = 13 persons (13%) 13) clothes dryer = 2 persons (2%).

The appliances most often found in the sample's homes are electric refrigerators, gas stoves, 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 propane 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 determining the effectiveness of publicity used. Three strategies were devised to disseminate information about the project and workshops: letters sent to box-holders at the Culebra Post Office, radio programs and spots, and direct contact with residents in the community.

The figure of monthly costs is suspect as an estimate since a tank of 25 costs about \$43 and for most people, a tank should last from two to three months.

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

In regards to attendance at the workshops, it was found that 17 people attended an average of two workshops. The workshops attracted 165 of the informed sector of the sample. This proportion represents, however, only 11% of the total sample.

Among the informed portion of the sample, 56 people (51%) knew of others who had attended the workshops, while only 39% reported receiving 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 workshops.

Of the informed sector, 27% reported having personally urged other people to attend the workshops and approximately the same percentage (30%) spoke to other people about the workshops. The comments made to other people 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.

Regarding the 17 individuals who attended one or more workshops, the questionnaire revealed that the first workshop stimulated 15 of them to attend another one. These same 15 people perceived that they had obtained new or additional information about the energy crisis and alternate energy sources. The newly acquired knowledge was in the areas of:

1. The energy crisis in general.
2. Specific alternate energy sources and devices, such as windmills, solar heaters, and solar desalinization processes.
3. Conservation measures to reduce energy consumption and costs.

When asked if this new information had been used in some way, only one person reported that they had visited a plant that manufactures windmills and had solicited a wind-measuring device. Those who attended the workshops reported that the most important topics discussed were solar energy, windmills, cost, and energy conservation. This same group expressed concern that certain topics they deemed important were not adequately covered in the workshops. These topics included the cost and financing of alternate energy devices and the most appropriate alternate energy sources for Culebra.

It should be noted that four of the 17 individuals who attended the workshops believed that the sessions had included all of these topics and that all were important and relevant. Those who did not attend any of the workshops cited the following reasons for not attending:

1. Work-related situations, including conflicts between the workshop schedule and employment, and fatigue after work.
2. Other commitments such as religious meetings, childcare, and previously undefined engagements.
3. Lack of interest, illness, and lack of information, including not having received an invitation letter

or receiving the information after the date of the activity.

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

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 problem. The three most important energy problems reported by island residents are: electricity was mentioned 69 times, gasoline received 55 mentions, and propane gas was mentioned 55 times. While not among the top three energy problems, it should be noted 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 sample, 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 experiencing 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 were 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 the cost of and problems with electricity, 59 persons (39%) evaluate electricity as a relatively minor problem; and 38 Persons (25%) do not consider electricity a problem. Of

The sample of 28 persons (19.8%) 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 propane gas services. Gasoline is purchased by 107 persons (71.2%). 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. 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%) perceive 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 propane gas, 124 persons (83%) buy propane 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 (7%) 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

The concerns mentioned by the interviewees regarding propane 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 propane gas led 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 propane 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 regarding 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: an underwater cable from Puerto Rico to Culebra and an experimental windmill. The interviewees were asked about their knowledge of these measures. It was found that 89 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 purposes and one person informed that the windmill provides electrical energy to Puerto Rico. Consequently, 61 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%)

I feel that the windmill has had some utilities and 14 people (94%) feel that it has helped to solve the energy problem.

B. 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 people (83%) expressed the opinion that the cable has definitely helped resolve the island's electricity problems. Only 22 people (15%) consider the cable as a partial solution. Of the total sample, 4 people 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.
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 people (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: Comité Pro Rescate was mentioned 26 times; Comité Pro-Ferry was mentioned.

The text was mentioned 14 times; Comité Pro-Vivienda was mentioned 12 times; 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 solutions 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 or 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 or 28%) answered affirmatively. An additional 14 persons (9%) were indifferent to the proposal. The explanation behind these responses are summarized as follows: 1. experiments 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: Electric Power Authority was mentioned 40 times; Puerto Rican government was mentioned 32 times; Culebra Energy Committee was mentioned.

The corrected text is as follows:

The Culebra municipal government was mentioned 28 times; Puerto Rican legislature was mentioned 16 times. The combination of the above alternatives was mentioned 11 times. 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: Federal government was mentioned by 66 persons (48%); Puerto Rican government was mentioned by 41 persons (27%); Electric Power Authority was mentioned 17 times (11%); Culebra municipal government was mentioned 5 times (3%); A combination of the above alternatives was mentioned 5 times (3%). "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).

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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: wind energy was mentioned 105 times; oil was mentioned 75 times; coal was mentioned 41 times.

(Note: The part between the two page breaks seems to be in a different language or coded, and I can't correct it without knowing what it's supposed to say.)

Solar energy was mentioned 30 times; thermal oceanic energy was mentioned 25 times; solar batteries were mentioned 24 times; and bio-gas was mentioned 9 times. It is interesting to note that 133 persons (89.2%) 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. solar, mentioned 19 times and 8. nuclear energy, mentioned 10 times.

VI. 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 regarding energy conservation measures.

Of the 150 persons interviewed, 129 (86.2%) reported the opinion that a need existed to promote conservation of energy in Culebra. Only 14 persons (9.2%) 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 (14.2%) did not report having taken any measures; and 8 persons (4.2%) 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 more, and using smaller vehicles such as Japanese cars, motorcycles, and bicycles. These measures represent an average saving of \$10.00 per month. Additionally, residents reported limiting their cooking to one meal per day, using wood or charcoal instead of a stove, and restricting the use of the oven as the principal techniques used to save propane gas. These measures represent a \$10.00 per month cost reduction. It should be noted that between 3 and 5 out of 19 of the people using energy-saving measures have no idea how much they save or feel that they do not reduce their energy bills. Approximately, 30 people (20%) know of other energy-saving measures, but do not use them. These include the use of public transportation, windmills, solar heaters, and the use of charcoal and wood. Such measures are not being used because the residents report that the service does not exist, there are inconveniences, lack of information, and cost of these measures. It's important to note that 137 people (91%) of the interviewees would be interested in additional information about energy-saving measures, and 13 people (9%) are not interested.

PROFILE OF THE WORKSHOP PARTICIPANTS

As indicated previously, 17 people (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's 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 was found that the workshop participants were more frequently male (12 participants) with a higher level of education and income than 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 people received a high school diploma, seven people...

20 sons have three or more years of university education, and two individuals have completed elementary school. As for the average income, the workshop participants reported an average of \$850 per month, compared to \$600 reported income for the total sample. All of the workshop participants are currently employed, with the exception of two people who are retired. Among the workshop participants, only two individuals stated that they are receiving food stamps.

In terms of residential units, the majority of workshop participants live in concrete and wooden structures with zinc or metal roofs. More specifically, six people live in concrete structures, eight people reside in wooden and concrete structures, and two individuals described their residence as wooden construction. One of the workshop participants lives in a trailer.

In addition, ten of the workshop participants' houses have zinc or metal roofs, six houses have concrete roofs, and only one house has a wooden roof. The residences of the workshop participants have the same number and types of energy-consuming appliances as those of the total sample and differ only in most of the participants' households reporting two fans instead of one fan. (One fan was the average number of fans 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 a \$10 per month difference between the workshop participants' monthly gasoline bill (\$60) and that of the total sample (\$50).

Of the 17 workshop participants, ten people identified the subsidy-granting institution to be the federal government, and four people 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

The text seems to contain various spelling, punctuation, and grammar errors. Here's the corrected version:

They did, however, disagree on the ranking of the dimensions of the energy problem. The total sample established that electricity, gasoline, and propane, in that order, are the most important energy problems. The workshop participants, however, established the following ranking of problems: propane gas, gasoline, and electricity. The difference in ranking orders may be explained by the fact that the workshop participants were of the opinion that the cost of propane 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 regarding viable energy sources to solve Culebra's energy problems. While both groups agree that wind energy and petrol 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 and 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 expressed a need for additional information concerning energy resources.

2. Conclusions

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 those who attended positively evaluated the workshop's contents. While 68% 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 should be organized with mindfulness of the main reason for non-attendance: work obligations. Therefore, it is suggested that future activities be held in different work settings. The great majority of interviewees feel that Culebra has energy-related problems having to do with electricity, gasoline, and propane 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, propane 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.

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 lacks 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. 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 primarily by the Federal Government.

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. 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 challenges.

Responsibilities for such endeavor rest with agents or agencies outside the community. 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.