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HAWAIIAN ATTITUDES TOWARD GEOTHERMAL DEVELOPMENT

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ABSTRACT

The results of a survey of the attitudes of a Hawaiian Community toward geothermal development are described. The survey was conducted by a grassroots community organization, and high response rate (85%) provides a good representation of community sentiment. The findings in general suggest a substantial polarization of attitudes toward the possible effects of geothermal development and toward potential uses of the geothermal resource. There is evidence of a balancing of perceived economic advantages of development against a long list of perceived negative effects on the physical, social and cultural characteristics of the community. Implications of the findings for assessing the social and cultural impact of geothermal development on the Puna Hawaiian Community are discussed.

INTRODUCTION

The Puna Hui Ohana is an organization of the Hawaiian Community of the Puna district of the Island of Hawaii. Its function is to address the needs of the youth, young adults, parents and elders of the community. The Hui's interest in geothermal development grew out of the public's concern over recent discoveries of geothermal potential in Puna, and the subsequent land-lease negotiations for geothermal rights. The activities of land speculators and pressure from agents representing several interested oil companies prompted 44 Native-Hawaiian land owners to appeal to the Puna Hui Ohana for advice, guidance, and an investigation of the overall implications of geothermal development in Puna.

Native Hawaiian rights groups were also expressing serious interest in the question of ownership of the geothermal resource. In addition they were concerned about traditional Hawaiian beliefs regarding the uses of the geothermal steam. For example, it was suggested that Madame Pele, the Hawaiian fire goddess, would be offended by geothermal drilling with potentially disastrous consequences for the Puna community.

The concerns described above were voiced by a number of Hawaiians, including representatives of the Puna Hui Ohana, at the Geothermal Resources Council Annual Meeting held in Hilo in July, 1978. The Department of Energy staff attending the conference indicated a willingness to consider funding a proposal from the Hawaiian Community to conduct a study to address the social and cultural implications of geothermal development for Aboriginal Hawaiians. A proposal submitted by the Puna Hui Ohana was funded by the Department of Energy; and the present paper summarizes a portion of the results of that study.

The present study describes the responses of the members of the Puna Hawaiian community to a set of attitude survey questions about the perceived impact of geothermal development, potential uses for and ownership of the geothermal resource, quality of life in Puna, and cultural characteristics of the Hawaiian community which might be affected by geothermal development. The aims of the survey were to collect data which would accurately describe the attitudes of the Hawaiian Community toward geothermal development, and to gather predevelopment baseline data about the Community.

METHOD

Sampling

The target area for the survey was defined by the Lower Puna census tract (Pahoa-Kalapana). A house-to-house census of the area was completed by the members of the Hui to identify all Hawaiians living in Lower Puna. Questionnaires were administered to all adult (18 years of age or older) Hawaiian and Part-Hawaiian residents of the area who could be located and who were willing to complete the questionnaire.

Data Collection

For organizational purposes Lower Puna was divided into six geographic areas with a team leader coordinating the survey administration in each area. The questionnaires were individually delivered and collected by a member of the Hui. In most cases, the survey team member knew the person completing the questionnaire. Information was provided by the respondent anonymously on the survey form, and the survey was returned in a sealed envelope.

Training for the members of the survey team consisted of three meetings in which questionnaire content, administration procedures, and potential problems were discussed.

Questionnaire Construction

Questionnaire items used a closed question format following a modification of the Consequence Analysis procedure (Sanford & Fawcett, in press) for community impact analysis. This procedure asks the respondent to indicate both the magnitude of the perceived effects of development (i.e., large or small), and the value of such effects (i.e., good or bad). Magnitude of impact is judged on a five-point scale and value of impact is judged on a seven-point scale. For questions about the potential uses of the geothermal resource only the seven-point value scale was used.

The final questionnaire was a refinement of an earlier instrument used to assess the impact on a group of 15 Hawaiian leaders of a visit to geothermal fields in New Zealand. The survey instrument was piloted three times with the Puna Hui Ohana Board of Directors and Project Advisory Board to clarify wording and item structure, and to be sure that all relevant topics were included.

The first section of the questionnaire addressed attitudes toward geothermal development. The second section addressed lifestyle, cultural practices and values of the Hawaiian Community.

The content of the items on the questionnaire was determined by a review of the literature about numerous discussions by the Hui Board of Directors about Community concerns, and from the information acquired from the earlier survey.

RESULTS

The census of the Community identified a total of 413 Hawaiian or Part-Hawaiian adults in Lower Puna. An attempt was made to contact each adult Hawaiian personally to explain the rationale for and nature of the survey, and to solicit their cooperation in completing the questionnaire. This procedure led to a return-rate of 85% (351 questionnaires). Missing data is due to an inability to contact the respondent, the respondent's refusal to complete the questionnaire, or to a blank questionnaire being returned to the survey team member.

The 1980 Federal Census identified 1712 households and 4696 individuals in the Lower Puna census tract. The adult respondents who completed the questionnaire represent 255 households in which 928 people reside. The survey thus includes data from 14.9% of the households and 19.8% of the population of Lower Puna.

Sources of Information about Geothermal Development

Respondents were asked about their level of knowledge about geothermal development. The majority felt that they had a small (25%) or moderate (30%) amount of information, with relatively few perceiving themselves as having large (8.5%) or very large (4.5%) amounts of information. Almost 30% of the Community reported having either a very small amount or no information about geothermal development.

The newspaper was clearly the most common source of information about geothermal development for the Lower Puna Hawaiian Community. Two-thirds of the respondents indicated the newspaper as a source of information, with radio (47%), friends (42%) and television (37%) also frequent sources. Thirty percent of the respondents reported receiving information directly from the Hui, while only 13% had attended geothermal workshops or conferences.

While the sources described above provide secondary information about geothermal development, it is also possible to gain information firsthand by visiting the HGP-S wellsite in Puna or by visiting some other geothermal field. Slightly less than half (49%) of the members of the Lower Puna Hawaiian Community reported having visited the HGP-S wellsite, while even fewer (7.3%) had visited some other geothermal field. It seems clear that media reports and other sources of indirect experience have provided most of the information to the Community to date, and that direct experience has played a relatively minor role in the formation of attitudes toward geothermal development.

Perceived Impact of Geothermal Development

The questionnaire asked each respondent to rate both the magnitude and the favorability of a number of possible effects of geothermal development in Puna. Table 1 summarizes the attitudes expressed toward these possible impacts.

Table 1

PERCEIVED IMPACT OF GEOTHERMAL DEVELOPMENT

GOOD*	NEITHER GOOD NOR BAD	BAD*
Economy	Social Conditions	Hawaiian Culture
	Community Closeness	Historical Sites
	Employment	Traditional religion
	Overall Impact	Hunting, Fishing Gathering
		Traffic
		Agricultural Land
		Land Taxes
		Physical Environment
		Quakes/Eruptions
		Plants/Animals

*All impact categories reported show nonchance ($p<.05$) frequencies in the indicated direction using a binomial test of significance.

The economic impact of geothermal development was perceived as positive, but all other effects were perceived as either negative or neutral. It is particularly interesting that the item asking about the overall effect of geothermal development falls in the neutral category, given this ten to one ratio of perceived negative to positive effects. This apparent contradiction is clarified somewhat by the information in Table 2, which shows that only 18.5% of the sample actually perceived the overall impact to be "neither good nor bad."

TABLE 2

DISTRIBUTION OF RESPONSES TO "NEUTRAL" IMPACT ITEMS

IMPACT CATEGORY	RESPONSES			
	GOOD %	NEITHER %	BAD %	NO RESPONSE %
Overall	(32.5)	(18.5)	(40.2)	(8.83)
Social Conditions	(35.6)	(21.9)	(34.5)	(7.98)
Community Closeness	(31.3)	(31.9)	(27.4)	(9.40)
Employment	(38.5)	(19.9)	(30.5)	(11.11)

Forty percent of the Community perceive an impact on the "bad" side of the continuum and 32.5% perceive an impact on the "good" side of the continuum. While the average of these values falls in the "Neither good nor bad" category, this position does not reflect the views of three quarters of the sample. A similar conclusion can be drawn from the distribution of responses to each of the other three apparently "neutral" items. This polarization of attitudes is not limited to the four "neutral" impact categories. Both age and number of years of residence in Puna were investigated as variables which might account for the variability in the data; however neither of these variables was systematically related to attitudes toward development.

In addition to questions about the favorability of the possible impacts of geothermal development respondents were asked to rate the expected magnitude of the impacts. Responses were consistently near the "large" end of the continuum for all categories, regardless of whether the value of the impact was perceived to be good or bad.

Uses of Geothermal Energy

The six uses of geothermal energy which have been most frequently proposed for Hawaii were presented to respondents for their evaluation on a seven-point scale from good to bad. Table 3 presents the results of this evaluation.

TABLE 3

ATTITUDES TOWARD POTENTIAL USES OF GEOTHERMAL ENERGY

GOOD*	NEITHER GOOD NOR BAD	BAD*
Agriculture/ Aquaculture	Electric Power for Oahu	Large Industries
Small Industries	Hotels/Spas	
Electric Power for Big Island		

*All impact categories reported show nonchance ($p<.05$) frequencies in the indicated direction using a binomial test of significance.

The favored uses imply either support of existing Island needs and activities (i.e., agriculture, Bit Island electric power) or relatively small scale industrial activities, rather than large scale development.

Ownership of the Geothermal Resource

In response to the question of who should own geothermal energy and receive the income from it, the majority (52.4%) of the respondents indicated Native Hawaiians. In order, the other choices were the surface land owner (23.8%), the owner of the mineral rights for the land (12.5%) and the State government (11.38%).

Quality of Life in Puna

In order to assess the degree of satisfaction among members of the Hawaiian Community with their present lifestyle, respondents were asked to indicate on a seven-point scale how happy or unhappy they were with the quality of life in Puna. Responses to this question produced greater concensus than did those to any other question in the survey. The great majority (81.9%) responded that they were happy with the present quality of life in Puna, while only 9.5% were unhappy, and 8.6% were neither happy nor unhappy.

Attitudes of Subgroups Within the Community

Information available about the background of the Community members makes it possible to investigate potential differences in attitudes for different subgroups of the Community. The variables of particular interest are 1) whether either HGP-A or other geothermal wells have been visited, 2) the amount of information people believe they have about geothermal development and 3) the geographical area of Lower Puna in which people reside.

Approximately one-half of the sample had visited the HGP-A wellsite; however the responses to the survey questions for those who have visited HGP-A did not differ from those who had not.

Twenty-five people indicated that they had visited a geothermal well other than HGP-A. At least 17 of these people would have seen the geothermal fields in New Zealand. Those who had visited other sites rated large industrial uses as more negative than those who had not, and they also perceived a more negative impact on Hawaiian culture.

A relationship was found between the amount of information that respondents felt they had about geothermal development and their overall attitudes toward it; but the relationship is not a simple one. Those who reported having either "very small" or "large" amounts of information had more negative overall preceptions than did those who reported "very large," moderate," "small" or "no information." In addition, those feeling they had "large" amounts of information perceived large industrial use of the geothermal resource as more negative than did the other groups.

The final variable, geographical area of residence in Puna, did not reflect differences in attitudes toward either the expected impacts or the uses of the geothermal resource.

DISCUSSION

The picture of the Lower Puna Hawaiian Community which emerges from background information provided by the survey is one of a community with many young families, and one which has grown substantially during the last 10 years. Occupational status varies considerably, formal education is typecally completed with high school graduation, and approximately one fourth of the adult Community receives social services from government or private agencies. What is the relationship of these characteristics to the possible effects of geothermal development in Puna?

One of the most stable of the findings of the survey was that the Hawaiians of Lower Puna are quite satisfied with the present quality of life in their community. The second major point of agreement among the respondents was that the impact of geothermal development would be large in scale. However, a consensus about the desirability of these potentially large impacts was not so readily apparent. There seems to be a balancing of the potential economic benefits of geothermal development with the environmental and social costs of development; and there is considerable polarization of attitudes. This situation is not unique to the Puna Hawaiian Community, and has also been described among the residents of Lake County in the Geysers geothermal field in California (Vollintine & Weres, 1976). A large number of impacts were perceived as negative by the respondents; and only one, economic impact, was reported to be clearly positive. It is not clear from the survey exactly what the respondents see the economic gains to be, especially since they were fairly evenly divided on the impact of development on jobs for Hawaiians (43% positive, 22% neutral, 34% negative). While only 8.5% of those answering a question about employment indicated that they were unemployed, 16% did not answer the question, fully 48% of those responding were not engaged in income-generating work. There may be a sizeable need for employment opportunities among the members of the Hawaiian Community, but there is considerable disagreement about whether geothermal development would meet this need. It is interesting that this issue generated one of the highest frequencies of write-in comments. Most of these comments can be summarized by one respondent's statement that the jobs would be "not for Hawaiians" but "for Haole and Japanese only". It would seem that the high school educated residents of this rural Community do not necessarily see the highly technological geothermal industry as an answer to their employment needs.

Of particular interest in assessing the cultural impact of geothermal development is the extent to which the Community members engage in traditional subsistence activities which could be in conflict with geothermal use of the land. There is reported a high frequency of such activities with a majority of the sample fishing (66%), shoreline collecting (62%) and food gathering (59%). The practices of gathering medicinal plants (48%), gathering maile (38%) and hunting (38%) are also quite common.

The impact of geothermal development on the traditional culture of the Puna Hawaiian Community is likely to focus on conflict over the use of the land in culturally congruent ways, and the potential interference with the application of certain Hawaiian cultural values. The importance of the land to the modern Hawaiian resident of Puna comes through very clearly both in the questionnaire responses and in the numerous write-in comments about the use and meaning of the land for the Hawaiian. Many traditional cultural activities require access to fairly large areas of land that is "underveloped" in the Western sense, but highly productive of things necessary for the practice of traditional Hawaiian culture.

CONCLUSION

The study which has been described was a Community-based approach to the assessment of attitudes toward geothermal development. It was sponsored by a grassroots Community organization, and the survey data was collected by its members. The survey instrument itself was created in continuous interaction with the Puna Hui Ohana Board of Directors to insure that it not only reflected their concerns about possible impacts of development, but also would be as clear as possible in wording and format to the people responding to it. Contrasting the 85% return-rate of the present study with the 31% return-rate for a similar study in Lake County, California (Vollintine & Weres, 1976) illustrates one clear advantage of taking the time to actively and meaningfully involve the Community in such undertakings. Information about community attitudes is necessary in order to plan geothermal development in a way that is responsive to community concerns and minimizes the social, cultural and economic costs to the affected community. It is recommended that such community involvement be a routine part of any new or expanded geothermal development.

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