THE PUNA COMMUNITY SURVEY :

VOLUME I: OVERVIEW

Presented to:

State of Hawaii
Department of Planning and Economic Development

and

County of Hawaii
Department of Planning

Presented by:

SMS Research, Inc.
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PURPOSE AND ORGANIZATION OF REPORT

SMS Research conducted the Puna Community Survey for the County of Hawaii Planning Department, utilizing Coastal Energy Impact Program funds provided by the Hawaii State Department of Planning and Economic Development. According to the original request for proposals from the County: "The purpose and intent of this survey is to obtain basic demographic information (about) the residents, in addition to their opinions, perceptions, and attitudes toward the future development of the (Puna) District, with a special focus on geothermal related activities."

In addition to its planning function, the survey can also assist the County's efforts to ensure effective social monitoring in the Puna district as geothermal development progresses there. It can help to guarantee adequate communication with Puna residents, whose district has been undergoing some of the most profound changes faced by any rural Hawaii area in the 1970's and 1980's. Because this was a random sample survey, it provides a representative "voice of Puna" on the planning and policy questions covered by the survey.

This report appears in two volumes. Volume I contains an overview of the findings, while Volume II presents detailed results. In accordance with the multi-purpose nature of this project, results in both volumes will be presented in three parts:

- Part I--General Planning and Demographic Information. Included in this part are discussions of Puna's population growth and composition; other demographic characteristics; labor force composition; travel in and out of Puna; shopping area preferences; and community commitment, involvement, and identity. This description of Puna's population is important for planning either geothermal or any other form of development in Puna.

- o Part II--General Opinions on Puna's Current and Future Situation (Context for Geothermal Attitudes). This part of the report deals with results of questions about the best and worst aspects of life in Puna today, and about opinions on a wide variety of future development prospects for Puna. These results will be valuable for general community development planning, and they also provide a crucial context for viewing results of questions about geothermal development.

- o Part III--Opinions on Geothermal Development and Geothermal-Powered Industry in Puna. The final part contains results of questions about development of geothermal and other industries which might be associated with the development of geothermal resources. It covers the awareness and perceived impacts of present geothermal drilling activities; com parative attitudes toward three separate scenarios for various levels of geothermal and industrial development in Puna; and opinions on a range of geothermal-related policy issues.

The appendices to Volume II contain a detailed discussion of methods used to conduct the survey and a copy of the survey instrument. A brief overview of the methods is warranted here.

SMS Research conducted a telephone survey of 778 Puna households between March 11 and April 20, 1982. This represented approximately one-fifth of all Puna households, for a maximum sampling error of $\pm$ 3.2 percentage point. A computer program randomly generated complete telephone numbers for working Puna prefixes, so that unlisted and new residential telephone numbers were included in the sample.

Five Puna "planning areas" were created in consultation with the County Planning Department. Boundaries of these areas are shown in Figure 1.

For the sake of convenience, these five areas will be referred to as (1) Kapoho-Kalapana; (2) Pahoa; (3) the "central subdivisions;" (4) Keaau; and (5) Kurtistown-to-Volcano or, sometimes, "mauka Puna." However, the reader should take care to examine Figure 1 so as not to be confused by the abbreviated names. For example, the Pahoa planning area also includes some subdivisions

north of Pahoa toward the sea, and the "central Subdivisions" planning area includes only those subdivisions between Pahoa and Keaau, not all Puna subdivisions.

Most of the survey results to be presented in this report are broken down by planning area. Additionally, SMS Research is providing the County of Hawaii Planning Department with a computer tape containing all data and will assist County personnel in setting up further analyses which may be desired, such as cross-tabulation of results by demographic items.

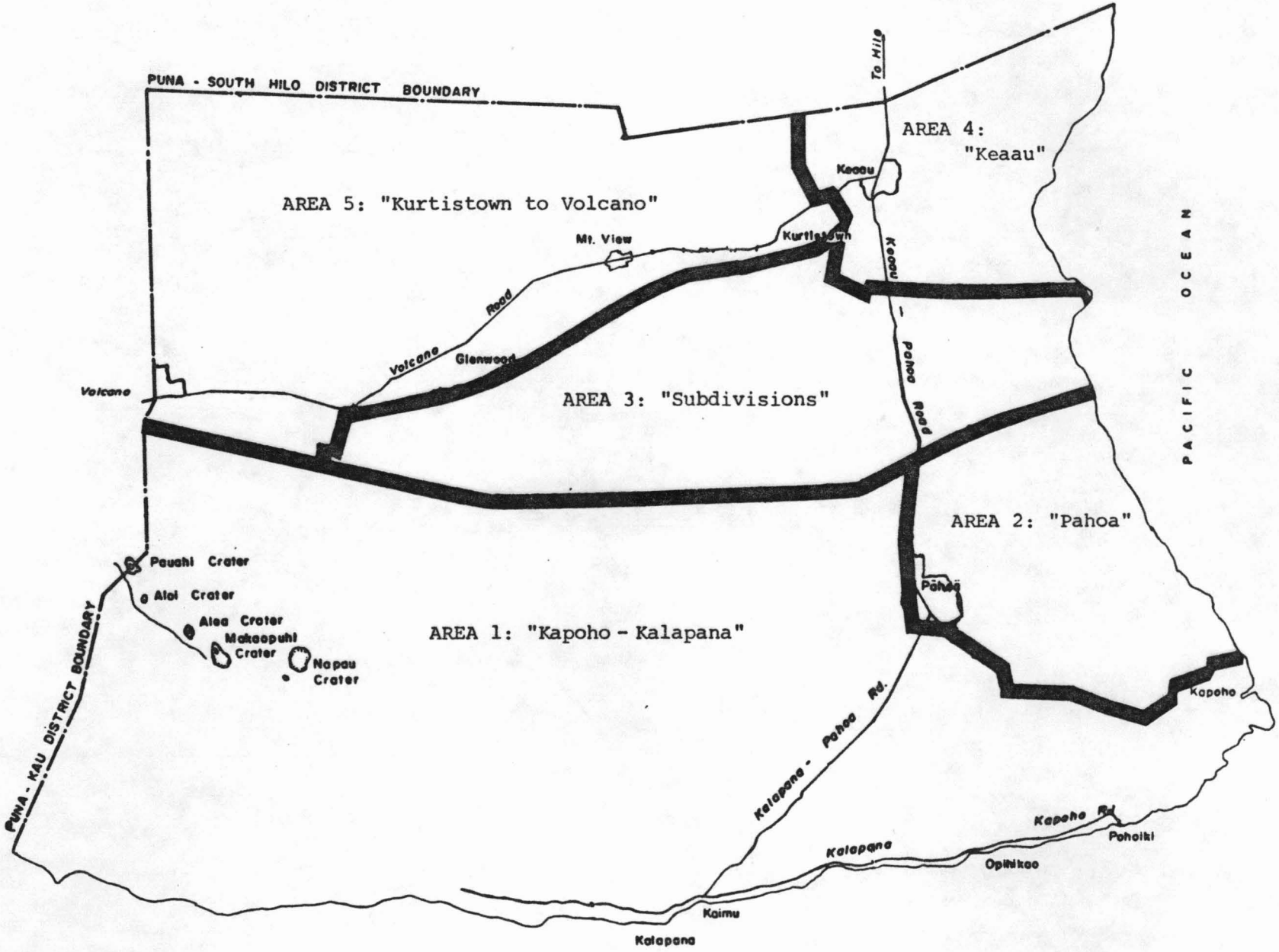

FIGURE 1: Map of Planning Areas

Table 1

Distribution of Respondents by Planning Area

	number	percent	sampling error *
Planning Area 1 -- Kapoho to Kalapana (includes all areas below Pahoa, such as Leilani Estates)	60	8	± 11.6
Planning Area 2 -- Pahoa (includes makai areas toward Hilo, such as Nanawale and Hawaiian Parks subdivisions)	258	33	± 5.4
Planning Area 3 -- Subdivisions (i.e., subdivisions between Pahoa and Keaau)	204	26	± 6.2
Planning Area 4 -- Keaau (includes surrounding agricultural lands toward Hilo and sea)	76	10	± 10.2
Planning Area 5 -- Kurtistown to Volcano (includes mauka subdivisions with principal access from Volcano Highway)	180	23	± 6.7
Total:	778	100	± 3.2

* Errors indicated are for sample results of 50 percent, when the maximum sampling error occurs. Errors are smaller when sample results are much smaller or larger (e.g., 20 percent or 90 percent). Also, any survey has the potential for "nonsampling error" — which cannot be measured -- due to phenomena such as selective nonresponse.

NOTE: Due to rounding error, percentages in these tables may not add to exactly 100 percent.

HIGHLIGHTS OF SURVEY RESULTS

Part I: General Planning and Demographic Information

- The Puna population contains large proportions of newcomers. In the survey sample, 21 percent had lived there for two years or less; a cumulative 47 percent had been there no more than five years; and only 21 percent had been in Puna for more than 20 years. Three-fourths of Puna's newcomers live in the central subdivisions, Pahoa, or Kapoho-Kalapana planning areas. By contrast, nearly 60 percent of the longtime residents were found in Keaau and mauka Puna. The greatest proportion of newcomers (40 percent) said they had moved to Puna from elsewhere on the Big Island, mainly Hilo. The next largest group (28 percent) had moved from the Mainland, primarily California and other western states.

- Ethnically, Puna has proportionately more Caucasians and fewer Japanese than the Big Island as a whole. This is particularly true in lower Puna (Kapoho-Kalapana, the Pahoa area, and the central subdivisions).

- Of Puna's household heads, 23 percent were retired; eight percent were unemployed or not working; 20 percent were in agriculture; 12 percent, in the construction industry; and eight percent, government workers. Not counting retirees and nonworkers, 30 percent of Puna's working household heads were in agriculture (11 percent in sugar and 19 percent in other forms of agriculture).

- The Puna lifestyle requires wheels. Nearly two-thirds of the sampled households had two or more working cars or trucks. Only three percent had none. More of the district's chief wage earners work outside Puna than inside it. Nearly three-quarters of the sample said they usually shopped in Hilo.

- Asked which Puna community should get more commercial development, 35 percent said Keaau and 23 percent named Pahoa. However, 25 percent said no new stores or businesses are needed. In an open-ended question about Puna's "most important problems," only two percent mentioned lack of stores and businesses.

- Despite the number of Puna residents who work and shop outside the district, there are several indicators of good community involvement and commitment. For example, 80 percent of the Puna respondents said they would continue to live in the district for the next five years, and only ten percent said they would definitely or probably move. And 13 percent of the households sampled--one out of eight--contained someone who had attended a planning-oriented community meeting in recent months.

- Another community identity question is whether residents of rural subdivisions identify with established nearby towns or only with their own subdivisions. More than half the subdivision respondents appeared to identify with their subdivision rather than a town.

- Keaau is probably the most demographically distinct community in Puna. It has the lowest median income and educational level; greatest percentage employed in sugar; highest average household size; fewest Caucasians and most Japanese and Filipinos; and, despite its proximity to Hilo, proportionately fewest residents traveling there to work or shop.

Part II: General Opinions on Puna's Current and Future Situation

- Asked to name the "best things" about living in Puna, nearly half the sample cited some aspect of Puna's rural, undeveloped nature. The second most frequent type of response (40 percent) involved Puna's weather, its scenic beauty, and lack of pollution. The third most popular type of answer (33 percent) had to do with social or lifestyle factors. Virtually nobody included geothermal development among their "best things" about Puna and only 11 percent referred to geothermal when asked to name several of the area's most important problems.

- The most frequently mentioned problems were economic in nature. Around Keaau, respondents were likely to make specific reference to the upcoming Puna Sugar plantation shutdown. In lower Puna, the terminology used most often was simply "lack of jobs." A combined 44 percent of the sample mentioned at least one of these two economic concerns. The next most frequently mentioned problems (27 percent) were those involving lack of services and facilities (27 percent), especially roads, water, and police service. Social problems came in third at 21 percent, followed by concerns over development and population growth at 15 percent.

- Puna respondents wanted jobs and they also wanted to preserve the rural nature of their area. Results for several questions indicated enthusiasm for agricultural development (including ag-related light industry) but much more conflict and division of opinion about other forms of economic development.

- Asked to respond to ten different possible forms of economic and physical development, there was more than 90 percent approval for the general (if vague) concept of "more jobs" and for the idea of more diversified agriculture. Ag-related light industries--like fruit drying, hot houses, and aquaculture--was supported by 83 percent, and raising crops to produce ethanol fuel earned 63 percent approval.

- When described as "generating electricity from the volcano's steam," geothermal energy production was judged "good for Puna" by 62 percent of the sample and "bad for Puna" by 21 percent. In Kapoho-Kalapana, the area potentially most affected, the figures were 47 percent in favor and 30 percent opposed.

- Only one-third of the sample supported either heavy industry ("like manganese nodule processing or aluminum refining") or tourism development, and pluralities opposed them. These forms of development were apparently too divergent from the rural values and ideals of most respondents.

- There was sharp disagreement as to whether new jobs must be in agriculture and whether outsiders would get most new jobs anyway. However, 74 percent said new jobs for Puna should be in Puna, not Hilo.

- Keaau residents were the most supportive of economic development proposals, while Kapoho-Kalapana people were the most suspicious. Pahoa respondents were most likely to be concerned about social problems, and the central subdivisions sample expressed the greatest frustration about services and facilities. Kurtistown-to-Volcano respondents tended to react to most of these questions somewhat like Keaau people.

Part III: Opinions on Puna Geothermal Energy and Related Industrial Development

- Most Puna residents have noticed existing geothermal wells, but few have been personally affected by them. Two-thirds of the survey respondents reported having seen a well, but only 18 percent said there had been any impact on themselves or a household member.

- The reported types of impacts were almost entirely of a negative nature. The most common was bad smell (71 percent of those reporting a personal impact), followed by noise (22 percent) and health problems (14 percent).

- Likelihood of having seen a well or having experienced any impact decreases with distance from the Kapoho-Kalapana planning area.

- Roughly half of the respondents said they thought that "using steam wells to make electricity--without any other industrial development" would be a good idea for Puna. A much larger majority supported the sort of agriculture-related light industry which could be aided by geothermal resources (e.g., fruit drying or hot houses), while a distinct minority in Puna thought geothermal-powered heavy industry such as manganese nodule processing would be good for the district.

- Supporters of geothermal electricity development based their position primarily on expectations of cheaper electricity (54 percent) and more jobs (23 percent). By contrast, opponents of electricity development were likely to cite any of a number of environmental objections (30 percent named at least one) or to feel that Puna residents would not get as much benefit from geothermal development as outside parties would.

- Supporters of agriculture-related light industry for Puna were most likely to say their reasons involved economic benefits, especially job creation (37 percent), or job-related social benefits (21 percent mentioned at least one such benefit). The sample base for opponents of such light industry was too small to permit any solid conclusions about their motives.

- Those who supported the idea of heavy industry for Puna did so largely because they believed that it would mean more jobs (74 percent) and/or that Puna residents rather than outsiders would get these jobs (12 percent). Opponents of heavy industry like manganese nodule processing, by contrast, based their feelings largely on various environmental objections (70 percent mentioned at least one such concern). The most frequent of these (42 percent) had to do with concerns about pollution from industrial waste products.

- There was no clear consensus on questions about the best locations in Puna for light or heavy industry. Nor was there solid agreement on which levels of government should be responsible for various aspects of nurturing industrial development.

- A 55 percent majority thought geothermal power is a prerequisite for development of heavy industry in Puna.

- A plurality of Puna residents believes geothermal resources should be the property of whomever holds the title to the land above.

PART I

GENERAL PLANNING AND DEMOGRAPHIC INFORMATION

The first part of this report describes Puna residents' identities, characteristics, and daily lives. This overview will attempt to present a picture of what Puna--and each of the five planning areas in the district--is like.

CHARACTERISTICS OF PUNA RESIDENTS

Population Growth

Perhaps the most striking figures to emerge in Part I are those which illustrate the dynamic recent growth of Puna's population.

Nearly half (47 percent) of the survey respondents had lived in Puna for five years or fewer. Only 21 percent had been there for 20 years or more. Puna's rapid growth rate has already been documented in the 1980 U.S. Census results, which showed a 137 percent increase over the 1970 population figures. The survey results indicate this growth may be continuing into the 1980's, since 21 percent of the sample had moved to Puna in the two years since the last Census. (This should not be used as an indication of actual net population growth since 1980, because the survey did not obtain data on deaths or out-migration.)

Years Lived in Puna District

	percent
fewer than 2 years	21
2 - 5 years	26
6 - 10 years	23
11 - 20 years	8
more than 20 years/"life"	21

Puna "newcomers" (defined as those who had lived there for 20 years or fewer) moved to the district from a wide variety of places, according to the

survey results. Forty percent said they had moved into Puna from elsewhere on the Big Island (principally Hilo), though some of these may have come from off-island before that. Another 28 percent said they had moved from the Mainland (primarily from California and other western states); 22 percent came from Oahu or other Hawaiian islands; and four percent said they had moved here from foreign countries.

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Both survey and 1980 Census results indicate Puna has proportionately more Caucasians and fewer Japanese than the Big Island as a whole. However, the percentage of Caucasians in the sample (46 percent) was still much smaller than the percentage of respondent who had been in Puna for 20 or fewer years (79 percent). This means that Puna residents of many other ethnicities must also be newcomers.

Ethnic Breakdown for Puna vs. Hawaii County

	Hawaii County 1980 Census (all ages)	Puna District 1980 Census (all ages)	Puna District 1982 Survey (adults only)
	%	%	%
Caucasian	34	43	46
Hawaiian/part-Hawaiian	19	15	18
Japanese	27	19	17
Filipino	14	17	10
Chinese	2	1	*
mixed, not Hawaiian**	--	--	5
other	5	4	2

* less than one-half of one percent
** no such category in 1980 Census

- Other Demographic Similarities and Differences

Most of the survey questions covered in Part I of the report were demographic descriptors (age, ethnicity, education, income, etc.). Such items lend themselves both to checking the representativeness of the survey sample and to making comparisons between the Puna population and the Big Island as a whole.

Only partial 1980 Census results are yet available, and so these comparisons must be limited. One possible comparison is for the proportion of people in various age categories. The 1982 survey and the 1980 Census figures indicate little difference between the Puna age structure and that for the Big Island as a whole, but ethnic structure is very different in Puna than for the rest of the island. Only a few other comparisons were possible to check representativeness. The average household size for the 1982 Puna sample (3.27 persons) was larger than the 1980 Census figure for the district (3.07); this is a typical failing of household sample surveys because it is more difficult to find someone at home if only one or two people live in the house. The survey sample consisted of 22 percent renters and 78 percent homeowners, while the 1980 Census showed 26 percent renters and 74 percent homeowners for Puna.

A comparison with Hawaii State Department of Health Surveillance Survey data suggests that median income in Puna may be slightly less than for the Big Island as a whole. However, unemployment among household heads in the 1982 survey was at the same rate--eight percent--as the total Big Island 1981 unemployment figure.

In addition to the unemployed eight percent, 23 percent of the heads of sampled Puna households were retired. No islandwide comparison figures are yet available.

- Labor Force Composition

The survey results show working household heads in Puna were engaged in a wide variety of occupations and industries. The most frequently reported occupations and industries among the survey respondents were as follows:

Most Frequent Occupations and Industries
for Puna Household Heads

Occupation	percent
professional/technical/managerial	13
structural work	10
self-employed	8
farming/fishing/forestry	7
clerical/sales	7
miscellaneous (including laborers)	7
Industry	**percent**
agriculture	20
--sugar	-- 7
--other	--13
construction	12
government work	8

The foregoing percentages are based on the total sample, including retirees and the nonemployed. If retirees, nonworkers, and nonresponses are excluded, the importance of the agricultural industry becomes more apparent. Fully 30 percent of the working heads of households were employed in agriculture--11 percent in sugar and 19 percent in "other agriculture."

Looking at total household employment (not just household heads), 26 percent of the sampled households had no full- or part-time employed persons; one-third of the households contained a single employee; another third contained two full- or paret-time working people; and fewer than ten percent had three or more employed household members. The Puna-wide average was 1.25 employed persons per household.

- Travel In and Out of Puna

Rural households often require multiple cars, and this proved the case in Puna. Nearly two-thirds of the sampled households had two or more operative cars or trucks. Only three percent had none. Such working vehicles are particularly crucial in Puna. The data show a substantial part of the Puna work force traveled outside the district to work, and most people went to Hilo to shop.

Major Work Places and Shopping Sites

	work place for household's chief wage earner		shopping
	percentages based on total sample (including non-workers, off-island workers, etc.)	percentages based only on workers traveling outside home to a fixed-location Big Island job	percentages of respondents who "usually" shopped in certain areas
Puna	32	47	20
Hilo	27	41	72
other Big Island (not Puna)	8	12	--
base:	(778)	(516)	(778)

Of those who said they do their usual shopping in Puna, roughly 90 percent said it was done in Keaau. Asked which Puna community "needs more stores and businesses the most," a plurality named Keaau (35 percent), followed by Pahoa (23 percent). People living closer to Keeau tended to name that town, while people in or makai of Pahoa were more likely to name Pahoa.

Twenty-five percent of the respondents said no new stores and businesses are needed. And on the question asking for Puna's "most important problems," only two percent of the sample cited the current lack of stores and businesses. Thus, it appears that most Puna residents were accustomed to the long treks for shopping and/or to combining shopping trips with work trips to the Hilo area.

- Community Commitment, Involvement, and Identity

The foregoing figures show a great many Puna respondents worked and shopped outside the district. This may naturally lead to questions about the extent to

which Puna residents feel a commitment to, or identification, with their communities. Other survey questions can shed some light on this issue.

First, respondents were asked the likelihood of moving out of Puna in the next five years. If they said they might leave, they were asked why. We found that most Puna residents are committed to continued residence in their district. Fully 80 percent of the survey respondents said they would probably or definitely stay; ten percent said they would probably or definitely move; and ten percent were not sure. Among those few who indicated any possibility of moving (including the "not sure" people), no clear single motive emerged. Economic and personal reasons--the usual motives for people leaving their homes--had a slight edge.

(It should also be noted that very few people mentioned geothermal development as a reason for a potential move out of Puna. Only five individuals in the sample of 778 said that present or feared future impacts of geothermal development might cause them to move away from Puna.)

Another indicator of community commitment is participation in public meetings which deal with community planning issues. Asked if they had attended any such meetings in the past three months, ten percent of the respondents said they had personally done so, and another three percent said said they had not but someone else in their household had. There are no baseline islandwide figures for comparison, but it seems unlikely that many other parts of Hawaii County have someone from 13 percent of the area households turning out for such meetings.

These figures indicate fairly strong resident involvement with, and commitment to, Puna as a whole. Within Puna, however, a separate question involves the extent to which subdivision residents identify with established towns vs.

data for the individual planning areas, we should be aware that estimated sample precision decreases as sample size decreases. For the whole Puna survey, the estimated sample error is about 3.2 percentage points. For the two smallest planning areas--Keaau and Kapoho-Kalapana--the estimated sample error is closer to ten percentage points. Thus, relatively small diferrences in percentages across areas may not indicate meaningful differences in the findings. In many ways, Keaau and Kapoho-Kalapana turned out to have the most distinctive profiles. Some of that uniqueness may be due to sample error. On the other hand, most of the findings for these two areas seem to mesh reasonably well with practical experience and other evidence regarding the communities.

According to the majority of the characteristics covered by this study, the five planning areas are more alike than they are different. There is evidence here for considering the Puna District residents to be a relatively homogenous group. Some unique area characteristics were observed, however, and these should be useful to planning efforts.

Residents of the two planning areas in upper Puna (Keeau and Kurtistown-to-Volcano) had similar demographic profiles. Those profiles were somewhat different from the demographic profiles of the residents of what we call lower Puna --the central subdivisions, Pahoa, and Kapoho-Kalapana. Lower Puna had had greater population growth than upper Puna. The survey found nearly three-quarters of Puna's newcomers (20 years or less) were living in lower Puna, while about 60 percent of the longtime residents were in upper Puna. All of Puna has proportionately more Caucasians and fewer Japanese than does the rest of the island, but this was even more the case in lower Puna than in upper Puna. Residents of lower Puna subdivisions were more likely to give the name of their subdivision, rather than of the nearest town, when asked where they lived. All of Puna is changing, but it is changing more rapidly in lower Puna.

the extent to which they identify only with their own subdivisions. This was indirectly measured through the survey's opening question: "What part of Puna do you live in?" Interviewers noted whether the respondent answered with the name of a town or the name of a subdivision. For those who named a town, a follow-up question established whether the respondent really lived in a nearby subdivision. The figures below show that more than half the sample's subdivision residents initially named their subdivision rather than a town. It appears that most subdivision residents may not identify with nearby communities.

Identification of Subdivisions Residents

Planning Area	(1) number in total sample	(2) number actually in subdivision	(3) number initially saying they lived in subdivision	percent of subdivision residents identifying with the subdivisions ((3)/(2))
1 Kapoho-Kalapana	60	36	17	47%
2 Pahoa area	258	211	110	52%
3 Central subdivisions	204	204	128	61%
4 Keaau	76	0	0	--
5 Kurtistown to Volcano	180	20	6	30%
TOTAL SAMPLE	778	471	261	55%

- Unique Characteristics Of Planning Areas

Figure 1 at the beginning of this report shows the boundaries of the five planning areas into which Puna was divided for this survey. In dealing with

Some important differences emerged even within these two broad groupings.

In upper Puna, Keaau differed from the Kurtistown-to-Volcano region by having proportionately more Filipinos; far more people employed in agricultural industries, particularly sugar; a lower median income (the Kurtistown-to-Volcano area had the highest median income in Puna, while Keaau's was lowest); a much higher average household size; a lower overall educational level; and more newcomers from foreign countries. Though closer to Hilo, Keaau residents were less likely than respondents from any other planning area either to work or to shop there.

In lower Puna, the Pahoa planning area differed from the other two areas in having proportionately more longtime residents, fewer Caucasians, and more Japanese (although not to the same extent as in upper Puna); in having a larger average household size and proportionately more school-aged children in these households; and in having a higher unemployment rate, lower median household income, and slightly lower overall level of education. Recall that relatively few residents of the Pahoa planning area actually live in the town of Pahoa.

The central subdivisions planning area was most unique in that the respondents consisted almost entirely (95 percent) of people who had been in Puna for 20 years or fewer. This area also had the smallest percentage of household heads working in agriculture; the smallest average household size; and the highest home ownership rate in the Puna sample. However, median income was about equal to the Puna norm, and the percentage of household heads who were self-employed or in professional/managerial jobs was on the high side, but not so high as in Kapoho-Kalapana.

Kapoho-Kalapana respondents were like the total Puna sample in many ways, but perhaps a little more affluent on average. They had a slightly higher

median income than other areas, proportionately more college-educated residents, and greater percentages of household heads who were self-employed or in professional/managerial occupations. On the other hand, this area also reported the greatest percentage of rental households (33 percent). Kapoho-Kalapana were perhaps most unique in their level of attendance at planning-related community meetings--27 percent said either they or another household member had attended such a meeting recently, a figure twice as high as that reported by any other planning area. And along with the Kurtistown-to-Volcano area, Kapoho-Kalapana contained the largest percentage (86 percent) of residents saying they would probably or definitely remain in Puna for the next five years.

PART II

GENERAL OPINIONS ON PUNA'S CURRENT AND FUTURE SITUATION

(Context for Attitudes on Geothermal Development)

Five questions (some of them multi-part) were posed early in the survey to get general views on (1) best and (2) worst things about life in Puna today; (3) attitudes on a list of ten possible physical and economic development activities (including geothermal and some potentially related industrialization); (4) beliefs about various aspects of future Puna jobs; and (5) expected amount of change in Puna over the next five years. Because these questions were all asked before the questions focusing only on geothermal development, they provide a crucial context for understanding Puna residents' attitudes toward geothermal development. Part II results are valuable for more general Puna community development planning in the near future.

PUNA RESIDENTS' ATTITUDES

Asked to name the best things about life in Puna today, respondents cited a great variety of factors, which were collapsed into several broad categories.

Best Features of Life in Puna

	percent
Population/Development (generally lack of such features e.g., country atmosphere, rural area, uncrowded, etc.)	49
Other Physical/Environmental (climate, beauty, etc.)	40
Social/Lifestyle Factors	33
Personal Associations/Commitments	19
Economic Attributes (cheap housing, land, prices, etc.)	11
Location/Convenience Factors (close to Hilo, work, ocean, etc.)	11

NOTE: Percentages can sum to more than 100 percent because of multiple responses.

Nearly half the respondents expressed appreciation for some aspect of Puna's undeveloped, unpopulated rural nature. The 49 percent figure does include one percent who were enthusiastic about the development and population growth occuring in Puna.

The next most frequent general type of reply was somewhat similar, involving a number of comments about physical/environmental aspects (most often "climate," but also "scenic beauty," "lack of pollution," etc.). References to positive lifestyle factors in Puna placed third, although the specific comments within this general category were sometimes contradictory in tone--e.g., 13 percent of the respondents said they valued the people or the "community feeling" in Puna, while another ten percent appreciated the sense of privacy and absence of "hassles" in the area.

Relatively few respondents made reference to Puna's low housing costs or other desirable economic attributes. A few commented on convenience to Hilo, jobs, etc. It is possible that a good many people originally moved to Puna in order to find an inexpensive home from which to commute to a Hilo job, but any such motives were not strong factors in their current feelings about the "best things" in Puna.

Finally, virtually nobody specified the excitement of watching geothermal energy development as one of the "best things" about life in Puna.

Puna's "most important problems" were also notable in terms of the number and diversity of complaints made by residents. However, the original comments were boiled down to the broad categories shown in the chart on the following page.

Most Important Problems in Puna

	percent
Economic problems	44
--Puna Sugar Closing	--23
--Other Economic Problems (lack of jobs, etc.)	--26
Problems with Services and Facilities (roads, water, police, etc.)	27
Social Problems (crime, poor education, etc.)	21
Development problems	26
--Overpopulation/Development (not specifically relating to geothermal)	--15
--Geothermal Development	--11
Physical/Environmental Problems (climate, etc.)	3

NOTE: Percentages can sum to more than 100 percent because of multiple responses. Puna sugar closing and other economic problems do not sum to the total for Economic Problems for the same reason.

Taken together, references to either the announced Puna Sugar plantation closing or to other economic problems (primarily lack of jobs in Puna) constituted the most frequently mentioned type of problem. Problems with services and facilities (primarily roads, water, and police) formed the next most frequent general category of complaint.

If problems relating to geothermal development (current or future) are considered a special case of more general concerns about development and population

growth, then the combined population/development/geothermal category would place so closely behind "problems with services and facilities" that these two would be tied for second place in the rankings of important Puna problems. However, it is appropriate for purposes of this report to note the low numbers (11 percent) of Puna respondents who made any reference to geothermal development as being among Puna's most important problems.

When comparing Puna respondents' answers to the questions about the "best things" and the "most important problems" for Puna, it is apparent that the people of Puna are facing the classic dilemma of rural residents: Part of what they most love about their homeland--the relative lack of development and population--is closely tied to their major source of regret and unhappiness about the area--lack of jobs and lack of the sort of facilities and services which would be justified by a larger tax base and larger population.

Although the survey did not contain any direct trade-off questions, some clues about Puna residents' values (and their essential conflict) can be found in their ranking of ten different prospective economic or physical development proposals as to whether they are "good" or "bad for the people of Puna." These are shown in the next chart.

These figures indicate that Puna residents would like to solve their economic problems without impairing the valued rural character of the district. And to do this, agricultural-related development appears to be an ideal solution. Each item on the list of possible development ideas (with the exception of the leader, the highly valued but vague "more jobs") has progressively less of an agricultural component and also progressively less support among Puna residents.

All of these items but two--tourism and heavy industry development--won the support of a majority of Puna respondents. The general picture is that some

compromise with rural values would be acceptable to most Puna residents in order to improve the economy and the facilities in the area, but many people at the time of this survey would draw the line at major tourism or heavy industry development in Puna.

Approval of Different Types of Proposed Development in Puna

Proposed Development	percent saying "good for Puna"
new jobs for Puna	93
more diversified agriculture	91
light industry (like fruit drying, hot houses, aquaculture)	83
improve current roads; build more	78
build new parks	64
use sugar or scrub trees for ethanol production	63
generating electricity from volcano's steam	62
more housing	55
resort areas, tourism	34
major industry like manganese nodule processing plant	33

The foregoing list provides a particularly important context for grasping Puna residents' attitudes toward geothermal development. Note that the word "geothermal" was not used in the crucial item. Rather, the phrase "generating electricity from the volcano's steam" was employed. With these words and in this context, geothermal energy development was supported by 62 percent of the

Puna sample. (As will be discussed in Part III, when question wording and context are somewhat different, results are also somewhat different.) Even greater majorities endorsed two agricultural-related light industries which might be stimulated by availability of geothermal resources-ag-related light industries (83 percent) and ethanol production (63 percent).

On the other hand, geothermal power might also lead to the creation of heavy industry, such as manganese nodule processing or aluminum refining, in Puna. This prospect was far less popular.

More light is shed on the values and concerns of Puna respondents in their reactions to the following statements about new jobs in Puna.

Beliefs About New Jobs in Puna

	agree	disagree	don't know
	%	%	%
Most of the jobs created by new business and industry will go to people from outside the Puna area.	44	45	11
All the new jobs would have to be in agriculture if they are meant to help Puna residents.	45	50	5
I'd rather have the jobs in Hilo or someplace other than Puna.	15	74	11

Again, the numbers illustrate strong community conflicts and ambivalence regarding economic development in the area. Half of those with an opinion believed that most employment benefits in the future will go to outsiders. A

substantial minority said that new jobs must be in agriculture. The only consensus was that jobs should go in Puna, not Hilo. It is clear that most Puna respondents were not against economic development, but many were unwilling to see development of any but a rural/agricultural nature.

The final survey item covered in this part of the report was a question about whether the respondents expected Puna to change "a lot," "a little bit," or "stay just about the same" over the next five years. Results were: "a lot," 48 percent; "a little bit," 32 percent; "stay about the same," 13 percent; no opinion, seven percent. These figures are subject to several different interpretations. On the one hand, 80 percent expected Puna to undergo at least some change. On the other hand, nearly half the sample thought Puna would change only a little or not at all.

UNIQUE CHARACTERISTICS OF PLANNING AREAS

In general, the greatest divergence among attitudinal responses to Part II questions was found between the Keaau and Kapoho-Kalapana planning areas. Keaau residents were the most concerned with getting economic development while Kapoho-Kalapana respondents were the most suspicious of it. This is understandable, since Keaau is facing the greatest economic disruption in Puna if the plantation closes as scheduled, while Kapoho-Kalapana's current rural character would be most affected by various proposed activities such as expanded geothermal power development, mangangese nodule processing, and/or resort construction. The differing demographic profiles of the two areas could also dispose residents toward different attitudes and aspirations. Keaau's dependence on agricultural enterprise and already low per capita incomes are consistent with the town's concern over agricultural development.

The Kapoho-Kalapana respondents produced the smallest percentage of all the Puna planning areas to favor "generating electricity from the volcano's steam" (47 percent) and the largest percentage to say it would actually be "bad for the people of Puna" (30 percent). Residents in this part of Puna were less likely to endorse any of the proposed forms of economic development, except for diversified agriculture and ag-related light industries like fruit drying or hot houses. For the most part, Puna respondents did not label the various proposals as "bad" (instead saying "no difference" or "no opinion" when they didn't say "good"). Kapoho-Kalapana and central subdivisions residents, however, had majorities saying both tourism and manganese nodule processing would be "bad for the people of Puna."

After Kalapana-Kapoho, Pahoa planning area residents live nearest to the proposed geothermal power and manganese nodule processing area, but they were no more likely than other Puna folks to name geothermal as one of Puna's most important problems. Their pattern of support/opposition for "generating electricity from the volcano's steam" was about the same as the rest of the sample. Pahoa respondents were least likely (after Kapoho-Kalapana) to refer to the Puna Sugar shutdown as among Puna's major problems (just 16 percent), but most likely (30 percent) to voice concern over social problems such as crime and poor education.

Central subdivisions respondents were a bit more likely to endorse geothermal development and were the most likely to complain about lack of services and utilities. Otherwise, their responses to these Part II questions were similar to those of the Puna sample in general and the Pahoa and Kapoho-Kalapana respondents in particular.

The Kurtistown-to-Volcano respondents tended to answer these questions more like Keaau residents than like the respondents in lower Puna. But the Keaau profile was much more distinctive. These respondents were much more likely than the Puna sample as a whole to cite the Puna Sugar closing as a major problem (46 percent vs. 23 percent); to refer to personal roots or convenience to either work or Hilo as being the best things about Puna; to favor even heavy industry or tourism development (though still by less than a majority); and to <u>disagree</u> with the contention that most new jobs will go to outsiders.

PART III

OPINIONS ON GEOTHERMAL DEVELOPMENT AND GEOTHERMAL-POWERED INDUSTRY IN PUNA

The final attitude questions on the survey dealt with development of geothermal electrical energy and some industries which might utilize that power to economic advantage. These questions involved (1) perceptions of past and present geothermal activities; (2) reactions to several different possible scenarios for future geothermal-related development in Puna; (3) various policy issues.

PUNA RESIDENTS' ATTITUDES

Perceptions of Present Geothermal Activities

Two out of three respondents (67 percent) said they had seen at least one of the existing geothermal wells, which are all in the Kapoho-Kalapana area. About one out of five respondents (18 percent) said they or some other household member had been affected by these wells.

Those who claimed some impact were asked to describe what effect or effects had been experienced. The great majority of respondents--84 percent--replied with at least one negative impact. The most frequently reported effect was bad smell (71 percent), followed by noise (22 percent) and health problems (14 percent). These percentages add to more than the total 84 percent negative because respondents could give more than one reply.

Only eight percent of those who said they had been affected mentioned any positive effect--primarily anticipated economic benefits of some type.

Likelihood of various responses was strongly related to distance from the current Kapoho-Kalapana geothermal activity.

Percent of Puna Residents Affected by Geothermal Wells
(By Phoning Areas)

percent who said..	Area 1 Kapoho-Kalapana	Area 2 Pahoa	Area 3 Subdi-visions	Area 4 Keaau	Area 5 K'town-Volcano	total
	%	%	%	%	%	%
they had seen existing geothermal wells	85	76	67	54	52	67
they or household member had been affected by wells	43	28	14	4	6	18
(of those affected), that impacts were of negative nature	100	88	74	50	67	84
--smell	--81	--79	--58	--50	--42	--71
--noise	--38	--22	--16	-- 0	-- 8	--22
--health problems	--38	-- 8	--13	-- 0	-- 8	--14

The fact that Kalapana-Kapoho respondents were more likely to report impacts in various categories was partially because they gave more answers overall to this question (average 2.15 replies from affected Area 1 respondents vs. average 1.59 for the sample as a whole). However, it should also be noted that sample bases in each planning area were very small for the question about types of impacts, because this question was only posed to the few respondents who reported having experienced any impacts. Therefore, results for each planning area should be regarded with some caution.

- Reactions to Various Geothermal-Related Development Scenarios

Three different scenarios for the development and use of geothermal energy in Puna were presented, in this order: (1) "using steam wells to make electricity--without any other industrial development;" (2) "using hot water or steam to run industries like fruit drying, hot houses or shrimp farming;" and

(3) "heavy industry like manganese nodules or aluminum refining." The wording of these items was chosen carefully and after pretesting the first draft.

For each scenario, respondents were asked whether they thought this would be good for Puna or not. The response "it depends how it's done" was not presented as an option, but it was anticipated that it would be a fairly frequent reply, so interviewers were trained to record it. Respondents who answered "good" were then asked to explain the expected benefits for Puna. People who said a geothermal-related scenario was "not good" were asked to explain their objections in terms of expected problems for Puna. Those who said "it depends" were asked to outline exactly what their future opinions would depend on.

The results for the three different scenarios are presented in the following table.

Evaluations of Different Geothermal-Related Development Scenarios

	electricity only--no industry	light industry	heavy industry
	%	%	%
good idea	48 (53)*	66	21
not good idea	22 (17)*	8	44
depends how it's done	12	9	10
no opinion	18	18	25

* Five percent of the sample opposed geothermal electricity generation (no industrialization) because they thought there should be industrial use of geothermal power in Puna. The figures in parentheses include those responses.

The three scenarios for geothermal development were very similar to three items which had already been asked among the list of ten different economic or

physical developments proposed for Puna (see Part II). The differences in wording and position may be important to planners, and is reflected in the chart below.

Comparison of Responses to Three Geothermal Development Options
In Two Different Question Formats

Option A		Option B	
As part of a general list of possible development activities		As direct evaluation of alternatives for geothermal development in Puna	
"...generating electricity from the volcano's steam"		"...using steam wells to make electricity--without any other industrial development"	
response	percent	percent	response
good	62	53*	good
bad	21	17*	not good
no difference	3	12	depends
no response	14	18	no response
"...some light industry, like fruit drying, hot houses, or aquaculture"		"...using hot water or steam to run industries like fruit drying, hot houses, or shrimp farming"	
response	percent	percent	response
good	83	66	good
bad	8	8	not good
no difference	4	9	depends
no response	6	18	no response
"...get a major industry in Puna, like manga-nodule processing or aluminum refining"		"...heavy industry like manganese nodules or aluminum refining"	
response	percent	percent	response
good	33	21	good
bad	47	44	not good
no difference	2	10	depends
no response	18	25	no response

* Includes five percent of the sample which opposed geothermal development items because they felt industrialization was a necessary part of it.

In each of the three comparisons, the percent responding negatively remained stable. The percent responding in favor of the idea decreased in Part III, and the percent responding with some uncertainty or not responding at all increased. These parallel changes in wording were done by design, and provide some valuable insight of the public reaction to the complex problems involved in geothermal development.

In Part II, we asked about the three geothermal development scenarios within a list of items that might be involved in planning for Puna's future. The atmosphere set by previous questions was revealed to be one in which people saw Puna as their home, and a very desirable place to live. They also see the major problem in the area to be its perceived declining economy. They told us about Puna sugar's closing, the lack of jobs, and some unemployment. Their responses to a general list of items which might be "good for Puna" tell us that they are willing to consider most of them if it means a promise of economic welfare in the relatively near future. In fact, the negative response to heavy industrial development in Part II might be considered to be an indication of relatively strong public sentiment against the idea.

In Part III, we asked our respondents some relatively complex questions about the three geothermal development scenarios. They were preceded by some general questions on geothermal and the advantages and disadvantages of the development process. The result was that more people either qualified their answers or were unable to respond at all. This is evidence that (1) even backers of geothermal development have concerns about the way the development is managed, and (2) the complexity of the geothermal development process may not be fully understood by all residents.

The important fact is that by either measure, a majority of Puna residents were favorably disposed to the production of electricity from steam in Puna, and also to the agriculture-related light industrial development which might be powered by that electricity. A minority of the residents were favorably disposed to the idea of heavy industrial development in the area, and the plurality were against the idea.

Between 27 and 35 percent of the residents were uncertain or uncommitted about the development scenarios. Certainly, the types of concerns and objections held by this latter group will be important to those responsible for planning the future development of one of Puna's most valuable natural resources.

The survey also provided information on the specific aspects of geothermal development which concern Puna residents. The responses were coded into similar categories and are summarized in the next three tables. The tables present figures for general headings with some important subcategories. If a respondent gave any of the three replies--"good idea," "not good," "it depends"--for a scenario, he was then asked to explain his answer further.

The figures in the following table represent the benefits perceived by the supporters of each scenario. The primary reason for Puna respondents' support of geothermal electricity production was the expectation that it would result in lower electricity rates for local residents. Despite the generally accepted idea that a geothermal power plant would not be labor-intensive, the second most common reason for feeling that geothermal electricity production would be "good for Puna" was that it would create new jobs.

Selected Reasons for Thinking Each Geothermal Scenario "Good For Puna"

	electricity only--no industry %	light industry %	heavy industry %
Costs/Quality of Electric Service	58	13	0
--cheaper electricity	--54	--12	-- 0
Other Economic Benefits	31	52	78
--more jobs	--23	--37	--74
Physical/Environmental Benefits (e.g., energy self-sufficiency, nonpolluting energy, etc.)	19	19	2
Population/Development Benefits (e.g., desired growth)	1	2	2
Other Social Benefits	4	21	15
--jobs for Puna (vs. outsiders)	-- 3	--12	--15
Services/Facilities (e.g., stimulation of desired amenities)	*	1	0
base:	(370)	(511)	(165)

* Less than one-half of one percent

For the supporters of the agriculture-related light industry scenario, the primary emphasis shifted to job creation and the expectation that these jobs would go to Puna residents, not outsiders. For the heavy industry scenario, the emphasis was overwhelmingly (74 percent) on job creation. Environmental rationales played a tertiary role in support for the first two scenarios, but virtually drop out of the list of reasons for heavy industry.

If a respondent said that a scenario would not be good for Puna, he or she was asked to explain why that was so. The following table presents the results of that further inquiry.

Selected Reasons for Thinking Each Geothermal Scenario "Not Good For Puna"

	electricity only--no industry %	light industry %	heavy industry %
Costs/Quality of Electric Service	23	17	2
--electricity won't be cheaper in Puna	-- 9	-- 7	-- 0
--benefits to others, not Puna residents	--16	--10	-- 2
Other Economic Objections	29	7	4
--want more industrialization than scenario provides	--22	-- 0	-- 0
Physical/Environmental Problems	30	19	70
--odor	--11	-- 3	-- 1
--geothermal air pollution	-- 9	-- 7	-- 1
--heavy industry waste/pollution of air, water	-- 2	-- 2	--42
Population/Development Problems	5	7	15
Other Social Problems	11	12	10
Services/Facilities (e.g., inadequate infrastructure)	0	2	2
General Comments (e.g., "just don't like it" or "Puna will change for the worse")	12	39	15
base:	(175)	(59)	(343)

Environmental considerations play a major role in the motives of opponents of geothermal electricity generation, and are clearly center stage for opponents of heavy industry. Seventy percent of heavy industry opponents mentioned at least one environmental objection. Most often (42 percent) is was the fear of pollution from heavy industrial waste products. Thus, the heavy industry scenario neatly divides Puna residents along an environment-vs.-economy value cleavage, with environmental values winning in this context.

For the geothermal electricity generation scenario (no industrialization), supporters and opponents had the same kinds of reasons for their positions. An important exception to this rule was the fact that one group of opponents felt that electricity generation was useless without the development of light industry. These respondents were actually supporters of geothermal development in Puna. If we exclude them from the analysis, then the major objections to the electricity generation scenario are: (1) perceived danger to the environment, and (2) distrust of claimed benefits to be derived from the generation of electricity. Specifically, the opponents felt that electricity rates would not go down, that the major economic benefits of the proposal would go to HELCO or to energy consumers outside the district, and/or that the new jobs would go wholly or disproportionately to persons outside of Puna.

The same pattern holds true for the light industrial development scenario. Most opponents were concerned with its impact on the environment, or did not believe that the economic benefits would accrue to Puna residents. The sample size for the opponents is relatively small since most residents favored the scenario.

Finally, if the respondents said "it depends" as an answer to one of the three goethermal scenarios, we probed further to find out just what it depended on. These responses appear in the table on the following page.

What Future Opinions Depend On, According To Those Who Said "It Depends"

	electricity only--no industry %	light industry %	heavy industry %
Costs/Quality of Electric Service	53	23	5
--if Puna gets lower rates	--24	-- 4	-- 0
--if benefits Puna, not others	--22	-- 8	-- 5
--electricity for Puna/Big Isle only	--12	-- 8	-- 0
Other Economic Conditions	23	28	59
Physical/Environmental Conditions	23	28	59
--if pollution problems solved	--13	-- 0	--28
--if doesn't harm land, environment	--10	--10	--18
Population/Development Conditions	5	3	9
Other Social Conditions	12	18	24
--if locals get jobs	-- 8	-- 4	--18
Services/Facilities	0	0	1
Location Conditions (e.g., "if away from people")	6	4	18
General Comments	20	15	16
--if good plan/research/controls	--15	--11	--12
base:	(91)	(71)	(74)

The pattern of concern for the uncertain respondents is more similar to those of the opponents of geothermal development than that of the proponents. They too are concerned about its effects on the environment, the fact that the jobs created might not go to Puna residents, and the idea that the economic benefits of geothermal electricity and industrial development might be siphoned off to Hilo, Oahu, or the mainland.

In summary, proponents of geothermal development in Puna see it as beneficial because it can bring them lower electric bills, more jobs for them and

that this can be done without danger to the environment. In fact, they see geothermal electricity as less polluting than burning oil. The opponents of geothermal development in Puna are against it because it will damage the environment, and because the purported economic benefits will either not materialize or will not accrue to Puna people. Those who are not sure, echo those same concerns. The difference is that the opponents' reasons are strong enough to cause them to resist plans for geothermal development. Planners should keep in mind that the success of geothermal development plans will hinge on these basic concerns.

- Geothermal-Related Policy Questions

The survey concluded with a number of questions relevant to geothermal development policy. The first two of these asked where light industry and heavy industry should be located if they do come to Puna.

Opinions on Where Industries Should Be Located in Puna

	Light Industry (like fruit drying or hot houses) %	Heavy Industry (like manganese nodule processing) %
Area 1--(Kapoho-Kalapana)	17	10
Area 2--(Pahoa or north)	10	3
Area 3--(central subdivisions)	5	1
Area 4--(Keaau/Puna sugar lands)	10	6
Area 5--(Kurtistown-to-Volcano)	2	3
Responses in Terms of Site Characteristics (e.g., "away from people")	16	17
Negative Responses (nowhere)	3	19
General Comments	8	2
Nonresponses	29	39
base:	(778)	(778)

The results do not give a clear sense of direction for planning. Many respondents failed to give a geographically specific answer. Among those who did specify a location, no clear consensus on sites is provided.

Another question asked if survey respondents thought it possible to "have heavy industry in Puna without using the steam to make electricity, or do you think that geothermal electricity would have to come first?" A majority (55 percent) said geothermal would have to come first; about one-quarter gave no opinion, and only 18 percent thought heavy industry could be developed without benefit of geothermal energy. This means that a majority of Puna residents see geothermal energy as a necessary precondition for something that only a minority of them want to see happen (i.e., heavy industry). It does not, however, necessarily imply that Puna respondents feel geothermal electricity will inevitably lead to heavy industry in Puna.

Respondents were then asked whether they thought industry or government should be responsible for three aspects of industrial development in Puna: (1) "planning industry so that it helps Puna;" (2) "helping to pay for the cost of building the industry;" and (3) "watching over industry to be sure it complies with all the rules." If the respondent said "government" should be responsible, he was asked which level of government--county, state, or federal.

Opinions on Who Is Responsible for
Different Aspects of Industrial Development

	planning to benefit Puna	paying development costs	monitoring industry
industry itself	26	44	10
federal government	5	14	14
state government	11	8	17
county government	16	4	14
other responses	32	20	34
don't know	10	10	11

These figures give some sense of which task Puna residents are most likely to feel is the proper sphere of private industry--i.e., money, not planning or self-monitoring--but once more they show no clear consensus on the key policy question: Which level of government should have primary responsibility? To a very slight extent, there are some tiny "pluralities" to be considered. Looking only at the percentages for the three levels of government, more people name the county government for the planning function; the federal government, for subsidizing development costs; and the state government, for monitoring industry compliance with rules.

The last question involved respondents' opinions on the issue as to who is the "real owner of geothermal resources." Respondents were presented with four options, in randomized order, and were also permitted to name some other owner or to give no opinion. Results are shown on the following page.

Opinions on "Real Owner" of Geothermal Resources

	percent
whoever holds legal title to the land above	48
the State government	13
the native Hawaiian people	10
the County government	6
others	9
no opinion	14

To our knowledge, this is the first time this question has been placed before the public. While the issue is likely to be decided in the courts, it is interesting to note the current state of public opinion in Puna.

. Geographical Differences in Attitudes

For the items covered in Part III, there were very few differences among planning areas. Those that did appear fell into one of two related patterns: (1) rough correlation with distance from the current geothermal activity in the Kapoho-Kalapana area, or (2) a pattern in which Kapoho-Kalapana tended to have the highest (or lowest) percentage responses on items for which Keaau respondents inversely had the lowest (or highest) percentage responses.

The pattern involving correlation with distance from Kapoho-Kalapana was illustrated for perceptions of present geothermal activities. The closer the respondent was to Kapoho, the greater the choice of having seen a geothermal well, of being impacted by it, and of having a negative reaction to it.

On a number of other questions, Keaau and Kapoho-Kalapana respondents tended to be at opposite ends of a spectrum. Keaau respondents were most likely to say heavy industry would be a good idea for Puna (30 percent), while Kapoho-Kalapana

residents were least likely to agree (12 percent). On the other hand, Kapoho-Kalapana residents were most likely to say agriculture-related light industry was good for Puna (77 percent) and Keaau residents were least likely (55 percent). Keaau residents were not more likely to oppose light industry. Rather, they were more inclined to be uncertain about it. In explaining their support for, or opposition to, different scenarios, Kapoho-Kalapana residents were most likely to use social or environmental reasons pro or con, while Keaau residents were most likely to refer to economic rationales.

These observations are consonant with those in Parts I and II which often find Keaau and Kapoho-Kalapana having divergent response patterns, particularly those in regard to Keaau's greater concerns with economic development. The survey data do not explain Keaau residents' occasional hesitation over agriculture-related light industry, but perhaps the examples given--fruit drying, aquaculture, etc.--have represented forms of agriculture less familiar in Keaau than plantation crops.