

PARKS, POPULATION, AND RESETTLEMENT IN THE DOMINICAN REPUBLIC

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ABSTRACT

A survey of 139 men and 123 women in four communities bordering Los Haitises National Park in the Dominican Republic took place in late 1992. The survey followed a presidential decree ordering

the army to clear the forest of people and cattle and to resettle

a number of villages. The survey found that people admitted using the forest for firewood and cash crop cultivation. However, they were aware of the need to conserve the forest and expressed willingness to compromise on its use. They were less aware of park boundaries and did not understand the concept of a national park. Villagers welcomed rapid population growth, and women favor (and have) large families despite high rates of sterilization. Nearly everyone opposed resettlement and favored community participation in programs to reduce pressures on the park. In addition to providing housing and services, a resettlement program will have to find adequate substitutes for current park activities that provide cash income. Of a battery of social indicators such as gender, age, or socio-economic status, few showed much relationship to park use or attitudes toward conservation, the exception being community and religion.

Key Words: Attitudes, Behavior, Gender, Knowledge, Park, Population, Resettlement, Survey

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INTRODUCTION

"Detailed knowledge of the people whose lives are affected by the creation and management of parks is as important as that of the plant and animal species to be conserved (World Conservation Union 1992: unpagged)."

"Study of the agricultural colonists who are the primary agents of deforestation in frontier regions is still at an incipient stage (Pichon 1992: 663)."

According to Wells and others (1992: 1), "Many of the most important protected areas are experiencing serious and increasing degradation." Among the most frequently-cited causes are population increase and poverty [note 1]. Population growth in such areas is mostly due to natural increase, often worsened by in-migration. Poverty has many causes and interacts with population in various ways [note 2].

Governments seeking solutions to the deterioration of protected areas can use force to "seal off" the park while ignoring the root causes of the problem. Or they can directly attack the deeper problems of population and poverty. A common attack on poverty tries to create more attractive employment alternatives outside the park or more favorable activities within it.

Probably the best of such efforts fall in the class of integrated conservation-development projects (ICDPs). Governments can address population pressures directly through resettlement programs and migration incentives. Or, in the longer range, they can reduce natural population increase through fertility reduction programs.

These solutions have at least two things in common. First, none has had much success [note 3]. Second, few projects have been preceded by "careful social analysis and participatory planning..." (West and Brechin 1991: 369). Does this research gap help account for the failure of such programs? What difference would social science data on the population make?

This paper strives to show the kinds of information obtained from a small social survey that might benefit policymakers and the concerned population near a threatened national park. The survey took place in 1992 in four communities adjacent to Los Haitises National Park in the Dominican Republic. It tried to answer these questions:

1. How clearly does the population near the park understand the park boundaries and restrictions the government imposes within it?
2. How much "conservation wisdom" does this population have?
3. How dependent are villagers on park resources?
4. How do villagers feel about resettlement and why?
5. How do they feel about population increase and fertility regulation?
6. How do these matters differ among villages and among residents within villages?

Such information might help a program decide how much and what kinds of education it needs.

It could also clarify how villagers might react to resettlement or population planning and how homogeneous or segmented the target population is likely to be. Just before launching the survey, the government announced it was closing the park and relocating whole villages. The research team decided to proceed with the survey, whose subject matter had become of intense interest to the communities around the park.

BACKGROUND

To slow the erosion of forest resources [note 4], the Dominican government designated Los Haitises as a forest reserve in 1968 and a National Park in 1976. In 1968, the government defined the

park as 208 kilometers squared near the center of a karst platform, an irregular limestone region, of 1600 kilometers squared. In 1976, the government enforced more restrictions. And since then, there have been various attempts to define a buffer zone, but these have lacked a clearly-defined legal status.

Many people live near the park boundaries. The 1981 census counted 39,000 people in the 11 "secciones" of the region, an area defined by a team of Spanish experts [note 5]. High rates of natural increase [note 6], combined with the displacement of rural populations caused by hurricanes and the decline of plantation employment, have fed this demand for land. Consequently, the park area has attracted many settlers and nonresidents who have exploited it for cattle grazing and subsistence crops. In addition, there has been increasing demand from Dominicans living in New York for the starchy vegetable, "yautia" [note 7]. This has resulted in its extensive production as a cash crop.

Sporadic efforts by the government to police the area and uncertainty about the precise borders of the park angered and confused the population. But it deterred few from exploiting the park's resources. Toward the middle of 1992, the government announced that, in order to save the park, it would be necessary to remove any people or cattle in it by force. The government said it would relocate many entire communities situated within or near the park borders [note 8]. President Balaguer instructed the Secretary of the Armed Forces to resettle almost 20,000 families, 5,000 of those within three-and-a-half months. The Dominican army immediately sent troops to enforce the ban, close the area from journalists and others, and appoint a high level commission to direct the relocation process. The army cut fences, removed thousands of cattle, and advised farmers that they could harvest existing crops but plant no more. Since this deprived many people of their livelihood, the government supplied food rations to villages bordering the park. Officials also told residents that they would soon receive land and housing in areas farther from the park.

More than a year and a half after the initial announcement, the government had moved only a small number of residents to new locations [note 9]. For about a year before the army occupation, an interdisciplinary team from Cornell University and the Universidad Nacional Pedro Henriquez Urena had been informally studying the area. After the occupation, this team obtained permission from the presidential commission to enter the area and conduct a small survey.

SURVEY DESIGN

A Dominican organization with extensive survey experience, the Instituto de Estudios en Desarrollo y Poblacion (IEDP), translated and pre-tested the questionnaire, trained the interviewers, conducted the survey, and provided preliminary results to the communities and the government (Duarte and others 1993). The survey team only scheduled a small number of interviews because of limited resources. After selecting villages, they followed systematic sampling procedures.

The four small communities selected represented different relocation prospects (see figure 1). The government had identified two villages (Los Limones and Majagual) for probable relocation. The third village (Gonzalo) was close to the park but probably would not relocate. The fourth village (Altagracia) was a new resettlement and a probable community for relocated villagers. In each village, the survey team first consulted with local leaders. Then they enlisted village committees to help with the research, submit survey questions, and receive research results [note 10]. In order to include community characteristics, the team administered a special questionnaire to several leaders in each village. Village leaders received a preliminary report in December 1992.

After preparing maps of household locations, the survey team randomly selected 36 agricultural households in each village with at least one adult engaged in agricultural work or holding farm land. In each household, the head and mate were interviewed separately, using the same questions for about two-thirds of the interview. This resulted in 139 male- and 123 female-completed questionnaires. The one hour interview covered respondents' social and economic characteristics.

COMMUNITY AND HOUSEHOLD CHARACTERISTICS

Each community is small, under 500 families, but three of the villages are within one hour's truck ride of the small urban center Sabana Grande de Boya (see figure 1). The residents of the fourth, Los Limones, require about two hours of difficult driving to reach the nearest town. None of the villages has a telephone, doctor, or clinic; only Gonzalo has electricity. Eight of every 10 households use wood as their main fuel. Each community has at least one Protestant and one Catholic Church, one primary school, and at least three small general stores ("colmados").

The villages are poor but by no means impoverished. For example, 17% of the households in Los Limones reported having motor bikes;

25% have gas stoves; and 66% have radios. Excluding separate kitchens, most houses have three or more rooms. In the three villages without electricity, nearly all homes use kerosene for light. Almost all houses have some type of sanitary facility, usually a latrine. One-third of the men and a slightly higher proportion of women have never attended school. Three percent of the sample have had some secondary schooling.

Most of the adult population are migrants to the area [note 11].

Three-quarters of these people believe they are better off than in their previous place of residence. They cite a house, land, or productivity as evidence of their improved standard of living.

However, the resettled people of Altagracia have a different view. More than half of them (54%) say they are worse off, compared with only 5% in the other villages.

Although nearly all of the males are self-employed farmers, one-quarter of them are also engaged in off-farm activity. Two-thirds of these males employ help on their medium-sized farms, indicating that they are reasonably prosperous. However, the variation among villages is considerable. Thus, the mean plot size was 30 hectares (472 "tareas" [note12]) in Gonzalo, 11 hectares (183 "tareas") in Majagual, 4 hectares (69 "tareas") in Altagracia, and 75 hectares (1186 "tareas") in Los Limones. Asked to evaluate their land as "good, fair, or poor," most farmers chose "good," except in the previously resettled community, Altagracia, where three-fourths chose "fair" or "poor" [note 13]. In the three older communities, farmers use only about 10% of land for crops with major portions in pasture or lying fallow. The majority of farmers sell most of their production, especially the cash crop "yautia."

KNOWLEDGE OF THE ENVIRONMENT

The team asked villagers a series of questions to ascertain their

knowledge about the nature and location of the park. The interviewers began with the open-ended question, "What, for you, is a national park?" Forty-one percent suggested that it was a private or reserved area, but one-quarter could not answer the question (21% of the males and 29% of the females). Another quarter answered that it was an area with many trees or a place for picnics. Thus, while a substantial minority seem to understand the concept of a restricted access reserve, many villagers seemed to have only a vague idea.

Asked directly if they had heard of a buffer zone ("zona de amortiguamiento"), only one-fifth said yes (14% of the females).

More than nine of every 10 respondents said they had never visited a national park. But nine out of every 10 affirmed later in the questionnaire that they "used Los Haitises National Park" for one or more activities (see table 1). Most families reported using it during much of the year. These findings suggest that the concept of Los Haitises as a national park is unclear.

Villagers may be even less aware of park boundaries and the number of people affected than of the park concept itself. This is not surprising since the boundary was uncertain at the time of the survey and authoritative statements have been scarce and inconsistent. At the height of the controversy in the summer of 1992, one newspaper reported the park area as 180 kilometers squared (HOY 6/16/92). Another newspaper reported 208 kilometers squared (LISTIN DIARIO 6/10/92), and still another claimed 1400 kilometers squared (ULTIMA HORA 6/15/92).

Table I Five Questions Concerning Activities in Los Haitises Park*

A. "Which of these activities were permitted ("estaba permitido") in the region of Los Haitises before the resettlement?"

B. "Which activities do you think should be permitted ("deberia permitirse")?"

C. "Which activities harm the environment in the region of Los Haitises?"

D. "For which activities were you or your family using the Park before the resettlement?"

E. "Which activity was most important to you?"

(In %)

	A. Was Permitted	B. Should Be Permitted
Burning	40	4
Clearing	47	9
Cutting Trees	49	9
Collecting Firewood	9	3
Grazing Cattle	85	53
Growing Fruit Trees	95	90
Cultivating Small Mixed Crop Plots ("Conucos")	93	74

	C. Harmful to Environment	D. Used Park
Burning	97	29
Clearing	96	38
Cutting Trees	93	35
Collecting Firewood	20	73
Grazing Cattle	50	41

Growing Fruit Trees	12	81
Cultivating Small Mixed Crop Plots ("Conucos")	34	82

E. Most Important Activity

Burning	1
Clearing	0
Cutting Trees	0
Collecting Firewood	4
Grazing Cattle	7
Growing Fruit Trees	20
Cultivating Small Mixed Crop Plots ("Conucos")	67

*The number of cases for each is approximately 259.

At the time of the army takeover, national census data were more than a decade old. Moreover, many park users reside elsewhere or live only temporarily in or near the park. As a result, newspapers also disagree about the number of people to resettle.

HOY stated that more than 20,000 people live in the area but later referred to 20,000 families (7/16/93). ULTIMA HORA cited a 1981 population of 37,000. An authoritative report from a Spanish technical team cryptically announced:

"At present it is estimated that between 15,000 and 20,000 persons are directly connected to the protected area of Los Haitises. In the area of the Management Plan, this population reached 59,500 in 1981 (Direccion Nacional de Parques and others 1989: 39)."

Interviewers asked residents of the two villages adjacent to the park, Los Limones and Majagual, (see figure 1) two questions about the park's location.

Before the resettlement operation, how far from this village (in kilometers) did you think the Los Haitises Park was?"

And now, how far do you think you are from the boundaries of the National Park Los Haitises?"

In answer to the first question, 17% said they did not know, and only 7% said they were living as close as five kilometers. In answer to the second question, 21% said they did not know, and 43% thought they were within five kilometers, a six-fold increase. In essence, villagers claimed they only recently learned how close they were to the Park.

LOCAL PERCEPTIONS OF CONSERVATION

In a personal interview, a government official with the resettlement program voiced a common belief concerning the need to educate the villagers about conservation. "We have to educate the peasants; they are not aware of the national importance that Los Haitises has. Besides, they do not know the benefits of the tree and the damage they are producing" (Secaira 1993: 69).

In fact, villagers seem quite knowledgeable about the forest area and conservation. Interviewers asked, "What benefits does the community get from preserving the forest?" The team recorded up to three open-ended responses verbatim then coded them. Nearly all the male and female respondents (95%) were able to cite a benefit. Forty-five percent of the benefits identified were ecosystem functions related to rainfall, such as providing water or maintaining moisture. Another 26% of the perceived benefits referred to animal and plant preservation, while the rest dealt largely with soil enrichment.

Examples from Secaira's qualitative interviews (1993) give the flavor of their information, and, in one case, the source of information.

"I let the forest grow on the top of the hill because that helps the lower parts. The erosion in the top runs down and fertilizes the lower parts (p. 72)."

"When you clear the forest the air gets warmer; the water recedes; rivers do not run or very little, only when it rains. The springs dry up (p. 72)."

"We learned to change (from burning) first when the authorities told us, and then our own associations told us as well. There used to be a radio program...(p. 78)."

To identify villager's awareness of the park's shrinking resources, the survey team asked participants, "Since you have been living here, do you think that the forest area ("area con montana) has increased, decreased, or stayed the same?" Although about half (46%) thought it had decreased in size, more than one-third (37%) thought it had increased. The remainder (17%) thought it had stayed the same. Some participants may have interpreted this question to mean that park boundaries had become more inclusive. In this case, they could have seen the park as growing. However, in response to an open-ended question asking for an explanation, the half who thought the forest had shrunk clearly understood the causes. Two-thirds of them cited clearing, another 12% mentioned burning, and most of the remainder referred to some kind of cultivation.

Finally, have villagers been aware of government restrictions on their activities in the park? Table I presents responses to a

series of questions about burning, clearing, tree cutting, firewood collection, grazing, farming, and fruit tree cultivation in "the region of Los Haitises." In each case, interviewers asked respondents whether the government permitted the activity before the relocation announcement (see column 1). From 80 to 95% stated that cultivating, grazing cattle, planting fruit trees, and collecting firewood were permitted. Only 40 to 50% claimed that burning, clearing, or tree cutting were permitted. More men than women reported that various activities were permitted, significantly so for two items [note 14].

In this case, the wording of the question may have been ambiguous since it referred to "the region of Los Haitises" (emphasis added). On the other hand, respondents may have been confused about the restrictions since these were not consistently enforced. According to one farmer, "The big ones deforest and are not disturbed. If a small one cuts a tree, he is sent to jail. But if he is a government official, nothing happens to him." And a Park Service guard complained, "The Park Service cannot do anything with cattle ranchers. If we prosecute them, their congressmen order them freed" (Secaira 1993: 86).

GENERAL ENVIRONMENTAL ATTITUDES

The interviewers asked respondents to agree or disagree with some statements designed to reflect general attitudes toward environment (see table 2). The response patterns indicate that most villagers believe in conservation. However, the questions are highly general and abstract, without specific references to the immediate environment.

Table 2 - Attitudes Toward the Environment, by Sex

	(% who agree)		
	Men	Women	Total
1. Something should be done to protect animals, parrots, and other birds.	100	99	99
2. It is necessary to cut the forests in order for the country to progress.	11	9	10
3. Cutting trees should be prohibited in order to protect the forests.	88	90	89
4. The government should permit limited tree cutting.	81	67	75

5. If the government permitted tree cutting, the people would be more concerned to plant trees. 69 61 65

6. The nation should produce more food, although it means cutting down our forests. 45 49 46

Number of Cases (I38) (II8) (259)

Items included in table I are more specific about conservation-related practices. Interviewers asked respondents whether or not seven potentially harmful activities "should be permitted in the region of Los Haitises" (see column 2) and whether or not the activity is harmful to the environment (see column 3). Virtually everyone stated that burning, clearing, and cutting trees are harmful and should not be permitted.

Almost everyone believed that "fruit trees" are harmless and should be permitted. There was less consensus on collecting firewood. Four-fifths believed that it is harmless and should be permitted. Two-thirds of the villagers regarded small, mixed crop plots ("conucos") as harmless, and three-quarters believed they should be permitted. Pasturing cattle divided the sample. Half the respondents believed it was harmful and half not [note 15].

With these exceptions, most villagers favored restricting the most damaging activities to the park. Thus, the sample reflected conservationist values in general and with respect to the respondent's immediate environment. For differences by gender, almost all fell short of statistical significance. Both sexes generally favored a conservationist position.

However, respondents, especially those with little education, found it easier to agree than disagree with statements. Thus, it is of special significance that nine out of 10 disagreed with the statement that "cutting forests is necessary for the country's progress." And nearly half disagreed with the statement, "The country should produce more food, even if it means cutting our forests." The fact that villagers tended to disagree with these statements increased the meaningfulness of the responses.

BEHAVIOR

While it helps to understand attitudes, it is usually behavior that counts with respect to the environment. What people say they think and say they do may be quite far apart. What they really think and really do may be even farther apart. This study deals largely with what people say they think and do.

Table I, column 4, shows whether the respondent reports that s/he, or a member of the family, used the National Park for any of the seven activities. Strong majorities said they planted fruit trees, cultivated small plots, and collected firewood, while strong minorities admitted clearing/burning activities and grazing cattle. After identifying activities, respondents were asked which one of the activities "was most important for you" (see column 5). Virtually no one mentioned clearing, cutting, or burning, and very few villagers cited collecting firewood or grazing cattle. By far the most important activity was cultivating a small plot. In the four villages, 45 to 80% of the farmers said they sold some of last year's agricultural produce.

And 33 to 63% said they sold the majority of it. This shows that villagers depend on their small plots for cash crops (largely "yautia") as well as for food.

ATTITUDES TOWARD RELOCATION

In the two villages that the government planned to move, the survey team asked the following two questions. "Do you think that the move will benefit, harm, or not affect this community?" "And you, will it benefit, harm, or not affect you?" Ninety-five percent of the males and the same percentage of females answered that it would be harmful to the community. The same percentage said it would be harmful to themselves.

Interviewers also asked whether respondents had experienced any problems as a result of the army takeover of the park a few months ago. One-third said they already had. These respondents were then asked to identify up to three problems. Of 62 responses, the most frequently-mentioned problem was loss of work because of farming and grazing restrictions in the park (40%), followed by forced animal sales (24%). Men gave these reasons more frequently than women who expressed more anxiety about relocation (fear of worse living conditions, an unknown future, etc.).

To test feelings about the move, we made a list of six hypothetical conservation measures. We asked whether or not respondents would be willing to carry out any of these conservation measures should they not be relocated. "In case you remained in the buffer zone of the park, would you be willing or not willing to..." (see table 3). Strong majorities of both sexes said they would be willing to help police the area, participate in reforestation efforts, and avoid cutting wood. About two-thirds said they would reduce cattle holdings or land holdings. But only half said they would be willing to stop cultivating "yautia" as a cash crop.

Table 3 - Percent Willing to Carry Out Specified Behavior in Los Limones and Majagual

	Men	Women	Total
Reduce land holding size for each family	65	61	64
Reduce cattle holdings to one or two head per family*	76	61	69
Not cut wood in the forest	86	81	84
Participate in policing the area	96	93	95
Stop cultivating "yautia" for sale**	61	41	52
Participate in reforestation	94	88	92
Number of Cases	(72)	(59)	(131)

* $p < .10$ (statistically significant at less than the 10% level)

** $p < .05$ (statistically significant at less than the 5% level)

Interviewers asked villagers from Los Limones and Majagual the following open-ended question. "In case you are moved, what services do you consider indispensable in the new location?"

More than three-quarters of the respondents cited drinking water, electricity, and a health clinic. Only 54% of the respondents cited a school and 29% a church [note 16]. When asked to identify which one of those services was most important, respondents identified potable water as the top priority (31%). A clinic (28%) followed next, then a school (23%), and, then surprisingly, electricity (only 6%) [note 17].

How much land would relocated farmers consider necessary, assuming good quality soil but no irrigation? Only one-fifth of the respondents thought less than 3 hectares (50 "tareas") would suffice. One-third cited from 3 to 29 (50 to 100 "tareas"), and the rest thought more than 29 (100 "tareas") were necessary, with no difference by gender. Presently, 85% of the plots in the resettled community of Altagracia have less than 3 hectares (50 "tareas"), whereas most farmers in the other three villages have more. Nearly everyone (90%) said that women should have the same rights to land as men.

Finally, there is a very favorable attitude toward community self-help. All four villages know about organizations such as farmers cooperatives and mothers clubs. One-half of the men and one-quarter of the women belong to such groups. When asked who had brought the most benefits to the community, the government, private entrepreneurs, or community groups, two-thirds of both sexes opted for the latter. Similarly, when asked who would be best to control the park, the forest service, private enterprise, or the community, three-quarters chose the community.

Virtually all (96%) of the male farmers and most of the women

have had direct experience with a park guard or representative. These experiences have not been especially favorable. When asked whether their impressions of the forest service officials were good, bad, or fair, as many said bad as good (43%) with women considerably more negative than men.

ENVIRONMENT AND SOCIAL DIFFERENTIATION

Thus far, we have treated our sample as if it were a homogeneous mass. In fact, there is considerable variation within it. We will next look at this variation by creating two indices. The first measures attitudes toward the environment. The second measures behavior by looking at how much people use the park.

Attitudes

The environmental index represents the sum of six attitude items.

Three of these, scored 0 or 1, represent negative or positive responses to the following questions.

Which of the following activities do you believe harm the environment in Los Haitises:

- a. burning?
- b. clearing?
- c. cutting trees?

The remaining agree-disagree items were also scored as 0 or 1, with agreement scored 0.

It is necessary to cut forests for the country to progress.

If the government permitted cutting trees people would be more concerned to plant them.

The country should produce more food even if it has to cut our forests.

A higher score on the six items indicates attitudes more favorable to the environment.

Behavior

This index represents the sum of responses to seven items about respondents using the park for burning, clearing, etc. (see table

1). Since each activity scored 1 (no activity was 0), higher scores indicate more activity in the park. We anticipated variation by gender, age, economic status, education, and religion since these variables frequently predict attitudinal and behavioral differences. In addition, we anticipated that involvement in cattle ranching and membership in voluntary organizations might affect attitudes. Finally, we wanted to know if there was any relationship between attitudes toward population and family size and environmental attitudes. Table 4 shows statistics describing the dependent variables and their correlations with 12 other social and economic characteristics that we hypothesized would be related.

The first conclusion is that, except for age, usually powerful predictors such as education and gender have little or no relationship to environmental attitudes or park use [note 18]. Second, neither desired nor actual family size relates to environmental attitudes or behaviors [note 19]. The key variables for environmental attitudes are one's community, time lived in the community, economic status, and religious preference. Likewise, park use is significantly related to the community, years lived in the community, and religion. In addition, park use correlates negatively to cattle raising and positively to membership in organizations.

Los Limones and Altagracia lie at opposite ends of a continuum. Los Limones is closest to the park and scheduled for relocation.

The government resettled Altagracia five years ago and mentioned it as a likely destination for uprooted villagers. On the environmental index, Los Limones shows the least favorable attitudes and Altagracia the most favorable (means are 1.65 and 2.23). Los Limones also has the lowest scores on park use and Altagracia the highest (means are 3.60 and 4.90).

Therefore, can we say that people who use the park most have the most positive environmental attitudes? Not at all, since the correlation of the two scores approaches zero (-.02). It may be that Altagracia residents use the park more because they have so little land of their own, receiving only about 2.5 hectares (40 "tareas") each when resettled there. Los Limones residents, who live in or on the very edge of the park, may have under reported their park use to our interviewers.

Table 4 - Environmental Attitudes and Park Use Indices

A. Characteristics of Indices	Environmental Index	Park Use Index
Range	0-6	0-7
Mean	4.7	3.8
Standard Deviation	1.1	2.2
Median	5.0	4.0
Cronbach's Alpha	0.65	0.83

B. Pairwise Zero Order Correlations with:

I. Gender	--	--	
2. Education	--	--	
3. Age	--	-.16*	
4. Economic Status		-.26**	-.11*
5. Village			
Los Limones		-.27**	--
Gonzalo	--		-.18*
Altagracia		.29**	.30**
6. Ranching	--		-.12*
7. Years in Community		-.22**	-.30**
8. Children Ever Born	--		--
9. Ideal Number Children	--		--
10. Want More Children	--		--
II. Religion		-.13*	-.22
12. Organizational Memberships	--		.17*
13. Environmental Attitude Index	--		-.02

-- p > .05 (statistically significant at less than the 5%

level)

* p < .05 (statistically significant at less than the 5% level)

** p < .01 (statistically significant at less than the 1% level)

C. Variable Descriptions

1. Male = 1, Female = 0
2. Years of Formal Schooling
3. Years
4. The Sum of Scores on Three Types of Possessions:
 - a. Landholdings (<101 "Tareas" = 2, 101-500 "Tareas" = 4, 501+ "Tareas" = 6)
 - b. Cattle (0-5 = 0, 6-25 = 1, 26+ = 2), and
 - c. Possessed a Horse or Mule = 1, Neither = 0
5. Dummy Variables. Majagual = 0
6. Farmer = 1, Farmer-rancher = 2
7. Number of Years Respondent has Lived in the Village
8. Number of Children Ever Born (Women Only)
9. Women Only
10. Yes = 1, No = 0 (Men Only)
11. Catholics = 1, Other = 0
12. No Membership = 0, One or More Memberships = 1
13. Six Category Environmental Index, High = More

"Environmentalist"

Park Use Index, High = Greater Use (see p. 12-13)

However, the communities differ in other related variables. No one has lived in the resettled community of Altagracia for more than five years, and its economic level is the lowest of the four communities. At the other extreme, Gonzalo has the highest proportion of long-time settlers. Los Limones is the most well-to-do in terms of land holdings and animals. In order to untangle these characteristics and see whether they account for

community differences, we carried out a Multiple Classification Analysis (see table 5). It includes the four most significant variables: economic status, length of residence, religion, and community.

These variables account for 15% of the variance in attitude and 14% in behavior. Only religion and community show significant relationships when the others are held constant. Holding the other three variables constant (economic status, length of residence, and religion), Altagracia is still the most positive about the environment and Los Limones the most negative.

Altagracia residents are most likely to use the park. For unknown reasons, non-Catholics are more positive about the environment and more likely to use the park than Catholics [note 20]. The relationships with religion are strengthened when economic status, community, and length of residence are controlled.

Table 5. Multiple Classification Analysis of Environmental Attitude and Park Use

	Mean Environmental Attitude		Mean Park Use	
	Unadjusted	Adjusted-a	Unadjusted	Unadjusted
Adjusted-a				
Los Limones	4.16	4.18	3.58	3.46
Majagual	4.78	4.84	3.50	3.72
Gonzalo	4.48	4.58	3.02	3.23
Altagracia	5.19	5.01	4.92	4.59
Eta	.35	.29	.31	.23
Non-Catholic	4.88	4.95-b	3.46	3.51-b
Catholic	4.58	4.56	4.58	4.46
Eta	.12	.16	.22	.19

Multiple R² = .154

N = 251

a-Adjusted for religion, economic status, and total years lived in community

b-Adjusted for community, economic status, and total years lived in community

ATTITUDES TOWARD POPULATION AND FAMILY SIZE

Results from the 1993 national census will produce definitive data on population change around the park. Professionals working in the region agree that population is growing but disagree about how much [note 21]. Whatever the true rates, our principal interest was in villagers' perceptions and attitudes about

population growth including their own family growth rates.

Most villagers believe that their communities are growing. Interviewers asked, "In the past 10 years do you think the number of persons in this community and its surroundings has increased, stayed the same, or gone down?" Seventy-nine percent said their communities had increased; 4% said their villages stayed the same; and 13% said their populations had declined.

The next question asked why (open ended) and whether it was good or bad for the community. Of the majority who thought population was growing, 89% thought it was a good thing. Of those who saw no change in size, 58% saw it as good. Among the minority who thought population was declining, only 15% regarded it favorably.

In short, there is almost a universal perception of population growth with a highly favorable attitude toward it.

Half of those who favored population increase explained that it enhanced the power of the community. They illustrated this attitude by the saying, "Donde hay mucha gente se lucha mejor" (more people can struggle better). Many respondents believed population growth increased business or production. Despite a certain sophistication concerning the environment and generally favorable attitudes toward conservation, virtually no one connected population growth or density with the environment or park deterioration.

At the household level, human fertility in Los Haitises is very high. A recent national survey places the current total fertility rate for rural areas of the Dominican Republic at 4.4 (Anonymous 1993). This tells us that, assuming current age rates, rural women (married and single) would have an average of 4.4 live births by the time they complete childbearing. In our sample, married women 45 and over have had almost twice as many or 8.3 live births. Even those aged 30-44 have had 6.3, while those under 30 have already had an average of 3.7.

The number of children considered ideal by female respondents (not asked of men) is also high, 5.6 compared with a national rural average of 3.7 (Anonymous 1988). Even women under 30 preferred an average of 4.3 children. Nevertheless, 60% of the women have attempted to limit their fertility. Of these, 72% have been sterilized. This means that nearly half (43%) of the married women in our sample are sterilized. This is just above the national average (39%) for all adult women, married and single (Anonymous 1993).

The impact on fertility is small because most sterilized women have already had 6.5 live births. Only one in 10 women had ever used contraception prior to sterilization. However, age differences in contraceptive use may suggest a new trend. While only 10% of women over 44 have ever used a contraceptive method, 41% of those aged 30-44 and 65% of those under 30 have used contraceptives. Of those who are at risk of pregnancy (not

sterilized and under age 50), only one-third say they know where to get family planning advice, and only one-fifth have ever visited a family planning clinic.

DISCUSSION

The Dominican government has taken strong measures to stop the increasing deterioration of forest area. Government officials have announced a relocation policy for several villages which they will enforce with army troops. What has our survey found that could help policymakers in the Dominican Republic and other nations facing similar problems?

We found villagers almost unanimously opposed to resettlement. They depend heavily on the park for income through "yautia" production and cattle raising. And they are skeptical about land and housing promised by the government. Judged by the one resettlement community in our sample, their fears may not be groundless. Altagracia residents are poorer; soils are less productive; plots are smaller; and residents are unhappier than in the three other villages. More than half the residents say they are worse off than before moving. Moreover, Altagracia residents reported the heaviest reliance on park resources. If resettlement does not provide adequate facilities and income, people may move back into the newly-vacated buffer zone, resulting in more coercive measures from government troops.

Park boundaries and definitions have been a source of confusion.

Villagers were unclear on a number of crucial issues. What is a national park? How far are they from the park? What is a buffer zone? Precisely what activities does the park permit and forbid?

This suggests a need for better information programs [note 22].

Villagers were more sophisticated about environmental implications of the park and more favorable to the need for environmental restrictions than anticipated. This suggests a readiness for compromise. Villagers confirm this by their willingness to limit the most detrimental activities to the environment such as cutting and clearing and their willingness to help enforce restrictions. However, villagers usually regarded collecting firewood and raising crops on small plots as harmless activities. Since crops provide income, it is the most important point of conflict. The ability to compromise is even more likely because of villagers' considerable participation in action-oriented Private Voluntary Organizations.

With or without resettlement, policymakers must deal with the problem of rapid population increase. First, any park management

program must consider villagers' favorable attitude toward population growth. In a model program of community development involving education and group consensus, communities should consider the advantages and disadvantages of population growth. Further, officials should create public policies and programs that address natural increase (births minus deaths) and net migration since both affect population growth.

With respect to fertility, village women favor having large families, but the prevalence of sterilization suggests a strong demand for fertility control. Since most sterilizations occur after the sixth birth, the impact on birth rate is modest. Nevertheless, younger women are beginning to use contraceptives earlier than the older women.

All of this suggests it might be time for a family planning program that:

- * stresses spacing rather than stopping fertility,
- * emphasizes early adoption of non-permanent contraceptive methods, and
- * includes the linkages between community demographic goals and individual fertility behavior.

Since villagers identified a health clinic as the greatest community need after water and electricity, they should favorably receive health extension efforts that include family planning activities.

Dealing with in-migration is more problematic. If consistent with community well-being, migration control could be part of a community-based program of park protection. If villagers reexamined and revised their beliefs about the beneficial effects of population increase, a combination of local and national incentives and disincentives might help control immigration. Guidelines policed by the community rather than by national personnel should have a greater chance of success (Wells and others 1992).

The four communities in our survey differ greatly in attitudes toward the environment and use of the park. Using 12 potentially explanatory characteristics, our statistical analysis failed to account for most of this variation. Religious affiliation and community were the only critical independent variables. This not only suggests a need for further research but has important policy implications because each village may react quite differently to program interventions. It should also help social programmers to know that differences of opinion are minimal by gender, education, or age.

Tailoring programs to communities supports the argument for integrating conservation with community development activities such as social, economic, and demographic planning. Such programs are rare on paper and scarcely ever seen in practice.

As a recent review in PEOPLE AND PARKS put it, "In virtually all the projects, the critical linkage between development and conservation is either missing or obscure" (Wells and others 1992: x). Equally rare is the participatory mode of expediting such goals. In our survey, at least 75% of the villagers believe that communities themselves are the best sources of forest control. But as noted by West and Brechin (1991: 396), "True participation...is sincerely advocated by many of our authors but is rare in actual practice." Most end-of-project reports read like the conclusion of some progressive projects in Thailand and Madagascar:

"The development activities...have been inadequate and of an ad hoc and short term nature. Despite the professed aims of the project, these activities were planned from above with little or no participation by the local people (Ghimire 1991: i)."

Relocation projects are especially vulnerable to failure. However, their chance of success can improve with more care in researching the communities of origin and destination. In addition, they need greater efforts to involve villagers in research, planning, and monitoring and a more thorough integration of conservation and community development. This is not to minimize the real conflicts of interest that exist between farmers and national-level conservationists. Participatory programs may enhance or even be required for success. However, they cannot necessarily solve the difficult problems of providing adequate sustenance for rural populations and also conserve natural resources. The next step for research will be to see what kinds of trade-offs and compromises are feasible in situations like Los Haitises [note 23].

We have learned that it is possible to obtain useful data on attitudes and behavior from a population with little formal education, even during a period of severe stress and personal involvement. However, the study has at least two major limitations that suggest caution in generalizing the findings without further investigation. First, the sample was small and confined to villages. It excluded isolated households living outside of villages. Second, we did not carry out systematic reliability or validity checks. Nevertheless, we are confident that the data are reasonably reliable: no one refused to be interviewed, and even delicate personal questions such as contraceptive use caused little difficulty. Moreover, there was little evidence of a tendency to agree with items out of an "acquiescence set" or a desire to please the interviewer.

However, it is important to note that we took special pains to consult community leaders prior to the survey. We also established committees to discuss both the questionnaire and the survey findings which we delivered within a few weeks of the survey. In short, it is possible that community participation in the study enhanced its acceptability and validity.

ENDNOTES

1. As Rudel (1993: 2) expresses it, "Does population growth or proletarianization explain why peasants so often try to carve farms out of the rain forest?" These are not the only causes, however. Pichon (1992: 662) identifies them as demographic, economic, and political. See Bilborrow (1992) for a more complete list.
2. Poverty may stimulate or depress population growth depending on its net impacts on mortality and fertility. On the other hand, population size and growth can sometimes stimulate local economic development through enhanced political power, division of labor, and economies of scale. However, population growth can also aggravate poverty by precipitating unemployment, reducing savings, and reducing per-capita consumption.
3. A review of 24 Integrated Conservation Development Projects (ICDP) concluded that "progress has been very modest" (Wells and others 1992: 60). According to a United Nations review of migration programs, "Population distribution policies have become somewhat discredited, mainly because there have been many more failures than successes" (UN 1993: 37). Resettlement programs have been especially problematic.
4. Between 1981 and 1990, the annual rate of deforestation in the Dominican Republic was 2.5%. This equals a total of 35,000 hectares (World Resources Institute 1994: 307).
5. These sections are census districts used by the Spanish team to define the park and its peripheral area (Direccion Nacional de Parques and others 1990).
6. The nation's population grew by 2.6% per year in the 1970s and 2.2% in the 1980s (World Bank 1993). Population doubled between 1950 and 1970 (from 2.1 to 4.0 million) and is expected to reach 8.6 million by year 2000 (ONE-CELADE 1985).
7. "Yautia" ("*xanthosma sagithfolium*") is a close relative of taro.
8. However, there was considerable ambiguity about which villages the government would move and when and where? Precisely what could people expect in the way of land, housing, and community facilities. For example, the Director of the Dominican Agrarian Institute announced it would resettle 10,000 families within a year. On the following day, he was quoted as saying eight, nine, or 10 thousand families. The Army Colonel in charge of the relocation referred to 2,000 families with 22,000 members. Other newspaper reports referred to 15,000 families (HOY 6/9, 6/13, and 6/22 1992). In March 1993, a definitive presidential decree ordered "...the immediate cessation of any activity in Los Haitises and the buffer zone. Violations will be severely

punished" (EL SIGLO 3/26 1993).

9. In March of 1994, the director of the Dominican Agrarian Institute announced it had awarded 295 land parcels to Los Haitises families (LISTIN DIARIO 3/16/94).

10. Fernando Secaira and Simon Mart!nez were largely responsible for this activity. Secaira conducted informal interviews and participant observation as part of the team research.

11. A recent study found that only 26% of the national rural population had migrated to their communities (Duarte and others 1993). However, 90% of the sample's household heads were born outside of their present residence. But most migrants are not newcomers. In three of the four communities, from two-thirds to three-quarters moved more than 10 years ago. Most of these had moved more than 20 years ago. However, the government had resettled nearly all the Altagracia residents less than five years ago. Nearly all migrants previously lived in another rural area, and about half moved directly from their place of birth. About half of the males came to find land, work, or to improve their economic situation. But significant minorities in all villages came because they lost their land or were moved from it.

Much of this resulted from President Trujillo's converting large tracts of land into sugar cane cultivation in the 1950s.

12. There are 15.9 "tareas" in a hectare. The Limones mean was inflated by several cases with unusually large land holdings, more than 220 hectares (3500 "tareas") including one of 10,000. An independent census of 273 Limones families taken around the same time by community groups shows a mean holding of only 24 hectares (386 "tareas") (Secaira 1993).

13. Moreover, half of the Altagracia households said they had lost most of their crop last year from an insect infestation. People say this resettlement community has unproductive soils because of chemical residues left in the fields from earlier sugar estates.

14. These were the only two statistically significant differences ($< .05$) between the sexes in the 35 gender comparisons of items contained in table I. They refer to the permissibility of collecting firewood and clearing.

15. "Grazing" may refer to a single cow or a large herd, with very different implications for the forest.

16. More women than men wanted a school and church.

17. However, when asked to identify the main problems currently faced by their communities, the priorities were somewhat different and varied by community. In Los Limones and Majagual, most at risk of relocation, the most frequently-mentioned problems were relocation and poor roads, both cited by strong

majorities. People in Gonzalo also mentioned these two problems most frequently but in somewhat smaller majorities. In already resettled Altagracia, water and health services were most important (56% each) followed by electricity and schooling (Duarte and others 1993: 33).

18. After evaluating a number of studies involving demographic variables, Kempton (1993: 9) concluded that age is the only socio-demographic variable "strongly and consistently correlated with public environmentalism."

19. We hypothesized that large families (in fact or by preference) would increase the motivation to use park resources.

We also thought that negative attitudes toward community population growth would accompany more environmentalist attitudes. However, since the attitude toward community growth was almost unanimously positive (see page 16), we could not test its relationship with population attitudes.

20. White (1992) found non-Catholic Haitians more likely to participate in community environmental projects. He hypothesized that such minority group members might be more innovative or receptive to change. Moreover, Catholic priests in the Los Haitises region have emphasized the priority of human needs over environmental protection.

21. A team of Spanish experts estimated that the birth rate in Los Haitises was much higher than the national average. But they judged the overall population growth rate of population to be lower than average due to heavy out-migration (Dirección Nacional de Parques and others 1989: 42). Others believe that while "some people are leaving the area...many more are coming in" (Pena 1992: 9). The overall annual growth rate is almost certainly positive.

22. Assisted by a team of Spanish researchers, the study blamed many of the area's problems on "lack of adequate norms for use, and the deficient delimitation of the Park" (Dirección Nacional de Parques and others 1990: 11). This may not be an uncommon situation. Describing a relatively successful effort in Costa Rica, Jones (1992: 692) concludes that "Public awareness of park boundaries, limitations on legal access, and an awareness of benefits accruing to park neighbors to a large extent have been a cost-effective strategy" (emphasis added).

23. For suggestions about the directions research should take to better negotiate "partnerships between rural people and protected areas," see Schelhas and Shaw (1994) and Schelhas (1994).

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