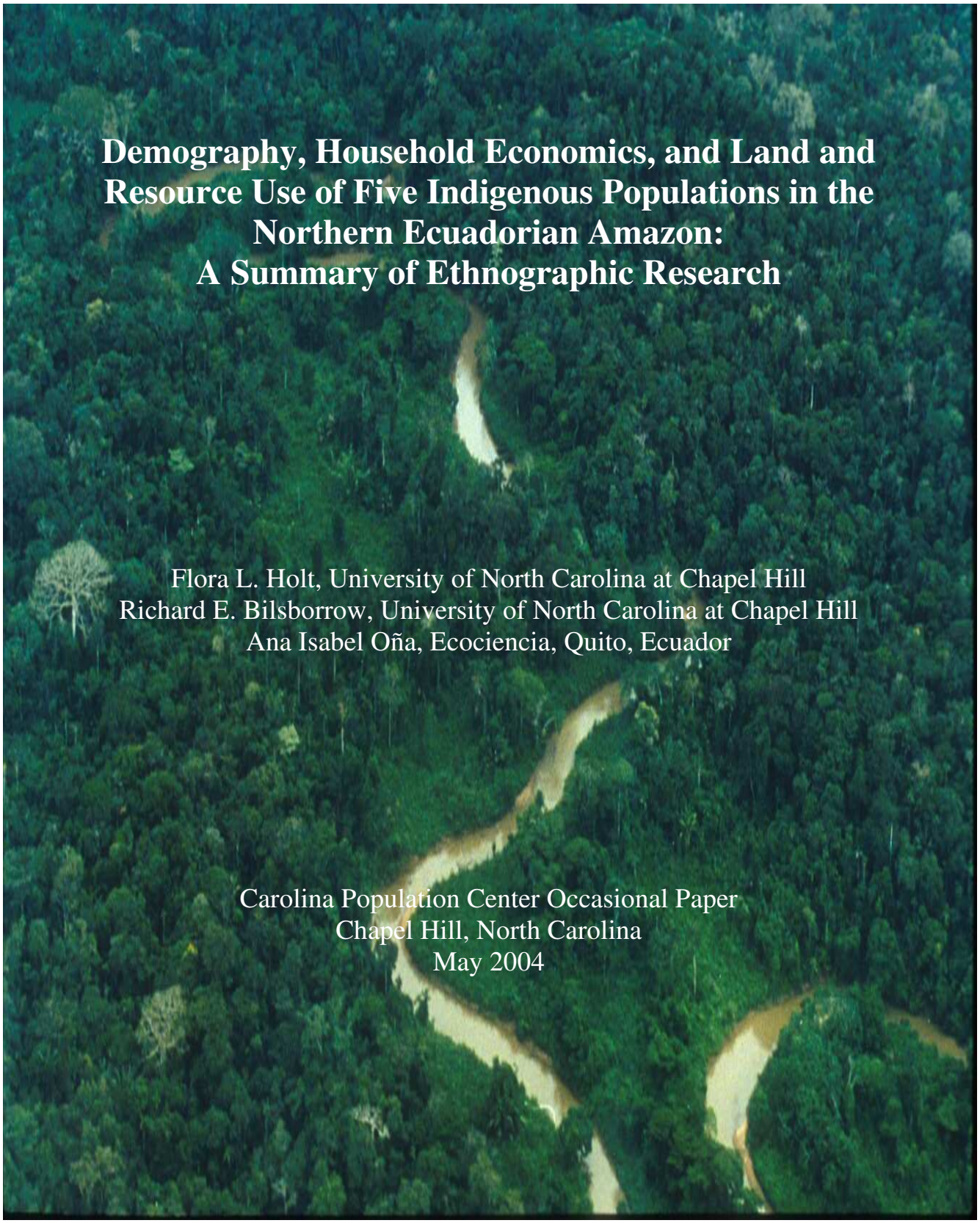

Demography, Household Economics, and Land and Resource Use of Five Indigenous Populations in the Northern Ecuadorian Amazon: A Summary of Ethnographic Research

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PREFACE

We are delighted to present the following document, "Demography, Household Economics, Land and Resource Use of Five Indigenous Populations of the Northern Ecuadorian Amazon: A Summary of Ethnographic Research." This is one of the first papers to come out of the National Institutes of Health-sponsored project, "A Comparison of Colonist and Indigenous Amazonian Land Use," a three-year grant (2000-2003) awarded to the Carolina Population Center at the University of North Carolina at Chapel Hill.

Based on a five-month intensive ethnographic study, this working paper describes demographic patterns, agricultural production and resource use, household economics, and socio-economic attitudes for eight study communities belonging to the Huaorani, Secoya, Shuar, Quichua and Cofán ethnic groups. We highlight the inter- and intra-ethnic diversity and cultural dynamism which exists among these groups, who, along with other Native Amazonian populations, are often perceived as homogeneous and static. Although these ethnic groups span the gamut in terms of factors such as population size, territorial base, and degree of market integration, they all face similar challenges such as land circumscription by alternative land users and uses (e.g., petroleum extraction), population growth, environmental degradation and greater use pressure on floral and faunal resources. Indigenous peoples throughout the Amazon and around the world are facing similar issues as they transition to an increasingly "globalized" and "modernized" society. Documenting this process of rapid cultural, demographic, ecological, and economic change is important precisely because of the dramatic pace of these changes, the shrinking window of opportunity to learn how things worked while some groups were still relatively subsistence-based.

We would like to express our appreciation to the Carolina Population Center for its role in publishing and disseminating this working paper. The Carolina Population Center (CPC) is dedicated to promoting research and training about demographic issues. One focus of the Center is the complex relationship between human populations and the natural environment; for instance how demographic processes impact resource and land use and is in turn affected by it. For more information, please go to http://www.cpc.unc.edu.

Flora L. Holt
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BACKGROUND ON THE PROJECT

Introduction

In early June, 2000, Bilsborrow and Holt began research on a project funded by a grant from the National Institutes of Health (NIH) entitled, "Comparison of Indigenous and Colonist Land Use in the Ecuadorian Amazon" (R01-HD38777-01, June 1, 2000-May 31, 2003). Since 1989, Bilsborrow has worked in the Ecuadorian Amazon region, or *Oriente*, undertaking demographic and economic research on migration and colonization. This research was based primarily on two large surveys of migrant farmer households in 1990 and 1999, the latter funded by NASA. Given the context of rapid deforestation and economic change in a ecologically renowned region, it is imperative to build on previous research to include a thorough investigation of the indigenous peoples inhabiting the *Oriente*. We decided to investigate the five main indigenous groups in the same northern Amazonian region as the NASA study—the Quichua, Shuar, Cofán, Secoya, and Huaorani—recognizing the diversity that exists both inter- and intra-ethnically within the indigenous populations. The purpose of the NIH proposal is then to collect comparable cross-cultural data on indigenous Amazonian populations, so as to compare and contrast their demographic and land use practices with those of colonists studied in a previous project. This will lead to a broader, regional understanding of the forces contributing to deforestation in the northern *Oriente*. A main objective of the NIH study is to determine the demographic, socio-economic, and biophysical factors influencing land use by indigenous populations in Ecuador's Amazon, and then to compare the findings with the results of previous research on the migrant colonist populations.

This requires a collaborative multi-disciplinary and multi-institutional approach. Our methodological approach uses both quantitative and qualitative methodologies from demography, landscape ecology, and anthropology. Data collection, carried out in 2001, involved two phases of fieldwork: (1) an ethnographic study in eight indigenous communities; and (2) household and community surveys in 28 additional communities (see Figure 1 for a map of all study communities). In addition, Global Positioning System (GPS) receivers were used in the field to obtain geographic coordinates of communities, households, and agricultural plots, and satellite imagery was processed to determine land cover types, land use patterns, landscape features, roads and other infrastructure. The geo-referenced socio-economic and demographic survey data and biophysical and remotely-sensed data are being integrated in a Geographic Information System (GIS) to derive measures of land cover and to use for multivariate analyses and spatial analysis at the landscape level.

At the end of the research, for these indigenous populations, we expect to have an understanding of:

- demographic changes, including fertility and mortality, family planning, and migration patterns;

- household economics: household assets, involvement in market activities and earnings, subsistence activities (e.g., hunting and fishing), sharing and exchange, consumption patterns and aspirations;
- land use and agricultural practices: forest cover and clearing, plot sizes and location, gardening practices and agricultural production, use of external inputs, raising of domestic animals, labor inputs and time allocation;
- social organization of land and resources: common property, private property, rules and sanctions, the social relations of land;
- location of key infrastructure (e.g., towns, roads, health clinics, markets) in the community and throughout the region, and how this relates to all the factors above.

This working paper is a first step toward bringing together preliminary results pursuant to the search for understanding the demographic and economic behavior of the five ethnic populations. We first summarize the methods and data of the ethnographic study, Phase I of the NIH field research. After a discussion of the methodological approaches used in this five-month study (note that the time allocation methods and results are the subject of a separate paper), we give ethnographic sketches of each ethnic group, based on the information collected by the ethnographers from households in the eight communities. These sketches thus draw mostly upon the qualitative participant observation and formal interview data, but also incorporate some of the quantitative demographic and household economic data. The data and findings of the household and community surveys of Phase II are not discussed here and will be the topic of future papers.

Data Collection Methodology

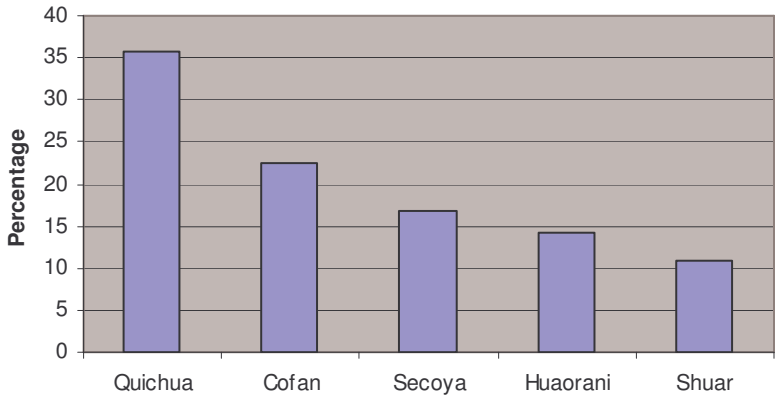
The first phase of the NIH data collection, and the focus of this paper, was an ethnographic study implemented from February to June, 2001. Ethnographic researchers were trained and placed in eight indigenous communities for this five month period (see Table 1). The original plan involved six villages (12 ethnographers, six men, six women, with a pair assigned to each community), but two communities selected had split prior to the study. Thus in the case of Pastaza Central/Pachacutik and Quehueiri-ono/Huentaro, the communities are linked, the latter having split off from the former in each case, but a high degree of contact continued after the split. Given the resulting small population size of each of these split village pairs, the ethnographic team was also split, one person assigned to each, although meeting as a team regularly. In the case of Pachacutik, the original field worker withdrew after the first three months and was replaced. Given the much larger size of the Quichua population in the Amazon, our sample included two Quichua villages (which became three, counting the split villages), along with one village each for the Shuar, Secoya, Cofán, and Huaorani (the equivalent of one village, which had splintered). The total number of households studied was 120 (although data are not complete for all households), with

677 individuals (Figure 2). Ethnographic data collection focused on (1) demographics, (2) agricultural production and resource use, (3) household economics, and (4) socio-economic attitudes and values.

Table 1: Sample of Communities for Ethnographic Study

Community	Ethnicity	Ethnographers	No. of Households	Percentage
Pastaza Central	Quichua	José Fierro	10	8.3%
Pachacutik	Quichua	Karen Andrade (Martha Coronel)	11	9.2%
Sewaya	Secoya	Cooper Bernal, Beatriz Morales	20	16.7%
Zábalo	Cofán	Victoria Salinas, Diego Yela	27	22.5%
Pilchi	Quichua	Katie Glaser, Patricio Saravia	22	18.3%
Tiguano	Shuar	Kati Álvarez, David Chávez	13	10.8%
Quehueiri-ono	Huaorani	Eliecer Álvarez	10	8.3%
Huentaro	Huaorani	Gladis Aguirre	7	5.8%
		TOTAL =	120	100.0%

Figure 2: Distribution of Households by Ethnic Group



Demographics

One of the first tasks assigned to each team of ethnographers once they settled in their community was to draw a map of the community and conduct a census of community members, ascertaining the names, sexes, and ages of all members of each household, the relationship to the (usually male) head, education level, and language(s) spoken. They also asked if each person was born in the community, and if not, at what age he/she arrived. Women (over age 15) were asked the number of live births they have had, the number of surviving offspring, and the date of last live birth (the three so-called Brass

questions—see Brass & Coale 1968). These data were obtained for all 120 households in the ethnographic sample.

In April 2001, the ethnographers implemented a formal demographic questionnaire with heads of households and spouses. It covered marriage, kinship, adult mortality, fertility, breast-feeding, use of contraceptives, religion, and migration. As with all the formal questionnaires in this phase of research, each question or set of closely related questions was identified with a numeric code, and investigators wrote down responses in notebooks using this code. Of the 120 households comprising the ethnographic sample, 85 households completed the demographic questionnaire. The main reasons for the missing households are absence from the community, unwillingness to participate, or inaccessibility.

Agricultural Production and Resource Use

Agricultural production and resource use were examined through a multitude of approaches. In March 2001, ethnographers implemented an intensive, structured agricultural questionnaire, matched with on-site visits to plots and direct measurements of agricultural plot (*chacra*) location and area using global positioning system units. The GPS points are being integrated into a GIS. For each household, researchers drew a picture of its property, showing the location of the house, all agricultural plots, and social and natural boundaries (e.g., neighbor's plot, river, national park boundary, etc.). Then, for each plot pertaining to a household, investigators ascertained its current and former crop composition, age of *chacra*, reason for selection of that site for planting, and future plans for the plot (e.g., duration of current active cultivation, plans for duration and use for collection and garden hunting during fallow, and plans for future active cultivation). Following this *chacra*-specific inquiry, the agricultural interview turned to more general topics, such as: the annual agricultural calendar (tasks, timing, tools used, and participants); selection of soils; agricultural pests and disasters; labor inputs; use of external inputs such as fertilizer or pesticides; involvement in cash cropping, marketing, prices and earnings from sales; raising and use of domestic animals; land subdivision and inheritance practices; changes over time in plot size, crop composition, and fallow practices; and intergenerational commitments to agriculture. Ethnographers completed agricultural questionnaires for 89 households, together with GPS on-site measurements of *chacras*.

In addition to the household-level agricultural questionnaire, ethnographers sat down with a community leader and other residents to conduct a community questionnaire, which covered topics such as political leadership and political practices in the community, communal work days or *mingas*, conflict resolution, social relations of property, community facilities, and relationships with oil companies and other outsiders. Questions about agriculture were asked in this interview as well, such as the main crops, selection of sites for agricultural plots, fallow practices, and land ownership and transfers.

For many indigenous peoples in the *Oriente*, agricultural foods provide the bulk of the diet and the carbohydrates, but hunting and fishing supply needed protein and the gathering of forest products supplements the diet with vitamins and nutrients (as well as construction materials, medicinal plants, and raw materials for handicrafts). The longest of the formal questionnaires dealt with resource use (i.e., hunting, fishing, and gathering). For the hunting portion, men were asked about the following: hunting participants (sex and age); size of hunting party; tools used, including the manufacture, cost and maintenance of tools; choice and abundance of prey, and hunting/eating taboos; frequency and success of hunting; sale of meat and/or live animals; location of hunts and use of trails; frequency and characteristics of night hunting; and use of dogs.

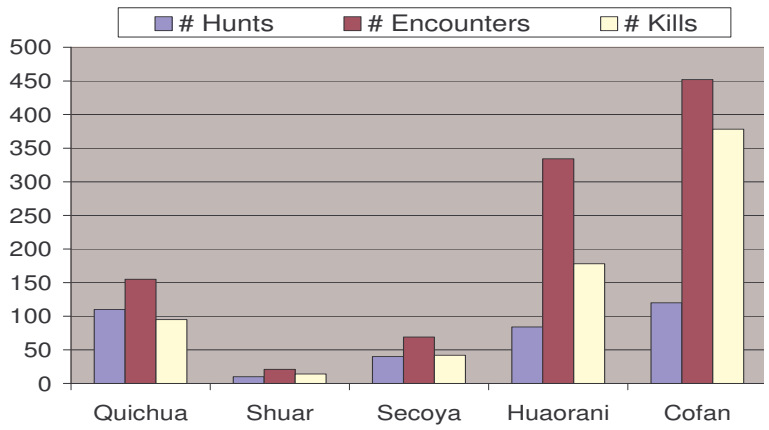
A shortened version of the male hunting questionnaire was applied to ascertain women's participation in hunting: frequency, prey and procurement technology, and yields. In contrast, the fishing questionnaire was not applied in a gender-specific manner. Informants were asked about the different methods used for fishing, participants, yields, time needed, and seasonality, in addition to the names and abundance of important fish species. The forest gathering portion began with questions about the cutting of trees and sale of wood, important tree species and their abundance, and tool use (i.e., possession of chainsaws). Then informants were asked to list the most important non-timber forest products they gather, the uses of the plants, the changes in their abundance, and the possibility of being replaced by purchased products. In total, 80 interviews were completed on resource use.

At the level of both the household and community, people were asked about the existence of rules governing resource extraction, such as limits on the number of game taken, types of fishing methods (including dynamite and *barbasco*, a plant-derived poison used for fishing), extraction of valuable hardwoods for sale, and the ways in which gathered forest products are harvested (e.g., felling whole trees to collect fruit). These questions are linked to others about perceptions of development and conservation, consumption aspirations, and hopes for the future, which will be discussed more below.

In addition to the interview based on the questionnaire, three data sheets were used to further investigate resource use. One ascertained the seasonality of climate, important fish and game species, and plant resources. Another asked informants to list food items, giving both Spanish and indigenous names, how each item is obtained, what part is consumed, how it is processed or cooked, when it is eaten and by whom. Third, to collect data about hunting patterns during the field research, a post-hunt data form was developed which ascertained: hunter, ethnicity, date, time left and returned, tools used, and other participants in the hunt (people and dogs). Then for each animal encountered, investigators asked for the Spanish and indigenous name, type of animal (bird, mammal, etc.), distance from the community where it was encountered, whether it was pursued and for how long, if it was killed, the age and sex of the kill, and the procurement technology. A space on the form collected the equivalent information for animals killed

using traps. In total, 364 post-hunt interviews were carried out in the eight indigenous communities (Pastaza Central = 45, Pachacutik = 46, Sewaya = 40, Zábalo = 120, Pilchi = 19, Tiguano = 10, Quehueiri-ono = 25, Huentaro = 59), involving 1148 animal encounters. For 1031 of those animal encounters, we have data on whether the animal was killed or not, which is the dataset we use in Figure 3 for the distribution of the hunting data by ethnicity. (Please see the concluding section of this manuscript for an inter-ethnic summary of the hunting data).

Figure 3: Number of Hunting Excursions, Animals Encountered, and Animals Killed, by Ethnicity



Household Economics

To investigate household economics, interviews were conducted to ascertain wage labor history and participation in the market economy, separately for men and women. Informants were asked about involvement in wage labor, sale of crops, sale of animals (both meat and live), and the making and sale of handicrafts. For women, questions were also asked about the acceptability of market activities for women, notably activities that involve travel outside the community. Heads of households were asked about children's labor activities and contributions, and whether parents want their children to earn money (beginning at what age, doing what, etc.). To learn about inter-household exchange, questions were asked about sharing of food, non-food items, and labor. In total, 78 interviews were implemented on household economics.

For more quantitative data about the household economy, we developed an "Input/Output Household Diary" data sheet (*Diario de Ingresos/Egresos*) to daily and systematically record all goods and services consumed by, or flowing into or out of, households, with the sources, quantities, and rates of exchange. Households were asked to keep daily diaries recording any income or other household receipts

(e.g., gifts) by source (person, institution) and category, as well as expenditures. Inputs included: game, fish, or plant (including agricultural) items collected; income from the sale of crops, game, domestic animals, or handicrafts; items received in exchange for labor; and gifts from other households or outsiders. Outputs included: cash outlays for the purchase of food and drink, household items, personal items, medicine, and agricultural inputs; materials or foods given to another household; payment (in food or money) to others for their labor; and money spent on travel or recreation. To ascertain dietary intake, a short checklist was included whereby items consumed by the household that day were noted as general categories, without reference to quantity. The food categories included in this dietary checklist were: forest game, domestic or purchased meat, fish, dairy, eggs, insects, legumes, grains and manioc, fruits, vegetables, nuts and seeds.

A person in each household interested in filling in the diary was trained by our ethnographers on how to complete the form. The ethnographers collected completed forms and dropped off blank ones every few days, and checked the data for consistency and reliability. In total, for the eight communities, 89 of the 120 households (74%) participated in the household economic diary methodology, and 4041 household-days of "input-output" sheets were completed (see Table 2 for the distribution of data by community and ethnic group).

Table 2: Distribution of Input/Output Data by Indigenous Community and Ethnicity

Community	**Frequency**	**Percentage**
Pastaza Central	598	14.8
Pachacutik	355	8.8
Sewaya	410	10.1
Zábalo	448	11.1
Pilchi	705	17.4
Tiguano	413	10.2
Quehueiri-ono	663	16.4
Huentaro	449	11.1
Ethnic Group	**Frequency**	**Percentage**
Quichua	1658	41.0
Huaorani	1112	27.5
Secoya	410	10.1
Cofán	448	11.1
Shuar	413	10.2
TOTAL	**4041**	**100.0**

Socio-economic Attitudes and Values

Finally, socio-economic attitudes were solicited by asking male and female respondents about their consumption aspirations, migration intentions, hopes for their children, and assessment and comparison of past and current quality of life. In the agricultural questionnaire, residents were asked about what crops they would like to cultivate for selling in the market, and if they think their children will have sufficient land to support themselves in the future. In the household economics questionnaire, a series of questions were asked about people's aspirations; what they would like to buy for themselves, their family, and their home; if they would like their sons and daughters to remain in the community/*Oriente*; and what occupations they would like their children to have. Broader questions about their quality of life were asked, such as if their lives now are better than in the past, and if they would prefer to live in a rural or urban area. To assess how entrance into the market economy is affecting resource use, people were asked whether they would continue to hunt and fish if they could purchase all their food. The hunting, fishing, and gathering questionnaire followed up on this line of questioning and asked hunters if they had sufficient funds to purchase ammunition for firearms, would they still hunt with traditional tools? This formal questionnaire also has a section dealing with conservation and development, which touches upon many issues of people's aspirations and perceptions. They were asked what "development" means, what things it includes (goods and services), and whether having these things leads to a better life. They were then asked what constitutes a healthy forest, what are the advantages and disadvantages to maintaining forest versus having markets and roads. After listing the pluses and minuses, people were asked to choose which they would rather have—forest or roads/markets—for themselves, for their families, for the present and the future. For the section on conservation, people were asked to define "conservation," and then to indicate if it is important, and if so, why. They were then asked whether their children will have the same natural resources they currently have (or whether these resources will disappear), and how their children's lifestyles will be different in the future. Lastly, residents were asked about contamination on their lands, and the environmental impacts and other effects of outsiders (e.g., loggers, oil companies, missionaries, tourists, researchers).

In addition to the various written questionnaires, participant observation and life history interviews attempted to capture the experiences, cultural values and personal emotions of residents. Much of people's desires or aspirations are expressed outside of the formal interviews, in the context of daily conversation. Ethnographers, therefore, sometimes participated in agricultural chores and social activities, and wrote about these experiences daily in their field journals, paying special attention to certain things: the desires of the younger generation; what people feel they lack in their community or home; aspirations for infrastructural development or access to markets; views about money and its value; and perceptions of outsiders and of Western culture. In each community, ethnographers conducted life

history interviews with a handful of the residents, generally older individuals. These open-ended, unstructured, informal interviews allowed people to reflect on their lives, recall important moments, and comment on changes they observed during their lives. Apart from giving information about migration, mobility patterns, and work histories, these interviews created a space for the sharing of emotions and aspirations.

To summarize, the ethnographic data provide a detailed look at household size and composition, land holdings and agricultural production, household economics, cultural values, socio-economic aspirations, and access to roads and market towns for eight indigenous communities. The information will allow us to investigate the factors contributing to human impacts on the natural environment, elucidating characteristics that can promote or undermine conservation in the Amazon. The ethnographic study, providing a depth of information, also was used to inform the design of the household and community survey, the second phase of NIH data collection (not discussed here) which gives us a breadth of data.

General Characteristics of the Study Population

The demographic census provides the basic data on the indigenous populations of eight communities, encompassing 120 households and 677 individuals (Table 3). The largest community is the Cofán community of Zábalo (19.6%), followed by the Quichua community of Pilchi (19.4%). For the sample communities, the average number of persons per household is 5.6, with males comprising a mean of the means for each community of 53% (minimum 44% in Pastaza Central and maximum 58% in Pachacutik, two sister communities).[1]

Table 3: Number of Persons per Community and Average Number of Persons per Household

Community	No. Persons	Percentage of Sample	Percent Male	Average Household Size (Persons)
Zábalo	133	19.6%	56%	4.9
Pilchi	131	19.4%	57%	6.0
Sewaya	97	14.3%	52%	4.9
Pachacutik	79	11.7%	58%	7.2
Tiguano	70	10.3%	54%	5.4
Quehueiri-ono	67	9.9%	54%	6.7
Pastaza Central	57	8.4%	44%	5.7
Huentaro	43	6.4%	49%	6.1
TOTAL	677	100.0%		5.6

[1] It is notable that mean household size is lowest in Zabalo and Sewaya (4.9), which is consistent with the results of estimates of fertility based on the full project data set from all 36 communities of the five ethnic groups (Bilsborrow et al. forthcoming).

In terms of age distribution (Table 4), the study populations are young, with about half the individuals in each community age 14 or younger (maximum 56% in Tiguano and Huentaro, minimum 45% in Sewaya). For persons who have finished their formal schooling (no longer attending), about half (48%) did not complete primary school, a quarter just did (24.4%), an eighth had no formal schooling, and nearly another eighth (11.4%) did not finish secondary school. Only 3.5% have completed secondary school. These levels of education are far lower than for the population at large in Ecuador or even the rural population or the colonist population living in the same Amazon region.

Table 4: Age Distribution by Community and Ethnic Group

Community	**Percent age 0-14 yrs.**	**Percent age 15-59**	**Percent age 60+**
Zábalo	49%	46%	5%
Pilchi	54%	44%	2%
Sewaya	45%	50%	5%
Pachacutik	53%	47%	0%
Tiguano	56%	43%	1%
Quehueiri-ono	55%	42%	3%
Pastaza Central	46%	54%	0%
Huentaro	56%	37%	7%
Ethnic Group	**Percent age 0-14 yrs.**	**Percent age 15-59**	**Percent age 60+**
Quichua	52%	47%	1%
Huaorani	55%	40%	5%

* Note: remaining ethnic groups not listed because only one community of each was sampled

When asked about their marital or civil status, most adults said they were married (43%), followed by single (30%) and "*union libre*" (21%)—couples without state recognition of their union, which is common in Ecuador. When asked if they were born in the community they are now living in, the majority (60%, N = 406) responded that they were not (Table 5). Of these, 27% moved to the present community in the decade of the 1980s, nearly half (46%) in the 1990s, and 16% just in the past year or so.

Table 5: Percentage of People Born in the Study Community, by Ethnic Group

Ethnic Group	**Born in the Community**		**Total**
	No	**Yes**	
Quichua	56.6%	43.4%	100.0%
Huaorani	67.3%	32.7%	100.0%
Secoya	48.5%	51.5%	100.0%
Cofán	67.7%	32.3%	100.0%
Shuar	62.9%	37.1%	100.0%
TOTAL	406	271	677
Percentage	60.0%	40.0%	100.0%

Women of reproductive age (ages 15-49, n=180) were asked various questions about their fertility and child-raising practices. First they were asked how many live births they have had (Table 6), and of those, how many are still alive. There is the usual pattern of older women having had more live births, with the relationships of adjoining five-year age groups consistently being what one would expect, even though the numbers of women in some (older) age groups are small, fewer than 10 cases. For women currently aged 20-24, virtually all have had a birth, while in the next age group over two-thirds (70%) have already had four to six live births. This indicates very high fertility in the twenties. But this high fertility continues well into the thirties, as nearly 2/3 of the women aged 35-39 have had at least 7 births. The data for women over age 50 are unreliable due to small numbers and, perhaps, problems of recall.

Table 6: Live Births by Age of Women

Age Groups	Live Births				Total
	None	1 - 3	4 - 6	7 +	
15 – 19	63.9%	36.1%			100.0%
20 – 24	6.5%	83.9%	9.7%		100.0%
25 – 29		30.0%	70.0%		100.0%
30 – 34	7.1%	21.4%	42.9%	28.6%	100.0%
35 – 39		9.1%	27.3%	63.6%	100.0%
40 – 44			22.2%	77.8%	100.0%
45 – 49			18.8%	81.3%	100.0%
50 +		27.8%	33.3%	38.9%	100.0%
Women	51	54	37	38	180
%	28.3%	30.0%	20.6%	21.2%	100.0%

Table 7 shows, for each community, mean live births and mean surviving births at the time of the study. In all but one community the average number of live births varies from 2.6 to 3.8, the exception being the Shuar community of Tiguano, with a mean of 5.2, which is extraordinarily high. The mean number of surviving births provides an indicator of infant and child mortality combined. The highest mortality appears to be in the Quichua community of Pastaza Central (proportion surviving of 0.71), and the lowest in its companion community, Pachacutik (proportion surviving of 0.94). All the other communities have proportions of 0.82 to 0.90[2].

[2] The numbers of women providing data in the various communities are all too small to draw any definitive inferences about levels of mortality or variations across communities from these data. This is easily seen with an example. Suppose in a community there are 100 persons, which will mean about 20 women aged 15-49. If the average number of births these women have had is as high as 4, then the total number of births is only 80. If infant and child mortality together add up to 200 per 1000 live births—not unreasonable for these populations living in the forest with little access to modern health care, though possibly on the high side—then the *total number* of dead children (up to age 5) is only 16. Evidently an

Table 7: Average Number of Live Births and Births Still Living, by Community

Community	Average Live Births	Average Surviving	Proportion Surviving
Pastaza Central	3.44	2.44	0.71
Pachacutik	3.82	3.59	0.94
Sewaya	2.61	2.32	0.89
Zábalo	3.37	3.03	0.90
Pilchi	3.79	3.21	0.85
Tiguano	5.19	4.25	0.82
Quehueiri-ono	3.83	3.39	0.89
Huentaro	3.46	2.92	0.84
Overall Averages	3.58	3.08	0.86

In the following sections, ethnographic sketches are provided for each of the five ethnic groups in this study. But first, an important caveat should be made—the communities studied in phase I of the field research cannot be said to be a random or representative sample of the ethnic populations of which they are a part. Indeed, it is questionable how much one can extrapolate the findings from one or two communities to indigenous groups which number from several hundred (e.g., the Secoya) to the tens of thousands (the Quichua and the Shuar). Although we may speak in generalities for convenience (e.g., "the Shuar do this, or the Huaorani believe that"), implicitly it should be understood that we are speaking about the Shuar of Tiguano, or the Huaorani of Huentaro and Quehueiri-ono, being further cognizant of the inter-household diversity that calls into question the homogeneity often assumed of a "community."

error in the data of one or two deaths, or simply statistical variability, will result in a significantly different proportion and therefore estimate of mortality.

THE QUICHUA

[Quichua mother and daughter in a community along the Napo River. Photo: Flora Holt]

The most numerous of the indigenous populations in Ecuador's Amazon, with around 60,000 people, the lowland Quichua, or Runa, are divided into two groups: the Napo Quichua and the Pastaza Quichua. The former group is located along the Napo, Aguarico, San Miguel, and Putumayo Rivers, in the urban areas in Napo and Sucumbios Provinces, and in Peru. The latter group is located in Pastaza Province, along the Curaray, Bombonaza, and Pastaza Rivers, and also in the urban areas of this province. Linguistically, they are all Quichua speakers, with a dialect different from that of the highland Quichua. Although the origin of the lowland Quichua is not completely clear, they emerged as a distinct ethnic group "when pre-existing indigenous societies were transformed by violence, social disruption, and depopulation from disease during the Spanish conquest" (Irvine 1987: 19). Thus while the conquistadors and missionaries in the 16th century reported many ethnic groups and languages in the Ecuadorian Amazon, these languages were in large part replaced by Quichua, used as a *lingua franca*, within a century or two. The Quichua's long history of contact with outsiders makes them one of the most assimilated and adaptable of Ecuador's indigenous peoples. The description below is based on information from three Quichua communities: Pastaza Central and Pachacutik from Sucumbios Province, and Pilchi from Orellana Province (a total of 43 households, 267 individuals).

Quichua Demographics

Under demographics, for the Quichua and each of the other four ethnic populations, we will review age and sex distribution, where they were born or come form, marriage patterns and customs,

breastfeeding, fertility, use of family planning, education of men and women, religion, migration and mobility and contacts with towns.

As is generally the case with the ethnic groups sampled, the Quichua communities included in this study are a young population, with over half (53% of males and 52% of females) under the age of 15. The overall sex ratio is 1.2, or 20% more males than females. In Pilchi, 58% of residents were born in the community, compared with 47% in Pastaza Central, and only 16.5% in Pachacutik. Pastaza Central and Pachacutik are linked villages, the latter formed after splitting from Pastaza Central in early 2001. This explains why so few of Pachacutik's residents were born there. The Quichua's long exposure to the outside world is seen in their language patterns—there are no monolingual Quichua speakers. The vast majority speaks both Spanish and Quichua, while a handful are Spanish monolingual.

In terms of marriage patterns and fertility, the Quichua are monogamous. Of the 31 couples who responded to the question about their civil status, 16 are married, 14 are in a *union libre*, and one is separated. The men get married for the first time at an average age of 21, whereas for women the mean is far younger, 15 to 16. Many of these girls find that their husbands are chosen for them. In Pachacutik, for instance, when a female ethnographer asked women if their marriages were arranged, five out of six respondents said that they were.

When asked about breastfeeding practices, Quichua women (n=31) said that they breastfeed their infants from a year to a year and nine months. They begin to give their children supplemental foods such as manioc and plantain when they are between three and six months old. The majority of women thinks that breast milk is best, and would continue to breastfeed even if they had the money to buy formula.

When asked about contraceptives, most women had heard of them, but mainly only the natural, plant-derived versions (e.g., *chuchuaso*, *yahuarwasca*). It is highly unlikely that the women are using modern, Western-derived contraceptives. Opinions are divided about the acceptability of their use (a slight majority are against the use of any contraceptive). On the one hand, some women feel that contraceptives are not "natural," could even be harmful, and that they should not impede the arrival of children, who are considered a "gift that should be received." Other women acknowledge that children are expensive and hard to care for, and therefore they should try to avoid having too many children for whom to provide.

In terms of fertility, Quichua women from the three sampled villages have on average 3.7 live births. When women were asked how many children their mothers had, the mean reply is 8.7. (Not enough women knew how many children their grandmothers had to be able to do a similar calculation.) Further data are needed to investigate a possible inter-generational decline in fertility. Information on mortality is more imprecise: 16% of the 249 live births Quichua women sampled had had by the time of the interview did not survive. The numbers, however, are too small to draw any precise inferences about

mortality levels even taking into account the age distribution of women reporting. Regarding adult mortality, respondents were asked why their parents or grandparents died. The responses often included black magic or witchcraft, although some simply attributed deaths to illness or exposure to the cold temperatures in Quito. Other causes stated were tuberculosis, skin disease, cancer, and falling down stairs. It is apparent that many Quichua view witchcraft as the ultimate cause of adult mortality, and seem less concerned by proximate causes (specific diseases or accidents, for instance).

In terms of education, 63 males and 51 females who had finished schooling were surveyed to ascertain the highest level achieved. For males, 2 (3%) have no formal education, 16 (25%) did not complete primary school, 33 (52%) did but their education ended there. Nine males (14%) did not complete secondary school, but 3 (5%) did. For females, rates of formal education are lower: 5 (10%) have no formal education, 17 (33%) did not finish primary school, 23 (45%) did, and only 6 (12%) attempted secondary school, of which one person finished. Among the Quichua men and women interviewed, none had more than a secondary education. In these Quichua communities, children attend school on a regular basis for 5-7 hours/day, 5 days a week.

In terms of religion, almost all self-reported as religious, the vast majority identifying as Catholic, but there are a few evangelists, especially in the community of Pilchi. Only one person self-reported as not belonging to any religion. Although none of these communities has a church *per se*, religious services are sometimes held in the communal house or school. Not surprisingly, most views of the church are positive: missionaries and priests come to the villages to teach, give services, and in some cases offer distance learning. They are perceived as helping the village, sometimes through material gifts, but more often in terms of strengthening their commitment to God and people's sense of community.

Questions in the demographic interview also inquired about migration and mobility. Many Quichua of this sample are originally from other places in the northeastern *Oriente*, such as Puyo or Tena. When asked who had decided to move to the community to which they currently belong, almost all respondents state that men (mostly husbands, but also fathers and brothers) made the decision, perhaps illustrative of the power dynamics between the sexes in Quichua culture. Residents were also asked why people in their community moved away in the recent past. The most common reasons include conflict with other residents or marital conflict, the opportunity to pursue education or work, the allure of the cities, the desire to form other communities, or the inclination to be near roads. Most agree that migration out of the community is less than before. When people were asked why they remain, various reasons were given: their farm (*finca*) is there, there is work and food in the community, their children are in school, life is peaceful, they have nowhere else to go, and they are accustomed to their lives so to begin again would require too much sacrifice. Land is emphasized as the key reason they stay.

Residents were asked about their mobility, specifically why and how often they take trips. People from Pilchi go to Coca, Itaya and Pompeya from three to four times per month to once a year for market activities or to visit family. Those from Pastaza Central visit Shirys, Cascales, and Pachacutik two to twelve times per year to visit family members, shop, attend fiestas, or sometimes to take a course. Residents of Pachacutik report traveling away from the village only one to four times per year, mostly for meetings, visiting relatives, or shopping. Popular destinations include Antisuyo, Pastaza Central, Lago Agrio, Tena, and Cascales.

Quichua Social Organization

Among the Quichua, households are the basic unit of organization, followed by the community level, and then federations. Communities are led by a trustee (*síndico*), president, vice president, treasurer, secretary, and a board of directors (*vocales*). These positions are elected in December of each year by majority vote of the official adult members of the community (*socios*) in the presence of a representative of the federation to which the community belongs (FOKISE for Pastaza Central and Pachacutik, FCUNAE for Pilchi). Elected leaders are in charge of tasks such as organizing communal work days (*mingas*, discussed further below), mediating interactions with outsiders, and pursuing community improvements. *Mingas* are held generally once every week or every two weeks for various tasks, from cutting the grass around the school to constructing or repairing a communal dwelling. All community members are required to attend or to send a representative; failure to do so results in a fine (about $0.50 to $1). Typically, meetings of the community are held monthly, with additional emergency meetings as needed. The latter may be called when an outsiders show up (e.g., oil companies, researchers) or when there is a conflict to be resolved (informants state, however, that conflicts are usually minor, involving drunken hostilities or taking wood from someone else's land). To be a full-fledged member of the community (*socio*) requires the fulfillment of various criteria, including: having references, having land in the community, being over age 18, having a government-issued identification card (*cedula*), paying a modest entrance fee, and obtaining community approval. The main benefit of being a s*ocio* is the ability to leave land to offspring. In the three Quichua study communities, there are no *socios* of any ethnic group other that Quichua, although some residents are "mestizo Quichua," meaning of mixed Quichua and non-indigenous blood.

Property ownership among these Quichua involves a combination of private and common property. When asked about communal property, residents mentioned the school and center of the village (soccer field, etc.), the generator, solar panel, water system, *botiquín* or room with basic medical supplies, shed, communal house, wheelbarrow, shovel, and communal pots and dishes. Members can use these items whenever they want. There is some mention of common ownership of hunting lands, and a

communal *chacra*. In these Quichua communities, land is held in common, and is allocated to *socios* who have usufruct rights to an area and can bequeath these rights to children or share the land with other family members, as long as they continue to live in the community. However, no one can sell any of their land.

Quichua Household Economics

A discussion of household economics involves many aspects. We begin with the standard of living and dietary patterns, and then turn to a discussion of involvement in market activities and cultural values surrounding wage labor.

The Quichua communities studied, as of early 2001, did not have electricity. (This would change quickly, at least for Pilchi, where by the next summer some households would have generators, light bulbs and televisions). With no plumbing, human wastes are eliminated outdoors, in *campo abierto*, although a few households say they use a latrine. (Again, in Pilchi, some households living in the center of the village have a choice of using rudimentary toilets by the communal house—one flushes by pouring a bucket of water into the bowl afterwards, and the waste goes into a stream, untreated.) Water for drinking, bathing, and cooking comes from multiple sources such as a stream, river, rainfall, or a well. In the two Quichua communities in Sucumbios Province, well water is predominantly used, whereas in Pilchi, in Orellana Province, water is mostly taken from streams and the Napo River. Overall in these three communities, two-thirds of the households get their water from streams or rivers, which make them highly vulnerable to contamination from oil spills, runoff from agricultural chemicals, and human wastes.

The task of collecting water for the family does not fall solely on the shoulders of women; men and children also help. For the three Quichua communities, the water source was a median distance of only between two to five minutes away on foot, and the collection of water was done every few days (Pilchi) to four times per day (Pastaza Central). For fuel, households in Pachacutik and Pastaza Central use only wood, whereas the majority of Pilchi residents use propane gas as well as wood. Men seem to fetch firewood as much as women, the wood usually coming from the household's own *finca*, being a median distance away of 30 minutes. However, responses vary widely regarding the frequency of wood collection: once per day, to every two weeks; the median value for the three Quichua villages was twice a week.

What do the Quichua of the sample communities eat? A dietary checklist was provided to each household along with the household input/output diary form to record what types of food were consumed each day. In the three communities, a total of 1,658 household-days were recorded. The results of this checklist (filled out daily by willing households) inform us that the Quichua still predominantly rely on protein from the forest and rivers: Quichua participants reported consuming game on 39% of the recorded

days and fish on 57% of the days, whereas domestic animals and purchased meat are part of the diet on only 17% of the days (eggs, however, are eaten on 25% of the household-days). The importance of the forest is also expressed by stated preferences: people's favorite foods are hunted game, such as paca (*guanta*), armadillo, Cracid birds (e.g., *perdiz*), and fish. The other main contributors to the Quichua diet are grains and manioc (consumed 71% of the days) and fruit (82% of the days), predominantly plantains and bananas. Again, expressed preferences echo this finding: people state that what they want to eat every day is meat and fish, *chicha* (fermented drink made from premasticated manioc and other crops that is a culturally important food for many indigenous peoples of the *Oriente*), and some carbohydrate (rice, manioc or bread). Legumes and insects are each consumed on fewer than 20% of the days, and dairy foods, nuts and seeds on less than 10%.

Families generally eat two to three times per day, but sometimes only one meal if there is not much food. Going to bed hungry is not uncommon, and most households have experienced it because they ran out of food, were traveling, etc. Another type of dietary hardship results from the absence of the male head of household (e.g., due to wage labor away from the community). When women were asked how their diet changed in such circumstances, they said that they eat less meat. Fortunate households will have other relatives (e.g., fathers, brothers) who share meat with the family whose male head of household is absent, while other women and children will eat more garden produce, drink more *chicha*, or spend more time fishing. Between households, hunted and fished (and to a lesser extent, gardened) foods are most often shared, especially after successful excursions into the forest or rivers. These inter-household resource transfers are spontaneous, and occur mostly between kin and neighbors. For example, sharing between parents and offspring maintaining separate households happens about once or twice a week in Pastaza Central.

All of the households surveyed purchase foods from the market, in nearby colonist towns such as Cascales, Los Angeles, Itaya, Pompeya, Coca, and Lago Agrio. The most common items purchased are rice, noodles, sugar, oil or lard, tuna, salt and other condiments, and vegetables such as potatoes, tomatoes, onion, and beans. When asked why they purchase these foods, most mention flavor, variety, nutrition, children's desires, and a lack of time to hunt. Most purchase food monthly or bimonthly, but a few households go to the market only every few months. Women were asked if they would prefer a diet of all purchased foods if they could afford it. Most responded that they are amenable to living on purchased foods, although a few mentioned that they would still supplement the diet with fresh fish. In Pilchi, for example, many women stated that their husbands already do not hunt or fish very often. Given the earlier responses above indicating preferences for forest game and fish, these responses seem contradictory, but that is only until the dwindling game supply is taken into account. According to the

women interviewed, hunting is now too time-consuming, so the returns do not justify the time and effort; it is better that their husbands engage in wage labor and buy food, a more reliable way to feed the family.

When Quichua men were asked what opportunities exist in wage labor, the most common reply is working for the oil company, but tourism, work in the service industry (e.g., waiter), building roads, and agricultural work as a *jornalero* are also mentioned. We collected work histories for 28 men. Of them, 14% have never engaged in wage work, earning money in other ways, such as the sale of cash crops. Of the men who did do wage work, 21% (n = 6) have never been employed by the oil company, working instead as waiters or in tourism as guides, porters, or canoe drivers (for Selva Lodge, Sacha Lodge, and Yuturi tour company). Thus, the majority (18 of 28 or almost two-thirds) have worked for an oil company. It is not uncommon for men to have worked for two or three different companies, such as Occidental Petroleum, Western, Standard Oil, CGG (Compagnie Generale de Geophysique), Seiscomdelta, and Geosur. The work is mostly menial, such as carrying cables, cutting down trees with machetes, cleaning up oil spills, and installing pipelines. It is also temporary, lasting from a month to six months. To illustrate wage levels, in Pilchi at the time of the study, five men were working in tourism for Sacha Lodge and Selva Lodge, earning $50-145/month, while another was driving a canoe for CGG and earning $120/month.

When women (n=31) were asked about the possibilities for wage labor, they mentioned jobs like domestic help, nannies, cooks, secretaries, and waitresses. Around 30% of the women in each community had worked in wage labor at some time, and patterns of work experience were very similar. As young girls in their early teens (from 10 to 17 years old), they worked in towns or cities like Quito, Coca, Cascales, and Nueva Rocafuerte. Many were domestic helpers or maids, a few washed clothes, one was a waitress, and one tended cattle. Most left the work when they got married. At the time of the study, none of the women surveyed in the three communities were engaged in wage labor.

In terms of work that allows residents to stay in their community, agriculture is one of the most important among the Quichua. We asked about cash cropping activities in the previous year (2000) and found that approximately 80% of the households were involved in the sale of agricultural products, all selling to middlemen in nearby towns, such as Cascales or Lumbaqui for the northern two Quichua communities, and Coca, Pompeya, or Itaya in the case of Pilchi. The range of crops sold varied by community: in Pachacutik, almost all households sold corn, about half sold coffee and naranjilla, and one sold cacao, earning $90-600 per year, with a median of $144. In Pastaza Central, all households sold coffee and corn, and some also sold manioc and plantains, resulting in incomes varying from $120 to $500 per year, with a median income of $308. In Pilchi, the main crops were corn, coffee, and some rice and cacao, with sales ranging from $10 to $300 per year, with a median of $105.

We also asked residents about the sale of fish and game. The sale of meat varied greatly, with some households having sold it that day whereas others said the last time was a few years ago. In the two communities in Sucumbios Province, almost all sample households engaged in the sale of meat in the previous year, earning $10 to $80. The most common animals sold were agouti, armadillo and a fish called *bocachico*. In the Orellana Province community of Pilchi, however, only a fifth of the households had sold any meat or fish in the last few years, animals such as Collared peccary, White lipped peccary, armadillo, and agouti, earning $6 to $30 annually. Half of the households who sell meat also sell live animals, including monkeys, parrots and other birds, rodents such as agouti and acouchy, and ocelots. All noted that there is less game available now, so it is more difficult to find and sell live animals compared to years past. However, with one informant reporting that parrots fetch up to $12 or $14 apiece, it is likely that people will continue to sell animals on the market as a supplementary form of income.

Timber and non-timber forest products are discussed in detail below in the section on resource use, but brief mention is appropriate here. Quichua households use a variety of tree species for firewood, house construction materials, building canoes, and to sell for cash. These species include *chuncho*, balsa, *caoba*, *sangre de gallina*, and *canelo*. In the Sucumbios communities, few households report selling timber, and no one in Pastaza Central even has a chain saw. In Pilchi, wood is sold by various families to tourist lodges and intermediaries, including cedar, balsa, *sangre de gallina*, *boyas* and *pechiche*, but the actual amounts could not be ascertained. In contrast, no non-timber forest products are sold in Pilchi, although it can be argued that materials used for handicrafts provide income.

Indeed, in many indigenous communities, handicrafts are an important source of income. This does not seem to be the case, however, for the three Quichua communities studied. Of 28 men who responded to questions about *artisanías*, only seven engage in this type of market activity. Three men in the Sucumbios communities make baskets, bags and fishing nets to sell in the community. In Pilchi, four men make bags, oars, and fans for sale in the Sacha Lodge. No one makes any significant amount of money from these activities, as they report earning only about $20 per year. One Pachacutik resident mentioned that he used to make more handicrafts, but the forest materials are disappearing. Making handicrafts for the market is not commonly done by Quichua women either: only eight of 28 women interviewed do it, making bags, hammocks, and a bit of pottery for sale in the community, in local towns like Cascales, and, in the case of Pilchi, for the local tourism lodge. Women earned approximately $5 to $35 from the sale of handicrafts in 2000. One woman said that she doesn't feel good about marketing handicrafts because she is not paid a fair price. Another explained how she earns less than before because there is less material available in the forest.

Another income-generating activity, presumably in the domain of women, is the sale of domestic animals. Almost all households have chickens (from a handful to about 40), but pigs, cows and horses are

very unusual. Only 40% of the households sell domestic animals, the majority raising them only for family consumption. From the sale of chickens, women in the two Sucumbios communities made $12 to $40 in 2000, selling mainly to other households, whereas women in Pilchi can sell animals to the tourism lodges as well, earning $30 to $60 annually. Activities such as *artesanías* and selling chickens are some of the few ways that women can earn their own money independently of their husbands.

Qualitative interviews with community members reveal that women's involvement in wage labor is not looked upon favorably. Most of the Quichua men surveyed do not feel it is acceptable for women to engage in wage labor. As one informant bluntly put it, "because it is a pretext to look for men." Few men gave reasons for their opinions, but those who did cited pregnancy by and marriage to men outside the community as the main reason for their views. Very few wives or daughters of male informants were reported as having ever engaged in wage labor, in contrast to women's responses of their wage labor history, reported earlier, where approximately 30% of women in the three villages had worked for income outside the community at some point in their lives. Some men and women said that it is more acceptable for a woman to leave the community to study than to work. When women were asked the same question about the acceptability of women working away from the community, most replied, as did the men, "not at all acceptable." Women should be in the community, at home. Some said that Quichua culture dictates that parents are strict with daughters, who should leave the household only when married.

Since the cultural acceptability of men engaging in outside wage labor is widespread, women were instead asked if they want their husbands to engage in such activities. About 60% of 28 total respondents said yes, eight women said no, and three did not respond. Those who said yes commented that it is necessary to support the family: to buy clothes, food, and household items; to be able to travel; to afford to educate their children; to pay hospital bills; and to make outside contacts. Those who said no often did not give a specific reason, just that the husband should be home with the family or simply that she wants him at home.

Quichua Agricultural Patterns

Agricultural plots, or *chacras*, are central to the Quichua way of life and culture (Irvine 1987). Here the general patterns of swidden agriculture are described (including crop selection, fallow practices, and soil preferences), followed by a discussion of use of external inputs, labor practices and inputs, domestic animals, and perceptions about adequacy of arable land.

The three Quichua communities sampled all have the same main crops: manioc, plantain, coffee and corn. The former two are principally for subsistence while the latter two are mostly for market sale. But there are slight inter-community differences in the proportion of agricultural plots dedicated to each crop. In Pachacutik (where the mean number of gardens per household is 3.6), plantains appear to be the

most prevalent—all but 25% of the gardens have some plantains, while half have manioc and only a third have either coffee or corn. In Pastaza Central (where mean gardens per household is 4), all gardens have coffee except for 25%, half the gardens do not have plantains, and 75% of the gardens do not have corn or manioc. In Pilchi, the number of garden plots was not ascertained, but the different crops that households cultivated were recorded. Only one of 18 households surveyed did not plant manioc; only one did not plant coffee; three did not plant plantains, and ten did not have corn. Thus, in sum, in Pachacutik, plantains are most important, in Pastaza Central coffee, and in Pilchi, manioc and coffee. In Pachacutik, about 20% of the gardens are reported as having a secondary crop of onions, guineo (banana), naranjilla, peach palm, guava, or grapes, and a couple of plots are said to have pasture. In Pastaza Central, one notable finding is that each household has at least one garden dedicated *solely* to cash crops (i.e., coffee or corn). Also, only two of the five households surveyed have gardens that can be considered diverse, with the presence of at least one secondary crop such as pineapple, guava, sugarcane, sweet potatoes, potatoes, peach palm, or oranges. (Unfortunately, respondents in Pilchi did not answer in terms of individual plot crop composition, so we cannot discuss these aspects for Pilchi.) In Pilchi, secondary crops include rice, fruit trees, sugarcane, pineapple, guanabana, peach palm, and grapes.

Studies of Native Amazonian agricultural practices (e.g., Irvine 1987) emphasize that after a garden plot falls out of active cultivation and is said to be in fallow, the area is commonly not abandoned but continues to provide sustenance in terms of plant foods and by acting as a magnet for game. However, Irvine's study was done among the Runa of San José de Payamino in the mid-1980s, and we did not find among our Quichua study communities the same emphasis on fallow use. The median fallow period for all three Quichua communities was 2.5 years. In Pachacutik, *chacras* are actively used for about three years before they are left fallow for one to two years. In terms of post-cultivation use, some people say that their gardens are used for pasture, coffee, or plantains, but most say they do not continue to use the garden at all after it falls out of active cultivation. In Pastaza Central, we found that post-cultivation plot use depends on whether or not the *chacras* were dedicated to cash crops. If a plot was dedicated to subsistence crops, residents continue to harvest fruits such as plantain, bananas, and papaya from the fallow chacras, but in plots with cash crops, post-cultivation use is "none." Interestingly, neither community mentioned hunting as a significant post-cultivation activity. In Pilchi, fallow times appear shorter, with about half of the respondents saying that cultivation areas are usually used again within a year or even less. During the fallow periods in Pilchi, however, hunting does take place, as well as the collection of plantains, peach palm fruit, and other fruit from fruit trees. Still, half the households do not use their gardens following cultivation.

In terms of soil selection, black or brown, flat, well-draining (non-clay), sandy and non-floodable areas are generally considered fertile and desirable, while reddish and rocky soils are considered poor.

People say that manioc, plantain, bananas, and corn need good soils. Garden size is said to depend on a variety of factors: household size, labor availability, length of time in community (e.g., recent arrivals have smaller gardens, other things being equal), or misfortune. Gardens can be plagued by a variety of misfortunes, due to the appetites of rodents, birds, and insects as well as floods, strong winds, plant diseases, and petroleum contamination. Gardens experiencing these problems are reduced in size. There is no clear trend observed in (1) agricultural misfortunes, or (2) towards larger or smaller gardens over time among these communities.

Besides changes in garden size, residents were asked about changes in crop selection. Most replied that crop selection (especially the focus on manioc and plantains) is the same as ten years ago, though there is now more corn, as well as some rice, which was nonexistent before. Overall, respondents in some households said they would like to plant more corn, rice, beans, peanuts, naranjilla, fruit trees, cacao and cucumbers because of their market value, while other households did not seem interested in new crops. A trend towards more agricultural production for the market probably signifies a concomitant increase in the use of external inputs, of not only seeds from the outside but also chemicals. Only one household in Pachacutik currently uses chemical inputs (for naranjilla), and none in Pilchi do. In Pastaza Central, however, all of the households interviewed report such use: pesticides such as Furadan are sprayed to fight the *arriera* ant which affects coffee. These informants say that as a result, the ants are killed and the crops are better, denying that there are any other (potentially undesirable) effects because they use only a small quantity. About half say that they are using more pesticides than before, and the remainder of the chemical input users says that their use has declined. Fumigating plants is considered a task of men.

In the rainforest environment, the labor that goes into creating and maintaining an agricultural plot does not follow as strict a seasonal calendar as places with dramatic seasonal changes in precipitation and temperature. A *chacra* can be cleared and planted at any time of the year. After planting, weeding (every three months for manioc, two to five times annually for plantains), and harvesting (using tools such as a machete, ax, digging stick, and sometimes a chainsaw) follow. Both sexes are involved in each task, although the clearing of large trees (and application of chemicals) is done by males. In such a wet environment, the Quichua do not follow a "slash-and-burn" procedure, but instead a "slash-and-mulch" one. Irvine (1987) documents Quichua swidden management in detail.

Agricultural tasks are carried out mainly by members of the household, but when extra labor is needed, the Quichua rely on *prestamanos* and *mingas*. *Prestamanos* are reciprocal labor exchanges, and *mingas* are days in which others in a community help a family in return for food and drink (without the expectation of reciprocity). These events most commonly occur when families need help with agricultural tasks, but also happen when assistance is needed for duties like house construction. As

mentioned earlier, *mingas* are held at the community level, but can be at the household level as well. In Pastaza Central, there is a strong reliance on *prestamanos*, as all households use this labor exchange about every fifteen days to weed (most common), clear and harvest. In Pachacutik, two-thirds of respondents use *prestamanos* one to five times annually to clear and harvest, while in Pilchi, three-quarters use it seven times per year. In Pastaza Central, *mingas* are not common, as only one household reported using a *minga*, and that was three years ago, to weed a garden. In Pachacutik, half the families interviewed (n=6) occasionally use *mingas* involving four to ten people to clear forest, while the other three households do not use them at all. In Pilchi, over half the households use *mingas* (all within the past year) to clear and plant, build houses, even to collect *paja toquilla* (palm fronds used as roofing material) to sell to local tourism lodges. Such *mingas* have two to twelve participants, averaging five. When asked about hiring wage laborers for agricultural tasks, no one in Pastaza Central (n= 5) does it but about a third (n=6) in Pachacutik and a quarter (five households) in Pilchi (n=18) do. The hired help are relatives, community members, or friends passing through, not outsiders such as colonists. Full days of labor are compensated for at the rate of $2 to $4 per day. There are indications from the interviews that these agricultural labor patterns have not changed much in recent years.

Part of the agricultural interview asked about the care of domestic animals. All households surveyed, with one exception, have chickens, from three to over forty. They are mainly for household consumption (as mentioned earlier in the household economics section). About a quarter of the households also own horses, which are used for transport of goods and people. Only a couple of households in the sample own cows, and only three households (all in Pilchi) have pigs. Domestic animals are becoming more prevalent, although a household's ownership of them fluctuates. A few informants reported that they used to have more domestic animals, but they were poisoned by others because of jealousy or they became sick and died. The interviews seem to indicate that ownership of domestic animals is a status symbol.

Does the next generation differ from the current one in terms of agricultural practices or perceptions? Some people have positive perceptions about the commitment the young have towards working the land, saying that there are no intergenerational differences ("when father and son work together, the son thinks the same as the father"), or that young people work harder to better their plots because of the example their parents set. The more common response, however, is more critical, and informants compare the younger to the older generation in the following way: young people do not spend the same time and effort in agriculture; they are not as knowledgeable; their parents are not as strict with them and they haven't learned; they do not work as hard and do not like to work in the *finca*; or they are not as careful as older people and let their gardens become overgrown. One informant feels that the

relationship the next generation has with the land is fundamentally different: "The elders converse with the plants, with the land. They worry about the land. The young only clear, plant and harvest."

Divergent opinions were also expressed when we asked respondents if they thought that in the future people would work farther away from their *chacras*, moving to other places. Some said they do not know, but they expect that people will continue to work together and stay on the land; perhaps people will cultivate other crops, but things will continue much as they are. Others believe, however, that people will leave to look for a better way of life because as economic conditions are insufficient in the community. In Pilchi, a community that has increasing contacts with the oil company Occidental Petroleum, many residents foresee a change of less reliance on agriculture and more on outside work. Respondents envision the youth as becoming more enamored with the companies. They will learn things from the outside, such as using a chainsaw, driving a motorized canoe, and being a mechanic. Most youth will leave, come back changed, and live differently in the future. They will not even want to speak Quichua. Because of the money earned in the oil company, residents predict, people will change and think differently. One man said, "People will become more knowledgeable and dependent on the outside, on companies. They will go to live in the cities, will change their way of life, but when the contract and the money end, they will return. But where will they end up?"

Quichua Resource Use and Conservation

This section summarizes findings about Quichua use and management of the forest and rivers. First, we describe hunting patterns, then game taboos, fishing, gathering, use of timber, and Quichua perceptions of resource scarcity and ideas about conservation.

Among these Quichua, boys begin to hunt at age six to ten. The procurement technology of choice is a firearm, although a few households also use traps or machetes as hunting tools as well. Among the Quichua sampled, there is now no use of "traditional" hunting tools, such as blowguns or spears. Hunters typically hunt alone, although they may be accompanied by wives on occasion and by children learning to hunt, and during times of fiestas, many organize group hunts. Both diurnal and nocturnal hunting is practiced, and dogs are used to hunt as well. Hunting patterns appear to differ across the three communities, although the sample sizes for Pachacutik and Pastaza Central are small (n=5 and n=6, respectively), so these findings have to be interpreted cautiously. In Pachacutik, the median frequency of hunts, once per week, has not changed, although the mean value has dropped from two and a half times per week to less than once a week now. The median duration of hunts in Pachacutik has dropped from 5 hours to 3 hours (mean values of 5.4 hours before to 2.4 now). The distance of hunts is approximately the same, from a median of 1km in the past to 2km now. Pachacutik hunters report that four of every ten hunting tries are unsuccessful now, resulting in no captured animals (success rates in the

past were not ascertained). Only one of five households hunts with traps. In Pachacutik, we recorded 46 hunting excursions, encompassing 72 of the 158 Quichua animal encounters. In 46 of these encounters (64%), the animal was caught. In 49% (n=35) of the cases, a firearm was used.

Pastaza Central hunters appear to hunt with less frequency: the median value has dropped from one and half times per week to less than once every two weeks. Similar to Pachacutik, the duration of the hunt has gotten shorter, from a median of 7 hours to 4 hours. There is a slight change between the past and current distances traveled during a hunt: the median distance in the past was 4 km, and now it is 3km. Out of every ten hunts, men report one or two are unsuccessful. In Pastaza Central, we documented 45 hunting excursions, or 64 of the 158 Quichua animal encounters. In 41 (64%) of those encounters, the animal was caught. In 42% (n=27) of the cases, the shotgun was the equipment used to kill the animal.

In Pilchi, hunting frequencies have declined as well: the median frequency in the past was once a week, but is now one and a half times per month. Unlike in the other two Quichua communities, hunts in Pilchi appear to have gotten longer, with a median before of 7.5 hours, increasing to 9.8 hours now. The distance traveled appears to have increased, from a median value of 3km to 5km in the present. Three of ten attempts are unsuccessful. Five of 18 households use traps regularly. Unlike the other communities, where the same trails are used by everyone, in Pilchi people have their own hunting trails, which they choose depending on the prey they desire to get. In Pilchi, 19 hunting excursions were documented, representing 22 of the 158 Quichua animal encounters. Eight (36%) of those encounters led to the animal being caught. 73% (n=16) of the time, a firearm was used in the hunt.

Overall for the Quichua, for 155 of the encounters, we know whether or not the animal was caught. Of these, 95 were captured, for a kill versus encounter ratio of 0.61. The most frequently caught prey by hunters in these three Quichua communities are (in descending order): agouti (*Dasyprocta* sp., n=17); armadillo (*Dasypus* sp., n=11); paca (*Agouti paca*, n=9); and acouchy (*Myoprocta* sp., n=6). Monkeys as a group account for 9 kills, but it is difficult to narrow that category down to species, and birds account for 18 kills, including tinamous, Cracid birds, toucans, woodpeckers, parakeets, and oropendolas.

In terms of women hunting, in Pachacutik, only one of five women interviewed hunts. She used to go every week, but now goes every three months. She sets traps for animals like agouti, *perdiz*, and acouchy. Whereas before she would walk 20 minutes to set a trap, now she has to go farther, for one hour, and nine of ten tries is unsuccessful. In Pastaza Central, few women hunt, and those who do only hunt in their gardens for animals that come to eat crops. One woman uses a gun and machete, used to hunt weekly but now hunts every three months, and travels only 30 minutes to an hour away. She reports that 6 of 10 tries are unsuccessful. In Pilchi, women hunt infrequently in the garden using machetes, traps, or sometimes shotguns. These excursions are more common when their husbands are absent.

People report that they generally eat the same animals now as before, and taboos have not changed. The Quichua eat almost all animals, including anteaters and jaguars, although there are some individuals who are more selective (and will not eat jaguar, for instance). People mentioned that some species of birds are not eaten, such as scavengers and raptors (e.g., *gallinazo*, *garzas*, turkey vultures). Also snakes are not eaten, although snails, frogs, and some insects such as grubs are. One informant said, "We eat everything because there are not enough animals to hunt," complaining of the high human population density in Quichua territory.

Unlike hunting, which is largely the domain of adult males, everyone fishes, beginning at about the age of six. There are a multitude of techniques to choose from: *barbasco* poison, hook and line, harpoon and visor, dynamite, and weighted net (*atarraya*). These methods all have tradeoffs in terms of cost, efficiency, accessibility, and danger. *Barbasco* poison is derived from a native plant and is considered an inexpensive and easy method; however, some investment in time and energy is required as these plants are often planted, take half a year to a couple of years to mature, and need to be harvested and processed. Roots, leaves or stems are collected from the garden, crushed between rocks, and placed in a shallow river. The poison leaches out and immediately fish die and float to the surface to be collected. *Barbasco* poison fishing requires larger groups, from five to more than ten people, and clear water to be able to see the dead and dying fish. If the location is chosen well, *barbasco* fishing can capture up to 200 fish, which would be divided among all the participants; but on a bad day only a handful of fish may be caught. The hook and line technique requires sitting silently for long periods of time waiting for fish to bite. It is most commonly done alone or by several people and can be used when the river level is high and the water clouded with sediment, but it requires a great deal of patience and is not very efficient per person/hour. One might catch 15 to 20 fish in a day, or only two or three. Harpoon fishing is done in conjunction with a visor to spear bottom-dwelling fish. Often done by children in groups, it requires clear water and can yield around 15 fish on a good day or just two or three. Dynamite fishing is done by adult men, as this is the most dangerous method. The dynamite can detonate unpredictably, and indeed, one motorized canoe driver working with the project lost his hand in such an accident. Not considering the time it takes to earn the money to buy dynamite ($4 per stick during 2001), this method is considered rapid. It is best used when the water is clear and when it can be done with groups of people. Dynamite fishing can kill over 100 fish on a good day or just a handful on a bad one. The weighted net is often used at night and can be done in any river condition. On a good day one can catch 30 fish or just a few on a less successful one. Along with dynamite, weighted nets are considered the most expensive techniques, costing around $30 to $40.

Unlike gardening, which does not have a strong seasonality, fishing is undertaken most in the months of August and September when it is very productive due to low river levels and clear water.

Unlike hunting, fishing is rarely unsuccessful—only 1 to 3 times out of ten. This is due to the nature and abundance of the resource, as well as the multitude of approaches and technologies, which allow for diversification in types of fish caught and microhabitats fished. Many Quichua say that they like to fish more than hunt, because fish tastes good, it is easier, and there is more fish than game.

Similar to the findings for hunting, is that there do not appear to be consistent trends in frequency and duration of fishing patterns over time. In Pachacutik, people fish less now than before, from a median value of one and half times per week to once a month. The duration is a bit longer now, from a median of 3 hours before to 4 hours now. Families eat fish from twice a week to three times per month, and more often in August and September. In Pastaza Central, the frequency of fishing has remained a median value of twice per week, although the duration has dropped from four hours to 2 hours. Fish is eaten about every other day. In Pilchi, the frequency has also remained unchanged (median of twice a week), although the duration has increased from a median of 5.5 hours to 8 hours. Fish is eaten at least once a week, some say daily.

The Quichua study participants were asked about plants they gather from the forest. They mentioned lianas for basket making; *balsamo*, *sangre de drago* and *uña de gato* as medicines; *paja toquilla* for construction material; *chambira* for handicrafts; and peach palm, *ungurahua*, *cacao de monte*, *uva*, *pita*, and *morete* for food. None of these is commercialized by these communities, and all are harvested with a machete or stick. From the 1658 household–days reported in the input/output diary, the Quichua harvested some non-edible forest product 12% of the days sampled. They report 209 non–edible products collected, 94% of vegetable origin and 2% of animal origin (the other 4% is unknown). Of these resources, 7% are used for domestic purposes (e.g., making utensils for the kitchen); 33% for medicine; 33% for making fire; 5%, for handcrafts; and 18% for construction (houses and canoes). People say that there are no strict rules regarding the collection of these items (e.g., about cutting entire trees down).

Although there is not much of a market for non-timber forest products, that is not the case for wood. As mentioned earlier, the Quichua use trees not only for construction, canoes, and fuel wood but also to earn money. The popular species include *cedro* (cedar), *chuncho*, laurel, balsa, *caoba* (mahogany), *sangre de gallina*, *coco*, *canelo*, *boyas*, *pechiche*, and *guambula*. Very little is sold in local Sucumbios communities; rather they are being sold to intermediaries and (in the case of Pilchi) tourism companies. However, no good estimates of the amount or value of wood sold was ascertained. Unlike in the other two Quichua communities, Pilchi residents say that they reforest by planting trees, but there are no details to confirm this. From interviews of all three communities, it appears that in order to take wood out of communal lands for sale, Pilchi residents first need obtain the agreement of community members during a community assembly. However, there is no regulation of people's sale of wood from their own designated *fincas*.

Speaking of agricultural plots, the majority (about 75%) of the Quichua interviewed in the three communities believe there is sufficient land for their present agricultural needs. The reasons given are various: the land base is large, the community has set aside land for future members, they only have one child, or their children do not want to settle in the community anyway. One of the few people who feel that there is insufficient land said that each person is going to want his own *finca*, and "sooner or later the land is going to give up, going to be more difficult, more problems." Even the optimistic ones foresee that the areas of cultivation will become smaller, as land is divided among offspring and new people arrive in the community. Those who feel that the gardens will remain the same acknowledge that the forest will shrink as a result. The perspectives of informants were split down the middle with respect to the question of whether or not the forest will disappear under this growing population and cultivation pressure. The residents who do not see the forest as disappearing said either that it is "too big" or that agricultural plots will continue to have patches of forest within them, that there will "always be crops next to forest," "that the forest will be in all of the *fincas*," and that "no one cuts all the forest to plant." The latter pattern of cultivation implies forest fragmentation, with likely serious implications for biodiversity.

For other natural resources—game, fish, non-timber forest products, and wood—we ascertained people's perceptions of scarcity. With regard to animals, informants said that their favorites to eat are agouti, acouchy, armadillo, peccary, and Cracid birds, and that all of these are now scarcer than when they were young. Particularly hard to encounter now are the White-lipped and Collared peccaries, tapir, deer, jaguar, capybara, monkeys, and paca. Reasons for the scarcity are said to be higher human populations, more hunting, conversion of land to agriculture, and noise from dogs and chainsaws. In contrast, fish are still seen as relatively plentiful, though communities differ in their predictions of fish populations in the future. In Pastaza Central, they say there are enough fish, and that populations are not changing. But in the other two communities, most feel that fish populations are also on the decline, because of too much fishing, water contamination, and excessive use of *barbasco* and dynamite. In Pachacutik, the community assembly established a rule prohibiting contamination of rivers and fishing with *barbasco* poison unless the community president and members were consulted. In Pastaza Central, the use of *barbasco*—which kills all fish in the stretch of river in which it is released—is prohibited. In Pilchi, informants report that no one in the community does anything to maintain fish populations. In terms of non-timber forest products, some believe these plants are not overexploited but others say they are generally harder to find now. Finally, trees considered scarce include balsa, *guayaca*, *chuncho*, *cedro*, and laurel, many of which require a long time to grow. Residents in Pastaza Central say that trees by the road have been depleted more than those in the interior of the community.

Before talking with people about their ideas and practices about conservation, we asked them to first tell us what their definition of a "healthy forest" is. The definitions given are very similar: a healthy

forest is one that has not been "worked" or touched by anyone. Trees, animals, plants, and fish are plentiful, and the air and water are clean. A healthy forest is one without deforestation, and no impacts of petroleum exploitation, "what it used to be when adults in the community were young." The value and benefits of a healthy forest are conceptualized in terms of its utilitarian value for human residents. Thus a healthy forest has good land to plant manioc and plantains, many animals to hunt, and provides forest products. The advantage of the forest having more plants, animals, and medicines is that it is easier to collect resources so the community does not have to depend on external goods.

When asked to give their definition of conservation, most people cannot. The few responses received included "having a reserve of forest," or "to preserve the forest for wood." One person replied, "To care for and maintain forest, without destruction or pollution, for the future." We then asked, "What do people do to conserve?" "What are the rules?" Despite sentiments that game resources are scarce, we found no strict rules of restraint, and some people said there are no restrictions of any kind. Hunters, for instance, can hunt any animal they choose, and kill as many as they want, with any frequency and with whichever tool. As one person put it, they can "just use the forest." But many expressed respect for the forest and the need for restraint, as seen in comments such as: "use what you need"; "humans should take advantage of the natural resources of the forest, river and animals, but without abusing them"; "live in harmony with animals, take resources without abuse." According to a few informants, the forest is also a place of spiritual significance: the home of powerful figures, such as the *Hiacapi*, a man-eater with six heads, and boas twelve meters long. Although some respondents said they do not have such beliefs about the forest, others mentioned forest and animal spirits that can cause bad luck to those who kill animals indiscriminately. In any case, all respondents feel that the forest, river, and animals are important for the future as food, medicine, and shelter.

Quichua Perceptions of Outsiders and Aspirations for the Future

Quichua residents were asked about the types of outsiders with whom they come into contact, and how they feel about them. Some of the most powerful outsiders are the oil companies, whose presence and activities are largely outside of their control. Overall sentiment about these companies reflects disapproval of the environmental problems associated with them and the highly unbalanced power relationships between oil company representatives and community members: oil companies bring contamination, trash and deforestation; they cheat local residents by giving them simple gifts in return for entering the community to drill oil wells. Logging companies are viewed similarly, considered exploiters of the forest since they cut down many trees and pollute sources of water. In contrast, tourists, missionaries and researchers are generally considered more benign, perceived by most as having good intentions and doing no harm to the community or environment, and sometimes actually helping the

community. Some perceive tourists, however, as carriers of diseases from the outside. One person said that all outsiders use up natural resources in exchange for nothing, and that in dealings with outsiders, indigenous peoples are often shortchanged.

Informants also have mixed sentiments about the differences between themselves and outsiders. They note the diversity of people outside the community, including people of African descent, colonists, and Caucasians. "Here," one said, "it is just us." Some Quichua feel that outsiders are not very different: although they may speak another language, "there are also good people" among them. Most informants highlight perceived disparities, however: comments range from "people in Lago are often scoundrels or in gangs," to noting that class differences are greater outside the community. One person said that outsiders have a bad attitude toward indigenous people, whereas indigenous people are friendly: "Outsiders treat people from our community badly but we treat people from the outside well." Outsiders are also considered by some to be stingy and materialistic, doing everything for business, but not giving anything in return. In addition, most outsiders are *blancos* and "emphasize the individual rather than the community," whereas many people perceive places like Pilchi as more community-oriented.

Despite these mixed sentiments about outsiders, most Quichua would like to receive assistance from them. They want things such as courses on health and better medical attention; assistance with chicken- and cow-raising projects; more income-earning opportunities; a communal house and volleyball and basketball courts; workshops on pisciculture and agriculture, especially technology to increase the coffee and corn yields; and assistance in delimitation of community territorial boundaries. They want roads, electricity, a larger school, a medical center, and potable water. In a comment that leads to a discussion about ideas of "development," one resident said, "Outsiders teach us how to work…it is good they come to visit because they give us good examples."

Quichua in the study communities were asked their definition of "development." Many are not certain, but mentioned various aspects that are associated with the term, including the idea of "progress," "advancement," "moving forward," and "bringing in new things to live better." Development is considered a good thing, synonymous with money, health, education, services, work opportunities, and community expansion. By working on projects such as fish farms, aviculture, and cattle, they can be more developed. Development means having all those things mentioned above, from the volleyball court to potable water. Interestingly, some said that development is working in groups, planting crops communally for the future, and that "when there is harmony in the community, there is development."

One thing inextricably linked to "development" is road access: infrastructure improvement "helps us get products out faster, so we can sell more." Roads signify an easier way not only to transport goods, but also to visit family in other communities and to have better access to health care. However, people also recognize problems of road access—more contact with criminals, Colombian guerillas, *delincuentes*.

A road can mean loss of tranquility, as more people come to the community, bring in more sickness, destroy the forest and eliminate the animals. In interviews, people were asked to weigh the advantages and disadvantages of the road versus those of the forest. What is more important now, and what will be more important in the future? Opinions are fairly evenly split, about half saying that the advantages of an intact forest outweigh those of having roads and markets. The issue of what is better in the short term versus long term also received mixed responses. People emphasized that the road is an important amenity now, to sell products and to be able to receive needed goods and services. But the forest is also important in the short term as a source of food, and in the long term, for the next generation.

Given that people spoke of how the forest provides basic sustenance through game, food, construction materials, and medicines, residents were asked if they could envision living outside of the market economy. Those who feel they can survive without money are in the minority. The majority (half of those interviewed in Pachacutik, all but a few in Pilchi and everyone in Pastaza Central) believe that money is necessary for life. Items such as salt, soap, clothes, matches and fuel are mentioned as goods that one could not live without.

Next, given that people spoke favorably about their lives in the community, how they have land and resources, good soil, and nice neighbors, they were asked about their perceptions of urban areas and if they would move there. People like to visit the city (e.g., Lago Agrio) because of the multitude of diverse, luxurious buildings, stores, restaurants, and parks. There is much to see, to buy, and to eat. But many commented on the challenges of life in the city: "in the city, everything is money," "hunger happens there," and "when you have money you feel good, when you don't you feel bad." Despite the fact that people acknowledge that the city can be dangerous, corrupt, polluted, noisy and expensive, most Quichua informants would move there if they had enough money.

Our assessment of people's aspirations was intergenerational—both their desires for themselves and then for their children. People were asked about their consumption aspirations, what they would like to eat more of, and conversely, eat less of. Protein—fish and meat—are at the top of the list of things people want to be able to eat more of, along with eggs, cheese, rice, noodles, and lard. Although some respondents did not want to answer the second question, so as not to appear ungrateful, others said that they would like to eat less peach palm, monkey, manioc, rice, plantains, and noodles. People want to be able to buy more beef, lard, rice, salt, beans, potatoes, tomatoes, noodles, onions, butter, candy, fish, cocoa, and milk. Other things they would like include things for the home—such as a radio, sewing machine, stove, shotgun, television, chainsaw, outboard motor, generator, pots and pans, machetes and ammunition. For themselves and their children they would like to buy clothes and shoes, as well as makeup for women, and toys for the children.

Looking ahead to the future, adults were asked what their educational and career aspirations are for their children. All parents want their children to at least finish primary school, to graduate from sixth grade. Young people need to learn, as "times are changing." Many mentioned that they want their children to go to secondary school, *colegio*. Educational aspirations are generally higher for sons than daughters. People want children to be educated to be *capacitados*, to make something out of themselves. While some see education of children as an end in itself, others see it as a means to a monetary end. Some view the education of the next generation as having important community, not just individual, benefits: education can lead to community progress, as those who learn to read can help the community with documents and governmental transactions.

In terms of occupations, Quichua boys usually begin to earn money at the age of 15 to 18. Many parents want their sons to finish school first, so they can get better jobs. In Pilchi, with nearby high-end jungle lodges, the majority would like their sons to be tour guides, but other desirable jobs mentioned there and in the Sucumbios communities include a mechanic, farmer, engineer, office worker, teacher, and oil worker. One said that oil work is good because of the pay, since "life is expensive," while another said being a teacher is a good job to not "suffer in the *campo*." It is perceived as important for young men to look for work to cover their needs and help their parents. In terms of wage labor opportunities for females, some teenage girls will get jobs outside the community doing agricultural work, chicken projects, domestic work, handicrafts, secretarial work, or cooking. Although most emphasize that girls should also get an education, people are divided about whether they want their daughters working, or instead staying in the community to start a family. Those supporting the former feel that acceptable jobs include domestic helpers (maid, cook, nanny), work in a beauty salon or office, or selling handicrafts.

Despite their stated desires for "development" and admiration for some aspects of city life, the Quichua overwhelmingly want their children to stay in the Ecuadorian Amazon, and more specifically, their home community. This is *their* home, they said, there is ample land and resources, life is good here and they should remain near the family. Thus children should stay and help their parents and work the *finca*. Even those who express a desire for their children to find better educational and job opportunities outside the community still hope that their children will stay in the *Oriente*. Only one couple stated that they hope their son leaves to find a better life outside the *Oriente*, even if it means going to another country. For daughters, parents are more flexible, seeing that she will need to go with her husband to start their household, but they still want her to stay in the region.

We also asked, "Even if your children stay in the Amazon region, what will their standard of living be like in the future, what kind of environment will the next generation have?" Responses here are unilaterally pessimistic: there will be fewer natural resources, the large trees will be gone, and much faunal life will be nonexistent. This will be due to population increase, the contamination of oil

companies, the pollution of streams, and the impact of roads. One person envisions the core villages devoid of forest, insufficient land for everyone, and no plants or animals because all the lands will be in use or degraded. Despite this ecologically pessimistic outlook, some people say that their children will be living better, with more services and goods, roads, health care, and modern technology. Life will be better due to their having more education and more money: people will study, and with more education they will have more economic resources and can buy outside food. On the other hand, not all are optimistic about their children's future, predicting that their lifeways will drastically change and never return to what they used to be, and their culture will disappear with modernization.

THE SHUAR

[Shuar woman posing hunted squirrel. Photo: David Chavez]

Known as "Jivaros" to the early missionaries and anthropologists, the Shuar have inhabited the upper reaches of the Amazon basin in southeastern Ecuador since before the Inca arrived. Along with the Huambisa, the Achuar, and the Aguaruna, the Shuar are members of the Jivaroan language group that encompasses populations along the Peru/Ecuadorian border in the western Amazon. Of the four groups, the Shuar are the most numerous, numbering more than 40,000 people. They have a long history of contact with outsiders: in the early 20th century, Catholic priests from the Salesian order, with support from the Ecuadorian state, established missions at the base of the Andes to contact and convert the Shuar to Christianity. The priests were followed by families of poor mestizo colonists, who began to

appropriate Shuar lands. This pattern of land invasion continued over and over between 1920 and 1960; the colonists would secure their land claims by clearing a patch of forest, planting pasture, and establishing cattle (Rudel *et al.* 2002: 147). Colonization increased as a result of the land reform laws in Ecuador in 1964, 1973 and 1977, which created programs to establish a "living frontier" along the border with Peru by encouraging settlers to clear forest and establish farms on "unoccupied lands." To counter the colonist invasion, the Shuar, at the urging of the Salesians, reorganized themselves from dispersed household settlements to clusters of houses called *centros* in 3,000-6,000 hectare tracts to which the Shuar villagers laid claim. To reinforce their claims, Shuar households imitated colonists and cleared forests and acquired small herds of cattle. An important development occurred in the mid 1960s: the Shuar founded the *Federación de Centros Shuar* to defend their land claims and culture. By the late 1980s, the Shuar had secured approximately 40% of the arable lands in Morona Santiago for themselves. Although the *centros* hold global titles to land, household heads can sell their individual tracts of land to other Shuar or pass it along to their children as an inheritance (Rudel *et al.* 2002: 148-149).

Given their high population densities, many of the Shuar in the southern provinces of the Ecuadorian Amazon have begun to migrate northward, to the provinces of Orellana, Napo and Sucumbios, in search of land. This places them in the unusual situation of being migrant colonists at the same time as they are indigenous peoples. The discussion below is based on one such community of Shuar "colonists." The community of Tiguano is comprised of Shuar who migrated north from Morona Santiago to Orellana province, in our study region. It is important to better understand the Shuar who are becoming more prevalent in this region. At the time of our ethnographic data collection in 2001, Tiguano had 13 households, comprising 70 persons.

Shuar Demographics

Most of the residents of Tiguano are young: 55% of the males and 56% of the females are under the age of 15. The sex ratio is 1.2. 37% of the residents were born in the community, mostly the younger ones, demonstrating that virtually all of the adults migrated there. None of the residents are monolingual Shuar speakers; 86% of the adults (age 12 and older) are bilingual, speaking both Shuar (or in the case of three residents, Quichua) and Spanish, and 14% are monolingual in Spanish.

Of the 12 women who answered questions about their marital status, 5 are married, 4 are in a consensual union (*union libre*), 2 are widowed and one is separated. None is part of a polygynous marriage. The average age at first marriage for women is 15. When women were asked how many births their mothers had borne, they replied an average of 8.3 children (median 9.5). While some women do not know how many births their grandmothers had, the average among the women who did was about 8 as well. The Shuar women interviewed said that they breastfeed their infants for generally one year,

although one couple continued to two years. Almost all women believe that breast milk is the best food for their babies, and that it helps them grow better and begin crawling faster. Only one woman said that purchased formula was better, that it had vitamins, and that if she had the money she would buy formula.

Between three and fourteen months Shuar children begin to eat soft foods, such as soup (noodles, potatoes), eggs, palm heart, *chicha dulce* or *colada de verde*. Mothers said that this is necessary as they are hungrier and want more milk than they produce, and because they need to learn to eat solid foods. Nearly all women report that their children have problems with diarrhea. About half use vegetables and medicinal plants to cure diarrhea and half use Western medicines. We also ascertained knowledge and use of contraceptive methods. Seven of the 12 (58%) female respondants had heard of birth control methods, but only a few women said that they have ever used any method (several reporting use of the rhythm method and one has been sterilized). They feel that using contraceptives will make them sick or feel bad, but almost all feel that it is good to regulate the number of children they have since children are expensive to raise. Of 12 women interviewed, only two want to have any more children.

Mortality information is imprecise, as is inevitable in such a small population: 18% of the 83 live births of the Shuar women were not alive by the time of the study, dying at infancy or in childhood. Regarding adult mortality, informants were asked the causes of death of their parents and grandparents. Some say they died due to black magic or witchcraft, *mal hecho* or *brujería*, while others say it was due to illness, snake bite, or *dolor de huesos* (literally, bone pain).

Regarding education, data are available for the 15 male and 13 female adults who have finished their schooling. For males, six (40%) did not complete primary school while nine did. Three of the nine started secondary school and two completed it. For females, 5 have no education or did not complete primary school, while the remaining 8 (62%) finished primary school. None even started secondary school. In this Shuar community, the younger children attend school five days a week, from 7:30 A.M. to 1:00 P.M., or 5.5 hours per day. Most children rarely miss school, being ill infrequently and usually for brief periods. A more common reason that children miss school is heavy rains, which keep them at home.

The effect of a long history of interaction with the Salesians is evident in the Shuar's stated religious affiliations: all said that they are Catholic and that their parents are Catholic. Over half regularly attend religious services in the community. There is no consensus on when the church in the community was built, but it was between 1994 and 1997. Missionaries are generally perceived as neutral to positive ("it is good that they visit and come speak about God;" "they bring us good news"). They give mass, baptize, and perform weddings but are perceived as needing to provide more community assistance ("they don't help in anything more;" "it is bad because they do not help;" "they only give mass and they go").

Questions in the demographic interview also inquired about migration and mobility. None of the informants' parents was born in Tiguano, which reflects the recent in-migration to establish this

community. Most come from Gualaquiza in Morona Santiago, while other emigrated from Nañarmak and Kenkum. Only 37% of the residents in the community were born in Tiguano, and these are all children. When asked who decided to move to the community, about a third of the time the woman said that she made the decision. Thus, for the majority of residents, it was the husband or father who made the decision to move to Tiguano. They came to the area for land: there is still plentiful land in Tiguano, and little land elsewhere. Up until 2001, none of the community members had migrated away from Tiguano, except for one person who moved away due to "problems" (unspecified). Women were also asked who decides whether to stay or go: a third said that they decide for themselves, a third make a joint decision with their spouse, and for the remaining one-third, the spouse decides. Most expect their children to stay in Tiguano, despite the fact that most have had children go away to study. Some of the younger generation moved away after marriage, and a few have left Tiguano to live in Coca. When people were asked why they remain, they explained that their farm is there, they stay for "family and for land," because they are able to meet their subsistence demands, or because they like living there. Residents were asked about their mobility—why and how often they take trips. Some leave the community weekly, most monthly, and a few "infrequently." Trips to Coca are common for market activities, but to visit family and attend fiestas people go to other Shuar communities such as Rumiyacu, San Vicente, Tsankim, Santo Domingo, Tsarentza, and Tiwirma. Some residents have also been to Quito. None of the families has another house outside the community.

Shuar Social Organization

The community of Tiguano is organized into households whose adult members are *socios* of the community, which in turn is part of the Shuar Federation. Communities are led by a trustee (*síndico*) or president, a vice president, a treasurer, and a secretary. These officials are elected every two years by majority vote. Elected leaders are in charge of organizing *mingas*, mediating interactions with outsiders, and resolving internal conflicts. *Mingas* are generally held every Monday for various tasks, from cutting the grass around the school to constructing a communal dwelling. All members are required to attend or to send a representative, or pay a fine (about $1). *Mingas* are an adopted practice among the Shuar, who had smaller scale reciprocal labor exchanges in the past. Now, with increasing social organization, *mingas* are more common.

In terms of property ownership, a combination of private and common property exists. The latter includes the 100 hectares of land in the center of the community, as well as the school, eating area, chapel, and construction tools. Tiguano, a recently formed community, appears to maintain most of the land as private property, with each member household possessing their own plots of 100 hectares on which to plant their subsistence and cash crops. This land can be bequeathed to offspring or other family

members, but cannot be sold to outsiders, with people forsaking usufruct rights if they leave the community. (However, one person thought that they should be able to sell the land if there was someone who wanted to buy it). All residents in fact plan to give their land to their offspring. Four had already done so, transferring part of their lands to a son or daughter when they got married. All of those who received land now live in homes on their land, separate from their parents. As a side note, the community demonstrates that although it cannot technically sell land, it can collect money from an oil company that uses about one hectare of Tiguano land for a platform for petroleum exploitation.

Most exchanges of labor or goods occur between members of the same kin group, most commonly between parents and their grown children, although not all families participate in exchanges. Food is the item most commonly shared, either garden (often manioc or *chicha*) or store-bought food. A couple of families participate in barter-like transactions, exchanging manioc for diesel fuel, for instance. Most said that if a large animal were killed they would share the meat with their family or even with everyone in the community, depending on the size of the animal.

Shuar Household Economics

We first discuss the standard of living and dietary patterns, then involvement in market activities and cultural values surrounding wage labor.

Tiguano, as of early 2001, did not have electricity. With no plumbing, human wastes are eliminated outdoors, in the forest or river. Water for drinking, bathing, and cooking comes from a stream, river, or rainfall. The wife mostly does the task of collecting water for the family, although her children and occasionally her husband help; in median values, the water source is 5 minutes away on foot, and this task is done twice a day. For fuel, the community uses mostly firewood, although a couple of households rely on wood only when the propane gas runs out. Women again do most of the collecting of firewood. The wood is usually taken from the household's *finca*, around 15 minutes away, and the frequency varies widely, from almost daily to once every two weeks, with a median of twice a week.

What do the Shuar of Tiguano eat? A dietary checklist was included as part of the household input/output diary form, and 413 household-days were recorded. The residents of Tiguano do not largely depend on animal protein from the forest: on 70% of the days sampled, families do not eat any forest game, and on about 60% of the days, they do not even eat fish. Even domestic animals and purchased meat are consumed only 39% of the days. On the other hand, eggs appear to be an important source of protein, and are eaten on 45% of the days. When asked about their favorite foods, only half of the 12 households said that they prefer food from the forest—these were households further from the road. The main components of the Shuar diet are grains and manioc (75% of the days) and fruits (62% of the days, predominantly plantain and bananas). Legumes and dairy products are eaten on fewer than 20% of the

days, and nuts and seeds, 7%. Of all the ethnic groups in our study, the Shuar have the highest consumption frequency of insects, at 25%. (The Quichua of Pilchi are similar to the Shuar at 23%, but all the other communities consumed insects and grubs less than 10% of the days recorded.)

Families generally eat three times per day, but sometimes only two. Three-quarters of the informants said that there has never been a lack of food. The remaining informants reported a food shortage sometime in the last week, a condition which could be remedied by a visit to the *chacra*. With a diet comprised mostly of rice, garden carbohydrates and eggs, an absence of the male head of household does not result in much dietary change, in contrast to the Quichua, Huaorani, and others. Most women confirmed this finding, saying that there was not much change in diet. Furthermore, men do not typically leave the community for long, which may also contribute to the consistency of the Shuar diet. Women tend to fish and work the same as usual, and sometimes their sons-in-law, children, or parents help out, providing meat. For half of the Shuar households, those near the road, the food eaten is the same whether or not the male head is present. Women eat more food from town, or whatever is left around the house. But for the six families farther from the road, responses to the absence of the male head are the same as for many of the other indigenous groups: they eat less forest game. The diet of the family then becomes primarily manioc, plantains, and other things women can collect, such as eggs.

All households surveyed purchase food from the market, either in Coca or from neighbors' stores in the community. The most commonly purchased items are rice, noodles, sugar, oil or lard, canned tuna, salt, oats, and peanuts. Every household buys rice, from two pounds to one *quintal* (100 pounds) per month. They choose these items because of flavor, children's desires, and/or the utility of containers (such as gallon tubs of lard) to carry water. Most purchase goods monthly, some every one and a half months. Women were asked if they would prefer a diet of only purchased foods if they could afford it, leading to a range of responses: four say they would stop fishing and store-bought food would be sufficient, but one of these says store-bought food would not taste as good. Five other women say they would not stop fishing even if they had enough money. Since so little hunting goes on in this community (some households have given up hunting entirely), women did not address whether they would give up eating forest game if they could afford to buy all their food. When the same question was asked of men, the majority said they would continue the same level of hunting and fishing (at a low level, however).

What are the ways in which Shuar men earn money? The sale of cash crops, domestic animals, and timber are discussed below, but the main form of wage labor is for petroleum companies. Fully 78% of the men surveyed have worked for an oil company at some time, exceptions being a teacher and a carpenter. The oil companies most often mentioned are Harver, GAPS, and Elf, and most men have worked for two or three stints, each lasting one to three months. This employment history of Tiguano men with petroleum companies goes back about four years. The U.S. petroleum company Vintage was

actively exploring for oil in Tiguano during our fieldwork. At least four male heads of household were involved in wage labor for this company during the study, mostly for easy, token positions, such as guards. As mentioned above, most men in Tiguano are not away from home for long periods of time. Because of recent work with oil companies, it has become more common for men to be absent from the home for an extended period of more than a month.

With respect to women's participation in market activities, all twelve have been involved in some income-generating activity. Ten sold coffee and domestic animals such as chickens and pigs. Two had also been hired as cooks (one in a private home in Coca, the other for an oil company). In addition, one woman worked for Ecociencia (an Ecuadorian ecological research institution) in tourism and ethnobotany. Three women specifically said that they would never work for any oil company, and two stated that they would not work outside the community. At the time of the study, two of the 12 female spouses of heads of household had recently worked for pay; one for Ecociencia performing Shuar songs and dances, and the other as a cook for a family in Coca. The latter woman did not like her work since it took her away from her home and farm.

With respect to local income-earning possibilities, agriculture is the most important among the Shuar. All households sell agricultural products to middlemen who stop by Tiguano on Fridays. Coffee is by far the main cash crop, although peach palm fruit and rice are sold. Although all families sell coffee, the amount sold varied widely in 2000, from 4 to 50 *quintal*es (with a mean of 25). The price was around $7 per *quintal*, so some families earned over $300 a year. Besides cash crops, families also sell domestic animals. Of the 12 women interviewed, only one raises animals just for household consumption. Of the rest, six had sold domestic animals in 2000, ranging from 2 to 3 chickens, to one cow or pig, to up to 150 chickens to a businessman, earning from $13 to $225. Men were also asked about the sale of domestic animals, and instead of mentioning chickens sold by their wives, they chose to focus on cattle. Five of the 12 households reported selling cattle in the previous year, and two households sold a bull in the previous month, earning $300 to $480 each.

In contrast to the sale of domestic animals and the practices of the other indigenous populations studied here, there is almost no sale of forest animals by the Shuar of Tiguano. This is presumably because of the low frequency of hunting, perhaps linked to scarcity of game. One household reported selling a "*machingui*" monkey as a pet "once a long time ago" and says he hunts less now because he has less time. Two households report selling meat: one sold paca (*guanta*) meat a year ago and the other sold paca three times in the past year.

Timber and non-timber forest products are discussed below in the section on resource use, so only brief mention is made here. At least half of the households in Tiguano sell lumber to middlemen, but the amounts and earnings were not revealed. For many indigenous communities, handicrafts can be an

important source of income, but this is not the case for the Shuar of Tiguano. None of the men or women makes handicrafts for sale (and it does not appear that handicrafts are commonly made for home use either, although a certain percentage of forest products were collected for this purpose, see below). This perhaps further indicates the assimilation of this population into larger Ecuadorian society.

Both men and women were asked about the acceptability of women participating in wage labor. Men generally think that work and wage labor is a male domain, and that women should not engage in wage labor since they would have to leave the village, which is seen as having negative impacts on children. "It is better to be in the community," says one man. Nevertheless, many daughters are studying and/or working away from home. While this is not unusual for single women, it is still rare for a married woman to work for pay. When women were asked about the appropriateness of work for pay away from the community, they generally answered the same way as the men, i.e., that it is not a good thing for women to work outside the community, and that women should be with their children. If a woman is single, then it is less problematic, although abandoning the house and family is seen by many as unacceptable. A few women, however, feel that it is acceptable for a married woman to work outside the community under certain conditions: if she has permission from her spouse, if it is absolutely necessary for the family, and/or if she likes wage labor. Since the cultural acceptability of men engaging in outside wage labor is not an issue, women were instead asked if they would like their husbands to work away from the community. Of the eight who responded, all say yes, but two added that they only want his wage labor stints to last a short while. These women stress that they need the income to buy clothes, food, a chainsaw and other things; to pay the hospital and other debts; to travel and visit family; and to keep their children in school. Women were also asked if they would rather have their husbands away working or in the community. Five said that they would prefer their that husbands work outside the community since they could earn more, while three explicitly said that they want their husbands to work only in agriculture in the community.

Shuar Agricultural Patterns

As mentioned earlier, agricultural activities, including the raising of domestic animals, constitute the main source of livelihood for these Shuar families. In this section, general agricultural patterns will be described, (including crop selection, fallow practices, and soil preferences), followed by a discussion of use of external inputs, labor practices and inputs, raising of domestic animals, and perceptions about whether the Shuar have enough arable land to meet future needs.

The principal crops in Tiguano are manioc, plantain, and coffee. The first two are for household consumption (plus animal feed) while coffee is sold. Secondary crops include peach palm, rice, pasture for cattle, sugarcane, *barbasco*, potatoes, pineapple, sweet potato, chirimoya, and avocado. The 12

households reporting have a minimum of two *chacras* and a maximum of eight, with a mean of 4.3. There are 52 agricultural plots represented in our sample. Almost half of these gardens (24) are "monocropped," that is, allocated to a single crop, as is customary among colonists. Thus, for example, if a plot was mostly manioc but had some sugarcane, it would not qualify. Of these single-use plots, 42% are dedicated to coffee and 38% to pasture. This strongly suggests that market-based activities lead to uses of land counter to the predominant indigenous agricultural pattern of polycropping. Unlike coffee, which is often grown with other crops such as pineapple, peach palm and plantains, pasture is inherently a monocrop. Seven households have plots in pasture, which represents 17% of all the plots in Tiguano and doubtless a higher percentage of the total agricultural area. Eleven of the twelve households harvest coffee; those with only two or three plots have one plot in coffee, while those with four or more plots have at least two coffee plots, with one of those monocropped. One household with eight plots has three dedicated to coffee, and another with six plots has four in coffee, two monocropped. At one end of the spectrum are these monocropped plots dedicated to production for the market, and at the other end, are polycropped gardens used primarily for subsistence production. If we define fully polycropped *chacras* or gardens as those with three or more cultigens, then seven of the 52 plots in our sample qualify, or 13%. These are found among five households. Thus, less than half of the households in Tiguano have *chacras* that can be considered diverse. What appears to be more typical among the Shuar is a pattern exemplified by a household we coded as Number 5, which has five gardens: one with coffee (and some peach palm), another with only coffee, two in pasture, and one (the subsistence garden) with manioc and plantains.

The age of gardens varied from three months to 13 years, with the gardens older than six years all having coffee as the main crop. With age data available for 43 of the 52 *chacras*, we calculate an average age of 3 years and 5 months, with the median at 24 months. Respondents say that their manioc fields are used for coffee or pasture after 1 to 3 years, at which point they can be maintained for long periods of time. Gardens in which this is not the case, i.e., ones with subsistence crops, are in active cultivation from 1.5 to 3.5 years, and are then fallowed for two to five years before being used again. During this fallow period, the plot is still used to harvest palm grubs, *barbasco*, plantain, pineapple, herbs, peach palm, and potatoes. One informant mentioned using the garden for hunting as well, which is far less common among the Shuar than is the case with fallow *chacras* in the other indigenous populations.

In choosing sites for *chacras*, farmers look for dry ground and flat areas, and preferably, close proximity to the house. Manioc appears to require the best land, and after a couple of years, an area cannot support good crops of manioc any longer. Coffee can be grown in either flat areas (preferred for manioc) or in *medio loma*, slightly hilly areas. Along with manioc, rice needs good soils, whereas coffee can tolerate most types of soil. Pasture can do well in sandy soils but in other respects needs better soils

than coffee. The Shuar consider good soils to be dark in color and in areas with low moisture levels, such as low ridges. Poor soil is found in muddy, sandy, boggy, and humid conditions.

For the Shuar of Tiguano, the size of the *chacra* or garden depends on a variety of factors, including household size, labor inputs available, and length of time living in the community. Six of ten respondents said that their gardens are smaller now than before, because their family is smaller. Three said that their gardens are larger because they "work a lot." For one household, garden size has not changed. Unlike some of the Quichua informants, who mentioned that garden size is also influenced by misfortune, the Shuar did not give this as a reason, though this does not mean that there are no risks to gardens in Tiguano. All informants agreed that animals are a recurrent threat to their gardens. Rabbits and rats, along with worms that infest the manioc and plantains, are the most common complaints. Many had experienced these pests within the past month. It is interesting that the Shuar did not mention larger animals such as peccary or deer as pests in the gardens. Pests appear to be an increasing threat to gardens, although some say their prevalence is the same as in the past. High winds are also named as a common danger, especially for coffee plants and banana trees. *Broca* disease is increasing and a threat to coffee plants specifically.

Besides garden size, residents were asked about changes over time in crops. While crops have not changed much, there is more coffee being grown. People also mentioned wanting to plant corn, which grows fast, is good chicken feed, and sells well, and more rice, both for subsistence and market, since the price is good. Less common responses regarding new crops they would like to grow include *achiote* and *pimiento* (pepper). The broadly expressed desire of the Shuar to increase agricultural production for market is likely to signify an increase as well in the use of external inputs, not only of seeds from the outside but also of chemicals. Nevertheless, up to now the use of external chemical inputs in Tiguano has been minimal, with only 5 of the 12 households using herbicides around their coffee plants (Ranger, Gramoxone, and Madexone) to kill weeds. This was either a one-time use or has been discontinued.

Informants were asked to provide a general agricultural calendar. It begins in December or January with clearing the underbrush on a plot, a task done mostly by men with machetes, and requiring one to two man-weeks per hectare. Then trees are felled by men with either a chainsaw or axe; using the former takes a man a day and a half per hectare. The Shuar burn their fields in the driest months of December/January/February, again this task being done by men. This is followed by planting, a task performed primarily by women but sometimes assisted by men. Estimates of the amount of time needed to plant varied from two person-days per hectare for coffee to a week per hectare for manioc. Weeding is done by women with machetes every four months for manioc, and by men every five to six months for coffee. Finally, women generally harvest manioc, while men harvest coffee, the cash crop.

Agricultural tasks are mostly done by members of the household, but when extra labor is needed, the Shuar rely on *prestamanos*, *mingas*, and to a lesser extent, the hiring of laborers. In Tiguano, the most common labor source from outside the nuclear family is via *prestamanos*, or reciprocal labor exchanges between households; fully 75% of households use it, one to four times per year. The tasks involved are largely market-oriented activities: the weeding of coffee, harvesting of coffee, and cutting wood into planks. *Mingas*, or communal workdays, are another source of agricultural labor; two-thirds of the households use *mingas*, mostly for weeding but also to cut trees and harvest coffee. At these *mingas* 5 to 10 people show up, averaging 6 persons, and in return for their labor the workers receive food and *chicha*. Seven of the eight households who use *mingas* had one within the past year. Interestingly, the four households who report not using *mingas* all still participate in other people's *mingas*; on the other hand, five households who hold *mingas* do not join in the *mingas* of others. When asked about hiring laborers for agricultural tasks, a handful of Tiguano residents said that they had paid local people, other indigenous people, and infrequently a colonist to help, mainly with the weeding of coffee. Laborers earn $12 to weed one hectare, and $6 per day to cut trees. Opinions vary about a change in the use of laborers: of the five who responded, two said it is the same, two said more outside labor is being used now, and one said there is less outside help being used now.

As mentioned earlier, the raising of domestic animals is an important source of meat and income for Tiguano households, and is an economic activity in which all households are engaged. Numbering 3 to 30, chickens are the animals most commonly raised, primarily for domestic consumption but also for sale (and to trade within the community for things like diesel gas for generators). About 40% of the families own between two to six pigs, primarily for household consumption. About 40% own cattle, having 2 to 18 head, as a store of wealth and for sale. Horses are owned by two-thirds of the families, seven having one and one having two. Two households also have a mule, one family owns ducks and another raises guinea pigs. People say they raise fewer domestic animals now than ten years ago, although the reasons were not clear.

The majority (two-thirds) of the Shuar interviewed believe that there is sufficient land for their agricultural needs since the *fincas* are large. The few people who feel that there is not enough land gave reasons such as having a small *finca* or many children. We asked where people will find more land to cultivate in the future. Five respondents said that they do not know, while two responded that it is not necessary to go anywhere, that there is plenty of land left. This optimism is not shared by all, however: three people said that unoccupied lands are hard to find, and that every place is already settled. One person explained that in Tiguano they will preserve the land and reuse it, thereby obviating the need to look for new land; furthermore, they have a great deal of land in the community and just need to "work" it. The respondents are unanimous, however, in their prediction for what is going to happen to the areas

of cultivation: plots are going to be subdivided, as land is divided among offspring and new people arrive in the community, and *chacras* will become more numerous but smaller. Informants are evenly split about whether the forest will disappear under this increased population and cultivation pressure: four said that the forest will disappear, but one added that this will happen "after much time." Two said that it is possible for the forest to be cleared away and eliminated, and one did not know. On the other hand, another four believe that the forest will continue to stand, although one did acknowledge that it might shrink: "Perhaps, [but] it is not possible for the forest to disappear."

Does the next generation differ from the last in terms of agricultural practices or perceptions? Answers here are also split, some asserting that the youth have a perception of agriculture similar to that of their parents, while others feel that they have "different ideas," want more money, and that they will not remain in the community clearing forest and growing crops. One person says, "Yes, there is a certain difference about cultivation, because the elders had their way of cultivating, *chacras* were very well maintained. Now the youth don't care for their *chacras*." Despite many complaints about the lack of young people's commitment to agriculture, respondents are pretty evenly split in their opinions of whether young people work more or less now than they did in the past. Of nine responses, two said that they work equally hard, and four said that they work less hard, e.g., "The youth of today are lazy, those of the past were workers." Three others stated that the young have to "work harder and more than before for money," since they are more oriented to the market.

One of the interview questions asked, "Will people become more dependent on work outside of agriculture in the future, or will they work together and remain here, or will they move to other places and have a different type of life?" Responses to this question vary greatly. On one end of the spectrum is the opinion that life will not change, that people will remain in the community. Close to that is the comment that it all depends—some will leave the community but others will remain. Someone suggested that yes, they will stay in Tiguano, working even harder in their *fincas*, and another said that they will sell their current *finca* and search for a new plot within the community which has forest. Others, however, foresee the dissipation of the community; one said that with time the Shuar will leave the community, and that he can already see that people are less interested in Tiguano. A couple of people said that the young will go to work or study outside the village. At the extreme end of the spectrum, one predicted that "in the future, people will become more dependent on work in oil companies," and another added, "we will live in cities, will have contracts with companies, and our lives will change."

Shuar Resource Use and Conservation

This section summarizes findings about Shuar use and management of the forest and rivers. First we describe hunting patterns, then game taboos, fishing, gathering, and use of timber. We conclude by discussing Shuar perceptions of resource scarcity and ideas about conservation.

Among these Shuar, half of the men said that they do not hunt. The other half went on their first hunt between age 8 and 18 (12 being the average). The procurement technology of choice is a firearm. The Shuar are taught to hunt by their fathers who also give them their first gun. Among the Shuar sampled, there is no use of "traditional" hunting tools, such as blowguns, although one man said that his dad taught him to use a blowgun when he was 12 (the blowgun was made by an Achuar Indian, however, and his dad had bought it). Hunters typically hunt alone, although they may be accompanied by wives on occasion (she may help carry game, collect palm hearts, or fish with poison), and during times of fiestas many organize group hunts. Hunts are primarily diurnal. Almost all households have dogs, many of which accompany hunters and are especially useful in the hunt of terrestrial game and some birds. To make them more adept hunters, dogs are generally starved the day before the hunt, and young dogs are trained by being brought out to the hunt and fed the blood or heart of prey. The men's fathers and grandfathers used dogs as well. Of the half of the households in Tiguano who hunt, the frequency of these expeditions has declined, from a median of about twice a week to 3 times every two weeks. The duration of hunts was found to be a median of 6 hours per trip, and has not changed over time. The distance of hunts has increased slightly, from a median of 2km in the past to 3km now. About three of ten attempts are unsuccessful, with hunters returning empty-handed or with a paltry amount of game. The most successful hunts are those in which they kill peccaries, or many different birds (toucans, Cracid birds). About half of the respondents have used traps at least a few times. The type of trap depends on the desired game animal. In terms of where people go on hunts, there are many trails throughout Tiguano lands, and most people have their "own" paths, some of which are the trails leading to their gardens. Some people do not do anything special to decide when or where to hunt, but three specifically said that they decide based on their dreams.

The post-hunt data are the most scant for the Shuar community of Tiguano, as the residents themselves admit that they do not hunt much at all, focusing more on market-oriented activities. Ten hunting trips, encompassing 21 animal encounters, were recorded, of which 14 animals were captured, giving a kill versus encounter ratio of 0.67. This small sample size includes three Collared peccary (*Tayassu tajacu*), three acouchies (*Myoprocta* sp.), two squirrels (*Sciurus* sp.), one Woolly Monkey (*Lagothrix lagothricha*), one paca (*Agouti paca*), and two other unidentified birds (*pajaro valiente*).

In Tiguano, hunting is not strictly limited to men. Some women kill animals that wander into their gardens. Several women also go hunting with a dog, machete and a stick, searching for small game

such as pacas or agoutis. On other occasions, women accompany other family members on hunts. Like the men, most women reported a decrease in the frequency of hunting, and said it is necessary to walk farther to find anything. The average trip is 6-10 hours and more than 4 km from home. Many times women's hunts are unsuccessful. "A lot of wasted time," said one.

There are many animals that the Shuar do not eat, including anteaters and jaguars (although they may be killed), and among birds, hawks (*gavilán*), owls (*lechuza*), and buzzards (*gallinazo*). On the other hand, some people now eat tortoise which was not eaten before. One person now eats caiman (*lagarto*) and rays (*raya*) from the river. Another, however, is still reluctant to eat animals which were not available in his former home in Morona Santiago, including tapir, agouti, and Woolly monkey (*chorongo*). Some households continue to not eat snakes, deer, *zorillo*, coati mundi, or sloths, but snails, frogs, ants, toads, and worms are eaten (the *mayongo*, or palm grub, is a significant part of the diet for some households). Other animals that are eaten now but not before include: tapir, primates like *mono chorongo* and *mono negro*, and birds such as *paujíl, pava,* and *trompetero*.

Unlike hunting, which is largely the domain of adult males, fishing is done primarily by Shuar women and teenagers. Men fish but not as frequently. Most people start fishing between the ages of 10 and 16, with 10 being the median age to start. Unlike the Quichua, who use a multitude of fishing techniques (including dynamite, weighted nets, and harpoons), the Shuar use only two methods: hook and line (*anzuelo*) and fish poison (*barbasco*). The hook and line was used by only about half of the parents of the respondents, and none of the grandparents. It is considered hard because of the patience required. A good yield from a *barbasco* expedition is thirty pounds of fish, a bad yield only 1-3 pounds. The informants do not report seasonality in fishing; these techniques are used all year. When the location for fishing is nearby, most everyone goes alone, but sometimes a husband and wife might go together, or a group of siblings or other family members. In the summer, the president of Tiguano organizes a group trip to a bigger river, and the catch is divided equally. Unlike hunting, fishing is less prone to unsuccessful days in which people return empty-handed. Many respondents said that they have never had an unsuccessful fishing trip; when asked how many fishing trips out of 10 were unsuccessful, almost 60% (7 of 12 respondants) said zero, and the rest said one or two. None of those surveyed prefers hunting to fishing, two-thirds say that they prefer to fish, and the rest have no preference. Fishing is seen as easier. In terms of what they prefer to eat, two people said fish, two said game, and the rest said both equally.

As with hunting, participants were asked about changes in the frequency and duration of fishing expeditions. Similar to the hunting questions and responses, no clear pattern emerges. There is a slight decline in fishing frequency, from a median of once a week to once every two weeks, but fishing trip duration has increased slightly from a median of 4 hours to 4.5 hours.

The Shuar in this project were asked about plants they gather from the forest. Four of the 12 households do not collect anything from the forest. The others gather *caña agria*, *cacao de monte*, *capulí de monte*, *uva de monte*, mushrooms, *morete* palm fruit, *chapil*, *catapo* vine, *granadilla de monte*, *aleja*, *ungurahua*, *col de monte*, palm grubs and *uña de gato*. These items are used for food, medicine and construction, and are harvested year around, although fruits are most available in February and March, and mushrooms, in January. The input/output household dairies from Tiguano registered 73 nonedible forest products which were collected on 15.7% of the 413 household–days. Of these nonedible products, 87.7% are plants, 5.5% resins, 5.5% animals and 1.4% other. The uses of these products are as follows: 56.9% for medicine, 15.7% for construction, 9.8% for fishing, 5.9% for sale, 3.9% for handicrafts, 3.0% for firewood, 2.0% for agriculture, and 2% for other uses. There are no community rules regarding the collection of these items. A machete is often used, although many things are harvested by hand. It is common for trees to be felled to collect its fruits.

Speaking of felling trees, half of the households said that they have never sold wood. They only chop down trees to clear land for their gardens, and less frequently for the wood to build a house or for fuel. The species preferred for construction are *sangre*, *pambil*, *arenillo*, *coco*, *canelo piedra*, and *lotería*. The most desirable tree to sell for lumber is tropical cedar, or *cedro*. People also sell *chuncho*, *sangre de gallina*, and *canelo*, but they do not get a very good price since they sell to a colonist middleman. Several men made between $400 and $1000 in the past year selling wood, and used the money to buy chainsaws (three individuals in the community currently own them), cattle, food, clothes and liquor, as well as pay for the services of a *curandero* (shaman). The wood is collected and sold from individual *fincas*, not communal lands, and sellers do not have to ask permission from the community to sell, nor do they give anything to the community. Of the six who have sold wood, none has more than a three-year history of selling trees, indicating the recency of the phenomenon.

For all these natural resources—game, fish, non-timber forest products and wood—we ascertained people's perceptions of scarcity. In regards to animals, informants said that their favorite animals to eat are pacas (*guanta*; the majority's favorite), peccary, tinamous (*perdiz*) and Woolly monkey (*chorongo*). Animals particularly hard to encounter now are peccaries, tapir, paca, tinamous, Cracid birds (*pava*), and Woolly monkey. Fifteen years ago, when they first arrived in Tiguano, there were more animals than there are now, but these Shuar came from areas largely devoid of game. Most people said that there are still a lot of animals around Tiguano, and that it is easier to hunt here than in many other communities, including the communities from which they originated. People also said that there is enough fish around Tiguano, except for streams close to dwellings where the oil company contaminated the water. Overall, most said that there are fewer fish now than 10 years ago, or even one year ago before

the oil company came. Those who came from Morona Santiago said that even now there are more fish in Tiguano than from where they came.

In terms of non-timber forest products, one person said that some resources are harder to find, though a more common response is that everything is very close, and that you do not have to go far to collect things. The tree species considered scarce is *cedro*; everyone said that it is now hard to find, that one has to go further in the forest to find it. No one plants trees for reforestation.

Before talking with people about their ideas about and practices concerning conservation, we asked them to tell us what their definition of a "healthy forest" is. A healthy forest has no car noise, contamination, or oil wells; the waterways do not run with oil; there are no loggers; and there is an abundance of fish and game. It is a forest that has not been "worked" (heavily cleared). One person said that it is "virgin" forest, one that is guarded and reserved. It is perceived that there are only advantages of having a healthy forest, and the reasons given by the Shuar are mostly utilitarian: a healthy forest is a source of fish, game, wood, and clean water, and provides shade from the burning sun. It is a reserve for the future, "for the children that are going to come later," and it contributes to good health. The problem, according to one, is that there "are people who want to use it all up now."

When asked for their definitions of conservation, a third said that they do not know, or had not heard the term. The rest give short responses: to conserve is "to care for," "to protect," "to guard," "to not cut trees in the forest," "to not use things in a brutal way, use only what is adequate." When asked if conservation and maintenance of the forest is important, everyone said yes, and the majority gave utilitarian reasons such as to have many animals to hunt, or to have wood to sell. However, not all reasons pertain to current human use; some said that maintaining the forest is important for future generations, as a "reserve" because the children and grandchildren will need it for the future. One person's response differs from others because it touches upon what some term the "existence value" of the forest: "…also for children so that they can know the forest, thus we should not destroy much of the forest, should not take out wood, should not hunt much so to not finish the animals. When I was a child in Morona Santiago I used to hear the names of some animals that no longer existed there, and when I came here I knew them." When asked what the role of humans is in the natural environment, most residents said that they do not know, but four responded. One said that humans are there to use resources, especially animals, but the other three have a component of stewardship in their answers: "we have to care for the forest;" "we should not work the land excessively to not destroy it, but only do what is needed;" and "we should capture animals in moderation, as the forest becomes poor if all the animals are collected." But what do people actually do to maintain resources? Of the ten people who responded, two mentioned working the land only to the extent necessary, one said that he doesn't sell timber and doesn't

hunt excessively, and everyone else responded that they do not do anything to conserve. One man added, "We work the land to be able to give goods and better economic situations to our kids in the future."

Indeed people in Tiguano do work to provide for their children, but they also see that there is a chance of destroying the forest and leaving the next generation more ecologically impoverished. Only two of nine respondents said that there is no risk of ecological destruction because there still is a great deal of forest; the rest said that more of the land will be "worked" with crops and cattle, that increasing human population will eliminate plants and animals, that the continued exploitation of timber will be harmful, and that even the noise of the chainsaw will drive animals away. "That is what happened in Morona Santiago, when they eliminated the forest," said one. Similarly, seven of nine respondents said that as a result of these pressures, their children will not have the same natural resource base in the future as they have now. "As happened in Morona," stated one informant, "with time, all land will be worked."

As illustrated in the following complaints, in the eyes of many residents, the culprit behind this gloomy ecological picture is not the community of Tiguano, but the oil companies: "The oil companies are destroying and contaminating the forest." "The air smells like the oil well and is making people sick. The streams near the oil operations are devoid of fish and snails because the water is contaminated. The noise from [the oil companies'] machinery and cars causes animals to flee, and with seismic exploration they are 'biting' the land [drilling holes and detonating explosives along seismic lines]." "They cut useful trees to build platforms and then render the land useless for agriculture." "People are contracting malaria [as a result of forest clearing fostering mosquito populations] and the children have diarrhea [from water contamination]." People emphatically stated that the oil companies need to make reparations for these damages through community projects that address these problems, such as potable water systems, or simply monetary payments: "It is necessary to collect for the damages that the oil company has done." However, some said that reparations or not, it would have been better for the company to not have been allowed to enter, and that they will not allow others in the future to enter. One person added that the damage is already too advanced; even if the company left, the area would remain polluted. "There is no solution because we are already affected," he said. Another stated, "The oil company produces an environmental impact. They try to take advantage of the riches [petroleum] and don't care about people or nature." Many residents said that "only the companies pollute." However one Tiguano resident noted that, while most of the contamination is done by the oil companies, the people of the community also contaminate: "They don't use the land well, burning is a form of pollution, they use poisons to fish, fumigate crops with chemicals, throw trash wherever, do not have a drainage system for human wastes. The people do not know about these forms of contamination."

Shuar Perceptions of Outsiders and Aspirations for the Future

Shuar residents were asked about the types of outsiders with whom they come into contact, the activities of these outsiders, and how they feel about them. In Tiguano during 2001, the oil company Vintage was a new and constant presence, drilling a well in community territory next to the road. Petroleum representatives passed by the road every day and visited the community regularly. These representatives came to ask for permission to exploit Tiguano lands. In return, they gave small gifts such as notebooks for the children, gas for gas-powered tools, sheets of tin for roofs, medicine, and tools on their regular visits. They also assisted in the construction of a school cafeteria and latrines. Some people said that they like the petroleum company because it provides food, services, and work, but others said that they did not like its presence in the community at all.

Researchers from Ecociencia also have had a presence in Tiguano. They came three years ago (in 1998) for four months to collect and learn about plants in the area. They gave the community $300 and children's furniture for the cafeteria. There is some tourism in Tiguano as well, for instance an organized trip arranged by an Ecociencia employee to enjoy traditional Shuar dance and song. Most found the tourists' visit agreeable, and said that it was interesting to see outsiders who looked different. Other outsiders who visit include missionaries and representatives from the Shuar Federation. Colonists and other indigenous people come during the community's fiesta. One person mentioned that the colonists bring problems when they come, but did not elaborate. Some people like it whenever anyone comes to visit the community: "Yes, it is good that they come because then it's possible to know other people;" and "Yes I like it. It is good because they teach us." Others do not agree: "[I don't like outsiders] much because they all come to take advantage of us, they have not left anything for the community and they obligate us and put pressure on us and only then when we agree do they give us [sic]." Informants were asked if people outside the community are different from those in Tiguano. Everyone responded yes, but the reasons given vary: their customs and foods are different, they are rich and eat well and have stores; people from towns are more united and together, and have more money and more things to spend it on. In contrast to outsiders' preoccupation with money, people in Tiguano engage in much more sharing and giving away of food to each another. "In the towns no one gives food like here."

Residents were asked what kind of help they most need in the community. Money is the most common response, both personally and for the community. More specific needs include more livestock and seeds, sheets of tin, tools, gifts for the children, and technical assistance. For the community, they want roads, outboard motors, potable water, a communal house, a medical center, first aid kits, and an electric generator.

Residents were also asked to give their definition of "development." Many mentioned the notion of "progress," making things better, working, and moving forward, either personally or communally;

three persons said that they do not know. Some view development as raising domestic animals, which is not surprising given the Shuar's history. For one man, caring for animals is development. People speak of having more cattle, more chickens, more pigs, more coffee, and money in case these animals fall sick. Having animals is equated with having money for clothes, health, family consumption, and credit in the bank. Other things associated with development are appliances such as radios and televisions, pots and pans, refrigerators to preserve food, electric generators for nighttime meetings, and chainsaws to cut wood to sell. Development is equated ultimately with money, because "without money you can't move forward, you can't buy what you need to feed and maintain yourself." For some, development "is all good, there is nothing bad" and "it cannot make life worse." Others mentioned some possible disadvantages, including fights, envy, gossip, and drunkenness, as well as loss of the culture. As an illustration, one person said, "In 5 years no one will make *chicha.*" For most of the Shuar, development is something they are striving for, but for one woman, it is something they have already achieved: "Before, the Shuar did not speak like the colonists, were not familiar with schools, married their daughters away at very young ages. Now it is not like that."

We asked the Shuar of Tiguano what they think of roads and markets, and to compare the benefits they bring compared to the benefits of an intact forest. Roads and markets are considered beneficial because they make it easier to sell coffee and lumber. It is also easier to go to town to buy things, and to get medical treatment in an emergency. Buyers and venders come to the community, making it unnecessary for people of Tiguano themselves go outside the community. Access to markets and the opportunity to make money is seen as the biggest benefit. But three residents are aware that there are disadvantages as well. In the words of one man, "Single women leave to find employment in the city; before this did not happen. Outsiders see that there is much forest here and they want to invade. There is danger that strange people enter. There is danger for those who live on the road, for children especially, since they can be run over by the cars. The oil workers also do not have respect for the women." Another person is worried that strange people could come and steal cattle or other things. Someone else said that outsiders may come to steal or assault residents, and that with a road, the youth can escape from the house. So what do people value more, forests or roads/markets? Of those who answered this question, three households see the forest as more important, one thinks the road is more important, and four see both the forest and the roads as being necessary, not acknowledging the tradeoff that the latter can lead to the destruction of the former.

Residents were also asked if they thought it was possible to live without money. Can they envision living outside of the market economy? One person gave a pragmatic answer, "In the rainforest it is possible to live without money, but to buy ammunition for your gun and to go to the hospital and to school you need money." Another person said, "It is not possible to live only from the forest, it is

necessary to get money. Because of this, it is necessary to cut the forest and work it with crops and cattle. We need money for education and other things. We have to do this to support ourselves. If we have money, we will not suffer, nor have to sacrifice to get food."

Informants were asked about their perceptions of the city (based mostly on experiences of the town of Coca) and if they would live there. A couple people do not like the city, saying that it is hot, boring, dirty and expensive ("everything is money"). Moreover, they do not feel secure in the city—there are assaults and killings, delinquency and violence. However, most people said that they feel good when they are visiting the city, that it is entertaining and there is much to do. The houses are close, people travel in cars, there is fruit, music, and lots of lights. Ten of twelve respondents, nevertheless, said that they preferred to live in the forest. The other two said that they thought the two options were about equal in their minds. However, if they had enough money, the latter two and three others would move to the city. One said that in the city you need a lot of money, every day, so if he had money then he would go. A few said that they just did not like the city—the forest was fresher, there was less concern for money and less noise.

Residents were asked if, compared to the last place they lived, life in Tiguano was better. The respondents came from several different places; many came from Gualaquiza and San Antonio in Morona Santiago Province, but others came from Kenkum, Sakamas, and Kunkuk (nearby along the Shiripuno River, downriver from the Huaorani villages studied). Everyone feels that Tiguano is better than those places because there is more land, and the land is generally of slightly better quality. Other important factors are that Tiguano is next to a road that facilitates transport of agricultural products to market (to Coca) and has facilities to dry coffee. The last place they lived was further from the road, near a river that would flood, and the houses were farther apart. In Tiguano there are more palms, a stream, less sickness and fewer snakes. Two respondents differ with the majority: one thinks that it was the same as the last place and the other feels that it is too hot in Tiguano.

Our assessment of people's aspirations is intergenerational—both their desires for themselves and for their children. People were asked what they would like to eat more and less of, and about their consumption aspirations. They responded that they want to eat more meat, and some specifically said forest game. Also cereals and grains are noted, and a few said they want to consume more of "everything," more food in general. Although most did not say what they wanted to consume less of, three people said that they want less food from town, less store-bought food and rice. This is interesting because for most indigenous groups, purchased foods are highly esteemed. In terms of consumption aspirations, people want to be able to buy more beef, cereals and grains, rice, potatoes, beans, lentils, noodles, canned foods, cheese, forest meat, and fish. The items most desired for the home include radios, sewing machines, beds, carpentry tools, a chainsaw, pots and pans, a stove/oven, television, water tank,

shotguns, outboard motor, and domestic animals to raise. Things desired for personal consumption are unanimous: clothes, shoes, camera, and hair accessories, and one said an "elegant $100 watch." For children, people want to buy clothes and shoes, medicines, "a bicycle for my son," or simply "whatever they want."

Looking ahead to the future, adults were asked what their educational and occupational aspirations were for their children. Parents generally said that they want their children to attend school at least through sixth grade (to complete their primary education). Three said that they want their kids to finish *colegio* or secondary school, and two aspire for their children to attend a university. In terms of employment, Shuar boys begin to earn money between the ages of 14 and 15. Most parents want their sons to have salaried jobs. Some think that starting at 14 with the oil company is a good idea because it pays relatively well, but others want their sons to wait until much later, until at least age 18. There is a pretty even split between those who encourage taking jobs with the oil companies and those who think it should be avoided. Most parents want their sons to become professionals in the long term, though there is also a preference to have them remain in the community to work a *finca*. This is a source of tension in families and within individuals. The options for girls mirror the jobs that women have actually had. Most girls in the community start raising animals at an early age, and some begin making money as early as 14. But there seems to be a movement away from this, which is common among the older women, and towards wage labor for their daughters, to have a more steady income to buy things. Some women had spent a few years as a cook or nanny in the city, and some mothers think their daughters should do this if they do not stay in school to become professionals. However, the fundamental role of women is still seen as raising a family.

Overwhelmingly, people said that they want their sons to stay in the community. The only exceptions are a person who wasn't sure and had very young children and a couple who had no sons. The rationale is that there are no farms in other places, and someone has to take over their *finca*. "For my son to take the farm is why I work so hard," one man says. Moreover, it is good to be close to one's family in case of sickness or mistreatment by the spouse. For daughters, there is more openness to her making up her own mind. This is because Shuar residence patterns after marriage are patrilocal, so the practice of daughters moving away at marriage is more accepted. Thus when the daughter forms a household and has children, she may go. While they prefer for their daughters to remain close by because there is land here to farm, they say that it depends on the daughter. Respondents did express a preference overall for the daughter to stay close, so her parents could visit her.

Even if their children stay in the Amazon region, what will their standard of living be like in the future? Two people said they didn't know ("only God knows"), but everyone who answered the question agrees that their children will not live in the same way that they are living now. Some believe that the

lives of the next generation are going to be more difficult; for instance, their children are going to have more economic problems, and that "life is going to be more expensive because of the influence of the oil company and dollarization." Many feel the youth will change through education, as is shown by the following comments: "[they are] going to study and advance their lives, not going to be like me;" and "they are going to prepare themselves, to study and have other ideas." People predict that as the youth become educated and professionals, they will move to the city, will modernize, and can be "like some of the professional indigenous people who work in institutions or are leaders." One man gave this prediction for the future: "With time they [Shuar youth] will think like colonists, will want to live like them, to have more money. They will not be totally the same as them, but will be very similar. At least they will go to the outside because now some already think that it is better to live in the city."

THE HUAORANI

[Principal Investigator Richard Bilsborrow with elder Huaorani gentleman. Photo: Flora Holt]

Numbering approximately 1,400 individuals (Rival 2002), the Huaorani (formerly known as *Auca*s) are considered the least assimilated of Ecuador's indigenous peoples. Their language, *huao tededo,* is categorized as a linguistic isolate, and the Huaorani are often envisaged as wearing large balsa wood earplugs (although now only the elders have the distended earlobes, and rarely wear the plugs). Formerly called *Aucas* (Quichua for "savages"), the Huaorani have been confused with Zaparo and Aushiri Indians, for whom this term was applied as well, and the historical record of the Huaorani is scant. It is clear that they are people of the upland forest, who were not adapted to living along larger rivers such as the Napo and Aguarico: many fish species were taboo to eat, and they did not build canoes and had few methods for fishing.

However, beginning in 1958, sustained, peaceful contact was established with the outside world through the efforts of the missionaries with the Summer Institute of Linguistics. Before that, about 500 Huaorani controlled a territory of 20,000 square kilometers, bordered on the north by the Napo River and the south by the Curaray River. These borders were maintained through unpredictable spearing raids of

cowode, the Huaorani term for any outsider, literally translated as "non-human cannibal." A reputation for violence has continued to the present day, as it is believed that two sub-groups of Huaorani, the Tagaeri and the Taromenane, still refuse peaceful contact and will spear intruders. Avoiding outsiders, however, is increasingly difficult: the Huaorani currently have legal title to around 6,000 square kilometers, and this area is witnessing the invasion of petroleum companies. The description here combines information from two Huaorani communities, Huentaro and Quehueiri-ono (17 households, 110 individuals combined). Quehueiri-ono and Huentaro are linked villages; the former was established in the late 1980s when a group of Huaorani residents left the community of Dayuno. Huentaro has been around for only about 8 years, having split off from Quehueiri-ono[3].

Huaorani Demographics

The two study communities are very young populations, with 58% of males and 53% of females below the age of 15**,** with a sex ratio of 1.1. In Quehueiri-ono, 37% of residents were born in the community, and in Huentaro 28% were born there. The Huaorani's relatively recent exposure to the outside world is seen in their language patterns—there are no monolingual Spanish speakers. About 20% of the sample speaks only *Huao tededo* and 80% are bilingual with Spanish, although Spanish ability is rudimentary for many.

The Huaorani lack rigid rules for marriage—monogamy, polygyny, and polyandry are all acceptable, although the last is rare. In this sample, all unions are monogamous except for one case of sororal polygyny (i.e., a man marries sisters). About a quarter of the unions are "*union libre*," with the rest reported as marriages recognized by the state. When asked whether their marriage was arranged, 7 (64%) of the 11 women who answered said yes. This is the first marriage for all the women in households ever in union. The mean age at which women married is 18.8 years, with a median of 17.5. Of the 17 household couples in this sample, six are marriages between Huaorani and Quichua (in four of those cases, the wife is Quichua) and one Quichua couple residing in the Huaorani community of Quehueiri-ono are the parents of one of these Quichua women married to a Huaorani man. Among the Huaorani, marriage to a Quichua person (but not to other indigenous groups) is not uncommon. It is seen as a way to make alliances with a group with more knowledge of and contacts with the larger society; at the same time, for the Quichua, marrying a Huaorani opens up a large natural resource base. When asked about their wedding ceremony, many responded that they had the quintessential Huaorani wedding: a

[3] In the mid-1990s, very few families lived in Huentaro due to the lack of a school. Some maintained a main home in Quehueiri-ono but had some gardens in Huentaro that they would visit frequently. Now, with the establishment of a school and landing strip in Huentaro, giving it the same main infrastructure as Quehueiri-ono, there is less moving back and forth and the residents of the two communities live largely separate lives, although there is still frequent contact since they are only about two hours apart by foot.

fiesta is held, the couple are thrown together in a hammock by matchmakers while everyone chants, and the marriage is formalized when the woman makes *chicha* for her husband and he goes to hunt for her. Every respondent recalled, often in great detail, the food they served at their fiestas: copious quantities of meat are a requirement, but for the Huaorani men who marry Quichua women, purchased outside foods are also important.

Linked with marriage, of course, is having children. In these communities, it is not uncommon for women near the end of their reproductive lives to have had eight to ten children. Women were asked how many children their mothers and grandmothers had had. On average, their mothers had 7.7 children, and grandmothers had 7. Nine of the 14 women interviewed on these questions said that they do not want to have any more kids; those who do want more are generally recently married. Among a few of the informants who stated a preference for the sex of their children, boys tend to be preferred—they hunt and fish, and stay in the community when they get married. This is a natural fertility population: the Huaorani women are not familiar with any Western contraceptive methods, and do not even use natural methods, saying this is dealt with by shamans, who are believed to have the power to cause or cure infertility. On the other hand, the Quichua women in the Huaorani communities know about a variety of contraceptive methods, such as *uña de gato*, mixed with *chuchuwasa* and aralen (the anti-malaria prophylaxis). Only one woman knows about a modern method, the pill (although she had not used it herself).

Breastfeeding is universal in these communities. In Quehueiri-ono, women breastfeed from seven months to two years (most about one year), whereas in Huentaro, respondents stated that they breastfeed longer, from two to four years. The only instances in which the mother does not breastfeed is when she is not producing milk normally, in which case another lactating woman in the community may breastfeed the child or formula will be used (the perception of the authors is that the latter option is slightly more common). Breast milk is considered good for children, helping them grow quickly and keeping them from getting sick. Children begin to eat supplemental foods at six to nine months, when their teeth emerge. The most common food given is *chucula*, a drink made from ripe boiled and mashed plantains. Other weaning foods may include manioc, rice, fish, meat, eggs, and noodles. When children get diarrhea, women emphasize treatment with natural remedies, often *sangre de drago* (derived from the bark of a tree), unless it is very serious, in which case medical treatment is sought. They were not familiar with oral rehydration at the time of the ethnographic study in 2001, though most non-indigenous women in the *Oriente* are as a result of national campaigns to address the symptoms of diarrhea.

Mortality information is scant: 15% of the total of 116 live births of the women sampled were not alive in 2001. In regards to adult mortality, informants were asked why their parents or grandparents died. The majority of responses refer to witchcraft, or linked with that, warfare and spearing. Snakebites were also mentioned, along with fever and old age. These responses regarding the deaths of relatives in

the past are consistent with the findings of Yost (1991), who, based on genealogies going back five generations, found that over 41% of deaths were the result of spearing raids, 8% were homicides at the hands of outsiders, and 5% were due to snakebite.

In terms of education, 23 males and 22 adult females past schooling age were asked the highest level of education completed. Five (22%) of the males and four (18%) of the females do not have any formal schooling. Twelve (52%) of the men completed primary school (in this sample all men who attended primary school finished it), but 7 (32%) of females did not finish primary school, and 9 (41%) did. Six males (26%) started secondary school, but only two completed it. Only two females (10%) went on to secondary school, and one finished. In these Huaorani communities, parents reported that children attend school five to six hours a day, five days a week. However, these schools are small, have limited scholastic resources, and on occasion the teachers take long (multi-week) absences; thus, in fact, children often do not attend regularly. One woman said that her daughters "don't go when it rains, when they are sick, when they don't want to." Reflecting the strong individualism in Huaorani culture, few parents are strict about making their children attend school.

About 80% of the residents in these two Huaorani communities reported themselves as religious, the vast majority Evangelists but a few Catholics. But in at least some of these responses, it is questionable whether people actually possess a religious affiliation, or just feel uncomfortable saying otherwise. In fact, most reported that their last attendance at a religious service (often held in the school, as there is not a separate building dedicated as a church in these communities) occurred two to seven years ago. In Quehueiri-ono, since the landing strip has been out of commission for the past few years, religious representatives have not entered in a long while and people are becoming "more distant toward religion." Residents from both communities mentioned that missionaries help with flights (e.g., medical evacuation), food, uniforms for kids, and school supplies, and that they offer religious retreats for children in places like Quito or the coast.

Questions in the demographic interview also ascertained information about migration and mobility, revealing that the founding of both Quehueiri-ono and Huentaro was due to conflict. People in Quehueiri-ono said that they came from Dayuno foremost because of social conflicts, but also mentioned being motivated to leave due to a paucity of arable land and game. For most of the households, the male head of the household made the decision to move. Huentaro residents said that they moved away from Quehueiri-ono due to social conflicts involving a powerful Huaorani man. In these cases, either the male head of household or the entire family together made the decision to move.

The Huaorani in the two sample communities are originally from a variety of places in Huaorani territory. Historically, they were seminomadic, and the hostility among different subgroups led to dispersed settlement patterns. When asked why people in their community moved in the recent past, the

most common reasons reported are: conflict with other family or community members; to be near roads; to pursue work; and to be nearer to a market. Between the period of 1997 (when one of the authors (F. Holt) conducted her dissertation research in these communities) and the 2001 NIH data collection, at least three or four Huaorani households formerly residing in these communities moved westward to a community closer to the Andes called Gareno, which is along the road to the provincial capital city of Puyo and near oil company operations. It draws some Huaorani like a magnet, with visions of petroleum company handouts, employment, and bounty. Residents who stayed in Huentaro said, "They left because they wanted to live by the road. They live badly there, because they have problems with the oil company…every so often there is a strike, because they want the company to give them food and they don't. They want the company to give them everything in Gareno." Unlike the Quichua families surveyed, who often cite education as a reason why they *leave* the community, the Huaorani invoke education as a reason why they *stay*, the difference being that few Huaorani pursue education past primary school. Other reasons the Huaorani gave for staying include: proximity to family; tranquility of life in the community; reluctance of children to move; expense and danger of the outside; and access to natural resources such as game and fish. Also if they left they would have to plant new gardens and be hungry while crops matured. Residents were asked about their mobility—why and how often they take trips. Most commonly, people go to town (Coca) or visit other communities once a month to engage in market activities, see relatives, and attend fiestas. Only one family, led by a Quichua man, said that they go to town to collect their *bono de pobreza*, which is $20 per month given to poor families by the government. About half of the families report having a second house; in the case of the Huaorani, it is a place to sleep along a trail during long hunting expeditions, while for the Quichua living in these Huaorani villages, it refers to a dwelling in their previous community of residence before they married into Huaorani territory (e.g., Caspizapa, Paraiso, Santa Rosa).

Huaorani Social Organization

Before the advent of sustained missionary contact and the sedentarization that it entailed, the basic unit of the Huaorani social organization was the *nanicabo*, a residential unit of 30 to 50 related kin living in a thatch-covered longhouse. It was economically self-sufficient and autonomous. Typically, a *nanicabo* was composed of an older man (for whom it was named), his wives, one or two married daughters and their husbands and children, his unmarried children, and one of his brothers and the latter's family. The preferred marriage arrangement being uxorilocal, married sons rarely lived with their parents (Rival 1992). In response to the prevalence of warfare and spearing raids in the past, the longhouse residence pattern was characterized by mobility; every three or four months, the family would move to another location where they had planted gardens, thereby making themselves less susceptible to attacks

by enemies. But nowadays, most communities are comprised of nuclear families living in a nucleated settlement pattern, characterized by dwellings centered around a school and perhaps a landing strip. In contrast to the *nanicabo*, extended kin tend not to live under the same roof, settlements are more densely populated and permanent, and non- or distantly related-kin now live in relatively close proximity.

Huaorani political organization can be described as egalitarian and individualistic. There are no chiefs or headmen born into positions of power, gender roles are flexible and both genders equally valued, and one person cannot impose his or her will upon another. With the advent of formal schooling and sustained contact with outsiders, however, this political organization has been hybridized with an external one that values hierarchy, compliance, and the will of the group. There are now community leaders: a president, vice president, secretary, treasurer, and the head of the *padres de familia* (an organization comprised of the parents of schoolchildren). As one informant states, "The community exists to live together and work and have the school. They are committed to having a united community, almost like whites, to have kids in school…the children have to learn." The leaders maintain the support and upkeep of the school and landing strip by calling for *mingas*, seeking community improvements, and dealing with outsiders. With populations as small as those in Huentaro and Quehueiri-ono, the same residents are elected time and again to leadership posts. In Huentaro, every year a new *padres de familia* president is elected, but, unlike the other indigenous communities in this study, the other posts do not change "because there isn't anyone else." The president in Huentaro is the one who arrived first, the founder of the village. The members of the villages (people over the age of 15 who are Huaorani or married to Huaorani and reside permanently in the community), elect community leaders by majority vote. As one informant puts it, because all residents are related kin, there is no concept of *socio* (member) as among the Quichua or Shuar. Residents are required to participate in *mingas* (although unlike among the Quichua villages, non-participation does not result in being fined, it is just grumbled about), and can use community territory for hunting, fishing, and gardening. *Mingas* in these two study communities are used to cut the grass on the landing strip and the area around the school. In Quehueiri-ono, *mingas* are held every three to four weeks, last for 4 to 5 hours for as many days in a row as are needed to finish the task. In contrast, in Huentaro, *mingas* are held generally every Wednesday for a few hours in the morning.

In terms of property ownership, the Huaorani emphasize that the "territory is open" for those belonging to their ethnic group or those married into it. They have a common property regime with a twist: a well-delineated group of users (Huaorani and spouses) have access to a well-defined resource unit, and users share joint, nonexclusive entitlement to the resource prior to its capture or use. In other words, the land, animals, and other resources are held in common until someone "captures" the resource, e.g., spots the animal, discovers the edible fruits, plants the crops in a certain *chacra*. The Huaorani say that one is free to plant a garden wherever, to hunt whatever animal using whichever trail, and to use any

fishing method. But once that garden is planted, the animal hunted or the fish caught, those resources are owned privately and others have to ask to share part of it. To maintain good standing in the community requires that people do not steal, pilfer, connive or cheat others to get these resources; such respect for social boundaries are inculcated as part of the socialization process. Unlike the majority of other documented common property resource regimes in the anthropological literature, however, the Huaorani do not have explicit rules regarding user rights and duties to one another about resource extraction; instead, they have *implicit cultural understandings* about social boundaries and respect for the property of others (Lu 2001). They say that there is communal land title among all the Huaorani people to 612,560 hectares which can be used for hunting, fishing, agriculture, logging, handicraft production and tourism. In each Huaorani community, land is held communally, as are the school, first aid supply, community canoe, lawnmower, and chainsaw.

In terms of interhousehold exchange, it has been said that for the Huaorani, to deny someone food who asks for it is basically to negate any type of relationship with that person. Sharing of food, especially when someone comes over to visit, is central to Huaorani values. Game, fish, and *chicha* are shared the most, along with garden produce; less commonly shared items include purchased foods such as rice, gathered foods and ammunition. One respondent said that they give raw meat if there is a lot of it, or a plate of already prepared food if there is only a little. Women whose husbands are away for a long time are recipients of food, especially meat, from kin or neighbors. In Huentaro, where residents are all closely related, food is shared among all households multiple times per week. This is the same with some households in Quehueiri-ono, although some families complain that sharing does not happen normally, only when people visit.

Huaorani Household Economics

We first discuss the standard of living and dietary patterns, then involvement in market activities, and cultural values surrounding wage labor. These Huaorani communities do not have electricity or running water. About a third of the households use a latrine for human waste disposal, with the rest using the river or stream. Water for drinking, bathing, and cooking comes from a stream, river, or rainfall. Water is collected for the family with a median frequency of twice per day, most often by the spouse of the household head and occasionally by their children, and the source of water is around five minutes away. For fuel, all households use firewood, but about a third also have propane stoves for cooking. Women do the bulk of the firewood gathering, but a few households reported that the men help as well. In terms of median values, this task is done three times a week, from a fuelwood source 30 minutes away.

What do the Huaorani of the two sample communities eat? A dietary checklist was included as part of the household input/output diary form, and 1,112 household-days were recorded. What it tells us

is that the Huaorani still rely heavily on forest game: 69% of the days witness the consumption of meat from hunted animals, whereas eating domestic or purchased meat occurs only on 4% of the days. Forest fauna are more important to daily consumption than fish, as fish were eaten on only 51% of the days. Of course, the balance between hunting and fishing is seasonal, depending on rainfall. The strong preference for eating forest game is seen in people's responses to questions about their favorite foods and what they like to eat each day: people mentioned *carne de monte* generally and specific animals, such as "fat monkey," peccary, and deer. They like to eat meat everyday, such as pacas, agoutis, birds, peccary, and monkey, with manioc and plantains. The Huaorani eat eggs about 14% of the time, and eat grains and manioc virtually every day (90% of the days). Fruits, predominantly plantain and bananas, are also eaten on 90% of the days, but vegetables are consumed on only 10% of the days, and nuts and seeds, 15%, followed by insects at 3% and dairy (e.g., powdered milk) at 2%.

Families eat throughout the day, typically three or four meals. It is unusual for a family to eat only one meal in a day. *Chicha*, which is not considered food but is an integral staple of the diet, is taken five to six times per day. One household gave an example of its daily food consumption: a meal of plantains and *chucula* is eaten first, in the morning, followed by a mid-day meal of meat, manioc and plantain, then one at night of *chicha*, plantain, and fish. Men typically eat first, although some households mentioned that the children eat first because they are the hungriest. Going to bed hungry, however, is not uncommon, as most households reported it occurring recently, within the last few months. This may result from being *en route* traveling, being away from home, or coming back late from a hunt. Another type of dietary hardship occurs when the male head of household is absent (e.g., due to wage labor). Women were asked how the diet of family members changed in his absence. The responses are similar: they eat less meat, and more garden produce and fish when he is not around. Some families are fortunate to have other men (e.g., brothers, fathers) to provide meat, or a son who will go hunting. Some women will get their machete and take the dogs out hunting, mostly in the garden.

All households surveyed purchase some food from the market, in places such as Santa Rosa, the bridge where the Shiripuno River crosses the *Via Auca* oil road, or the town of Coca. (The former is about 10-12 hours down river by non-motorized canoe, the latter another 2-3 hours by car or truck.) The most commonly purchased items are rice, noodles, sugar, oil or lard, tuna or sardines, condiments, oatmeal, powdered drink mix, beans, bread and vegetables such as potatoes. When asked why they buy these foods, most mentioned flavor, variety, and children's desires; one respondent said it is due to laziness, not wanting to go hunting or fishing. Most purchase food every 15 days or monthly, but a few only go to the market every two months. Women were asked if they would prefer a diet of all purchased foods if they could afford it. Despite a few positive responses (one woman said she would prefer it because her husband was recently bit by a snake while hunting), most say forest game is what they prefer

to eat. They like eating game and fish, and would miss this component of their diet. Some bluntly stated that the Huaorani "always have to hunt and fish," and "never could stop hunting or fishing."

When Huaorani men were asked what income generating opportunities exist for them, the most common reply is working for oil companies, although making handicrafts, selling game meat, tourism, federation work, and running a store in the community are also mentioned. We collected work histories for 10 men. Every single one has worked for oil companies, reflecting their dominance as one of the few ways Huaorani men can earn money. Of the ten informants, the average number of stints they had worked for oil companies was 5.5, with a median of 6. Some had had only two stints (including two young Huaorani, recently married, and a feeble, middle aged Quichua man) whereas a couple of strong, middle-aged Huaorani men had already worked 10 times for oil companies. Many different oil companies were mentioned, including CGG, Petroecuador, PetroCanada, Seiscom Delta, Petrobras, Harbert, Oryx, Geosur, Elf, PetroChina, Perez Companc, and Kerr McGee. Many men reported liking the oil company work, saying they were treated well, given room and board, received clothing and medical care, and that the work was easy. A few men complained that they were paid little, that the work was hard, that the captain treated them badly, and that they were docked for losing things. Their oil stints lasted one to nine months, with an average of three or four months. Of the ten men, seven had other work experience as well—four worked in tourism as guides, two Quehueiri-ono men sold lumber, one worked for an oil palm plantation, two worked as agricultural laborers for colonists, one had a store in the community, and one translated for the Red Cross. These non-oil jobs were sporadic, not as consistently available as working for the petroleum industry.

When women were asked about their possibilities for income generating work, they mentioned the manufacture of handicrafts and working as a teacher, health promoter (a community member who is trained in basic first aid), or maid. Of thirteen women interviewed, five had never done any type of wage labor but had sold handicrafts; and the only wage labor experience of another two women was helping construct the landing strip for their community of Quehueiri-ono, being paid a meager salary by the oil company Kerr McGee (as part of a community development program). Four other women had worked as domestic household employees in Quito, Puyo, Misahualli, and Limoncocha when they were teenagers. Finally, two women worked as health promoters (residents of the community trained to provide basic health care), one also had experience as a cook in a Puyo restaurant, and the other was the Quichua schoolteacher in Quehueiri-ono. At the time of the study, the schoolteacher was working, and three women in Quehueiri-ono had recently worked on the Kerr McGee landing strip project (but had negative things to say about it). The other nine women were not engaged in any current wage labor.

As discussed in earlier sections, agriculture (cash cropping) is one of the most important income sources among many indigenous populations such as the Quichua and Shuar. However, for the Huaorani,

this economic activity is very limited. In interviews with men, only one mentioned selling plantains at the Shiripuno River bridge (2 bunches for about $2.50 each), and had not done this in the past year. Another said in April, 2001, he sold two pounds of cacao in a Quichua community (receiving a little over $1). Other informants mentioned that they sold crops in 1995 and 1997, but the majority said that they have never sold crops. In addition, when women were asked, none reported selling crops. When fifteen heads of household were asked if they would like to sell crops, 60% said that they would like to sell corn, plantain, rice, coffee, cacao, and naranjilla. Corn is popular because it can be harvested shortly after planting. Of the other six who said they would not want to sell crops, half have no interest while the other three lament that the market is too far and there is a lack of middlemen to facilitate the sale.

In contrast, there is much more involvement in the sale of fish and game. Of ten respondents, seven sell meat, and five sell live animals, mostly in Coca and Santa Rosa. Animals frequently sold as meat include peccary, monkey, rodents, large birds, and deer. The sale of meat varies in frequency, with some households selling several times per month and others only a few times in a year. Annual income earned from the sale of fauna is about $100 to $300 for households who dedicate themselves to this activity. The households who sell live animals focus on monkeys and birds, but will also sell live caiman, tortoises, and baby ocelots. These sales happen sporadically and opportunistically; only one informant gave an estimate ($90) of annual earnings from the sale of live animals. Although one man said that there are a lot of animals, the same abundance as before, all the rest said that animals are now harder to find, they are more reclusive, the noise from shotguns drives them away, and one has to walk a longer distance to find them.

Timber and non-timber forest products are discussed below in the section about resource use, but brief mention is made here. In these communities, the most important commercial trees are cedar, *guayacan*, *guadua*, *arenillo*, and *tambor*. One resident of Quehueiri-ono reported selling wood to a logging company from Colombia, 4000 boards (*tablones*) of cedar at less than a dollar each. The wood was harvested from the community land, floated down the Shiripuno River and taken out at the oil road bridge. No other timber sales were reported by residents of Quehueiri-ono, but informants in Huentaro said that there had been quite a bit of cedar sold in Quehueiri-ono since they left it in 1997. Residents of Quehueiri-ono are supposed to obtain permission from the president of the community (some mentioned from the Huaorani federation as well) to sell wood, but in practice each person arranges deals for himself without notifying anyone, and keeps the money for himself. There are no sanctions by the community as a result, just grumbling by other residents. In Huentaro, none of the households reported selling wood, which seems accurate.

For many indigenous communities, handicrafts can be an important source of income. This is particularly true for the Huaorani. Of ten men responding, only three do *not* sell handicrafts. One of

these three men explained that he is not skillful at making them, so it takes too much effort. In Quehueiri-ono, there are close contacts with tourism agencies as a result of one of the men becoming somewhat of an international celebrity; thus some male heads dedicate themselves to manufacturing blowguns, spears, wooden machetes, baskets, and wooden knives for sale in the community and in Coca, Santa Rosa, and Nenquepari (a Huaorani community downriver close to the oil road). In Huentaro, men make blowguns and spears for sale to the occasional tourists who make it to the community. With the decline of tourism in Ecuador in 2001, however, it is doubtful that any household made $100 a year selling handicrafts, and many made much less.

When women were interviewed about making handicrafts, all but two said that they made them (the two who do not are Quichua). Bags (*shigras*), hammocks, and necklaces are the most commonly made items, and are sold in the community, in Nenquepari, and Santa Rosa. On average, women sell a handful of the smaller items (bags, jewelry) per year, and perhaps one or two hammocks, earning a total of $30 to $40. Some women said that they make items to trade within the community, for instance, in return for food (one reported trading a hammock for clothes with our ethnographer).

Besides handicrafts, another potential money-making activity in the domain of women is the sale of domestic animals. Of a dozen women interviewed, all but two raise chickens (a couple households in Huentaro have ducks as well). However, five families have only five or fewer chickens, while the other five have 15 to 40. These chickens are almost exclusively for domestic consumption—the eggs when available and the birds themselves only on special occasions. As is the case with handicrafts, sometimes chickens are used as barter between households.

Both men and their wives were asked about the acceptability of women participating in wage labor. Most men surveyed in Huentaro and Quehueiri-ono do not feel it is acceptable for women to engage in wage labor: it "damages" women to leave the community, they get bad jobs like domestic help, salon workers, or prostitutes, and return with illegitimate children. One man said that "women earn and don't give anything to the house." Women should be in the home doing domestic labor, working in the garden and caring for children. It is thus uncommon for the wives or daughters of the men interviewed to leave to engage in wage labor. One exception was the case of a wife gone for a brief time to work as a health promoter. One man stated that it would be acceptable for females to leave to become a secretary or teacher, but no one in his family had done so.

When women were asked this same question, most echoed the opinions of the men. It is not acceptable, they said. Women return pregnant, they can be raped or robbed, they are paid little, they leave and get other men. A few said that it is fine for a single woman, if the woman is leaving to study, or if she is leaving to work and not to walk the streets. Women were also asked if they want their husbands to work away from the community in wage labor. Interestingly, of the 12 women respondents, only two

said no, because it is dangerous and he could die, or he would bring back diseases, or that it is better for him to be home working and hunting to provide for the family. The rest said that they needed money to buy food, clothes, and medicine, things for the house (e.g., tools, sewing machine), and to have money to travel. When asked how much their husbands earned in all of 2000, only one woman provided an answer (her husband made seven million sucres, or about $280), perhaps most not knowing. Women were asked if they would rather have their husbands at home or away working. Eight (66%) prefer having him at home, while four said away working. The former group commented that life outside the community is difficult, and that he could also earn money while at home (i.e., making crafts or selling forest resources). The latter group said that he needs to make money to buy things (implying that wage labor is more lucrative).

Huaorani Agricultural Patterns

Here the general patterns of swidden agriculture will be described (including crop selection, fallow practices, soil preferences), followed by the use of external inputs, labor practices and inputs, and the raising of domestic animals. Finally, we will discuss the Huaorani informants' perceptions of the adequacy of land.

People in the two Huaorani communities in the study grow two main crops, manioc and plantains. Data from the 70 agricultural plots belonging to 14 households show that 63% of all plots have manioc and 75%, plantains. Other important cultigens include *barbasco* (for fishing), bananas (*guineo*), peach palm, papaya, sugarcane, sweet potato (*camote*), pineapple, peanuts, potato (*papa china*), and guava. Secondary crops include citrus trees, grapes (*uva*), avocado, *achiote*, *naranjilla*, corn, and cacao. Only about 30% of the *chacras* have fewer than three different cultivars (these often include plantain, *barbasco*, cane, manioc, and peanuts); the rest could be considered ploycropped gardens. Thus, in contrast to the other indigenous populations' agricultural practices, it is not unusual for a Huaorani *chacra* to have 10 different crops. On average, the number of gardens held by a household is 4.8, but this should be treated as a rough estimate because it is unclear how people delineate each *chacra* (for instance, in Quehueiri-ono, five households reported having one plot, but people may not have wanted to discuss each plot separately, or may have misunderstood the question). The maximum number of plots held by a household is 13.

The usual agricultural calendar is as follows: first the women, armed with machetes, clear the weeds and undergrowth for a new *chacra* or garden, which averages around one hectare. This may take two or three days. Informants mentioned that plots with thick undergrowth are burned, a task that takes women about a day. Then they get manioc cuttings from a garden in production and leave them at the new plot. They spend one or two days planting the new site, using a digging stick to make holes where

they put the manioc cuttings. Then men with axes cut down the trees, a task that can take a week. Some trees are left standing for shade and also if they are considered useful. (It should be noted that these are not full days of work—the Huaorani arrive in the gardens in the early morning and work until mid-day, when the heat of the sun encourages them to go home to rest.) Every three or four months women return to the garden to weed it with machetes (taking one or two days), and finally the women also do the harvesting. The Huaorani use a staggered pattern of *chacra* maintenance, in which they have multiple gardens at various stages/ages, and start new ones while others are still producing. Once the first batch of manioc has been harvested from a garden, it is time to clear a new one, so it provides food by the time the former plot is being left to fallow.

Huaorani informants stated that after the first manioc harvest, a *chacra* is left to fallow, and that after a median of 4 years, when *los huarumo*s and *las balsas* (types of trees) are large, and the fertility of the soil has been restored with many fallen leaves, one can return to the same site. They said that gardens should be used for only one harvest or else the production is not good and the land dries up. (Informants noted that fallow periods used to be longer—closer to 10-15 years—before the advent of formal schooling and sedentarization, as people used to migrate periodically. "Now it is not possible, people have to stay in the same place.") Nowadays the median period of active cultivation is 3 years, but duration of use varies with soil quality and crop composition. In any case, the Huaorani do not clearly delineate between active use and fallow; to them, a plot remains "used" as long as it continues to give any useful products. When asked how many remaining years a particular plot has to be used, a few people reply "all of my life," and when asked when they are going to leave it (*dejar*) to fallow, some said that they do not understand the question and others said that they are never going to *dejar* it.

Given the expressed uses for garden plots stated as being in fallow, they hardly can be conceived of as abandoned: the Huaorani said that they continue to harvest plantains, peach palm, guava, *barbasco*, naranjilla, cacao, citrus fruits, grapes, avocado, and achiote, among other things, as well as collect grubs, and hunt game. Garden hunting is a common activity as there are many animal pests that are attracted to the *chacras*, including paca, agouti, acouchy, deer, peccary, rats, rabbits, and birds. (Insects and strong winds, even a jealous shaman, are also cited as risks for gardens.) Only a handful of the 70 plots do not have any expressed post-cultivation use, according to their owners; all of these are monocropped. Normally only the owners of the fallowed plots or gardens, that is, those who cleared and planted them, can collect the aforementioned products from them after they are fallow. Sometimes permission is given to non-owners if, for example, they are facing a lack of food.

In terms of site and soil selection, people said that they select a "clean" (*limpio*) site that is flat, and where there are not too many trees that need to be cleared. Another criterion is that gardens should be close to the community so that in case of snakebite, one can get help quickly; plus if they are too far

away there may be a risk of encountering jaguars. One person said that gardens should be near rivers for ease of transport via canoe. Black, well-drained soils are the most desirable, and medium yellow, soft, and sandy soils are considered acceptable as well. Reddish, white, muddy, swampy, floodable, or rocky soils, and soils "with lots of wood" are considered poor. Manioc perceived as needing good soils (it rots when soils are waterlogged), and some said that plantains need it as well, but others reported that plantains can be planted anywhere.

In addition, we wanted to ascertain if the size of *chacras* has changed in recent times; of 14 respondents, five said that their gardens today are equivalent to those of the past (as is the custom, they do not plant more than is needed); three said that they are bigger (to "give to family"); and four, that they are smaller (the family has gotten smaller, and because "large gardens rot"). Two informants noted that they have a mix of sizes. It appears that household size and custom are the main determinants of garden size, and that the Huaorani as a whole are not moving toward a systematic shift towards either larger or smaller plots: as one person put it, you "work according to needs." This indicates that these Huaorani are not increasing the amount of land cleared for agriculture in an effort to earn more money cash cropping (as most do not engage in this economic activity anyway).

Besides changes in garden size, residents were asked about whether there have been any significant changes in crops grown in recent years. Overwhelmingly, crop selection has remained the same. People said that they have "no desire to plant other things," "would continue with the same crops," and "wouldn't change because we are not lacking." Nevertheless, many respondents noted that there are changes in the relative abundance of various crops, e.g., having more peanuts and tubers (such as manioc and sweet potato) in the past compared with the present. Many also said they would like to grow more of some crops, such as peach palm, guava, papaya, and pineapple. Two households said that they would like to plant cash crops such as citrus trees, naranjilla, corn, coffee, and cacao to sell. Given the predominance of traditional crops and the overwhelming focus on agriculture for subsistence, it is not surprising that none of the residents interviewed use any external inputs such as fertilizers or pesticides in their agriculture. With relatively abundant land, limited income, and distant markets, there is no reason why they would.

How is labor allocated in agriculture in these Huaorani communities? As described in the generalized calendar, most of the work—planting, weeding, harvesting—is done by women. The male role in agriculture centers around clearing land. Comments made during interviews suggest that in the past, men played a more active role in agriculture, e.g., "now the men don't help as much in the weeding of plantain." Agricultural tasks are done primarily by members of the household, with occasionally some assistance from in-laws. In Huentaro, none of the households reported using *prestamanos*, but 70% of the households in Quehueiri-ono did practice reciprocal household labor exchange for weeding and clearing.

Also, in Quehueiri-ono, two households reported using *mingas* in May and December of 2000, for clearing and planting. As *mingas* are an introduced practice to Huaorani culture, it is not a source of labor on which people rely, but something that people associate with a community activity such as for the school. None of the residents ever hire outside laborers for agricultural tasks. With such a reliance on family sources of labor for agriculture, households get important contributions from children in the *chacras*. Even when they are very small, children are expected to care for infants and babies to allow the mother to work more efficiently. Girls of age 4 to 5 begin to learn to plant, cultivate, and weed. Boys learn from age 9 to cut trees and plant. Still, some adults now complain that these days, children do not learn to work in the garden until age 10 through 12, which may be a reflection of schooling keeping them from learning important skills of *chacra* maintenance.

Part of the agricultural interview asked about domestic animals. Almost all households surveyed have domestic animals, chickens and ducks (one woman also lists her pet parrot, monkey, and a *trompetero* bird). At the time of the study, none of the households had any larger domestic animal, although a few families had owned pigs at one time (but never cows, to our knowledge). Residents mentioned that one should not have too many chickens or ducks, because they will be stolen (by both forest carnivores such as ocelots and jaguars and/or other community members). One Quichua man said that he used to have many more domestic animals when he lived closer to the market in his Quichua community before moving to Quehueiri-ono.

One of the characteristics of the Huaorani mindset is an idea of permanent natural plenty (see Lu 2001): the forest has always provided, and will always provide. With a historically low population density, mobile settlement patterns, and a large territory maintained for generations through spearing raids, the Huaorani have little experience with extinction or destruction of the resource base. This is expressed in responses to the question about whether there will be enough arable land in the future. All respondents say yes, adding "the Huaorani have much territory," "there is space for all," "the children are not going to lack land," and "the forest is not going to disappear." The next generation can go wherever they choose in Huaorani territory, and moreover, near the study communities there is a "reserve" by the Bataboro River, an area "of much land where no one lives." People believe that it is possible that in the future, gardens may be farther away from the village, but that will be the only difference from now.

Does the next generation differ from the last in terms of agricultural practices or perceptions? People remarked that the youth now are less dedicated to agriculture. Before, all young people worked hard in agriculture, now few do. Various explanations are given for this: because of school, they have less time to work; youth want to visit outside the community or play sports instead; they are weak and lazy. One person said: "Kids today as they are studying, want to live like in the city. When they make a few handicrafts, they get tired, they don't work gardens. Only the oldest have gardens and work them, the

youth that are in secondary school don't have gardens and go steal in the gardens of others, and this causes problems." Another person noted, "Before, youth worked more helping parents; today they don't learn to work and when they marry it's hard for them to work their gardens because they don't have the custom." Some mention that the style of agriculture practiced by the younger generation differs because it incorporates more types of crops: "Before we only planted manioc and plantains. Now youth want to diversify with papaya, sugarcane;" "youth want to grow more fruit." So what do people think will happen in the future? Will people spend less time in the gardens and will they move away? Few people in these two communities chose to respond to this question. Some said that people will continue to live like they do today, while others mentioned that life ways are changing, and that the youth want the customs of the city. One Quichua man said that there will be a different form of living, that people will depend more on wage work, and will have houses outside the community.

Huaorani Resource Use and Conservation

This section summarizes findings about Huaorani use and management of the forest and rivers. First, it describes hunting patterns, game taboos, fishing, gathering, and use of timber. Then Huaorani perceptions of resource scarcity and ideas about conservation are discussed.

Among these Huaorani, boys begin to hunt around the age of five or six. When asked about hunting tools, people mentioned firearms but also traditional implements with the same frequency. Adult Huaorani respondents learned to hunt with the blowgun and the spear, and only later in life did they adopt the shotgun. For instance, one man received his first blowgun at age 5 from his grandfather, made his first spear at age 10 with help from his father, and bought his first shotgun at age 20. When asked whether they know how to make the traditional hunting tools, all but one of the men said yes (the one exception lost his father when he was young). Although some men reported making less than five blowguns and spears in their entire lives, others said that they have made about 50 blowguns and 100 spears thus far. Spears are said to last about two years, blowguns, about five. The Huaorani stalk their prey, and do not use traps like some of the Quichua (of all the households interviewed in the two Huaorani communities, the only one using traps is the Quichua couple who live in the community because their daughter married a Huaorani). Hunters normally hunt alone, as "with others they talk, laugh, and don't pay much attention to the hunt." Wives will occasionally accompany a hunter to assist with carrying game, tracking, and carrying *chicha* to drink. One said that when a monkey is shot dead in the canopy, the man goes up to get it and the wife tracks the rest of the troop. Sons more often than daughters accompany the men on hunts, although girls do go as well. During times of fiestas, group hunts take place, in which someone organizes an expedition and the resulting kill is divided up among participants. Group hunts also occur when the intended prey travel in groups, and allow for the killing of

more than one animal. This strategy is used most commonly with the White-lipped peccary (*Tayassu pecari*).

Both diurnal and nocturnal hunting are practiced, and dogs are used to hunt, although informants reported that their grandfathers and even fathers did not have dogs. Dogs are useful for hunting peccary, paca, agouti, ocelot, and tortoise—thus almost everything except monkeys and some birds. Many mentioned that to teach their dogs to be good hunters, biting ants are put on the dog's body "so it will continue to track." The best hunters in the community are those who "always come back with something," and "know where to shoot an animal so it dies and know where animals go." One respondent spoke of dietary practices that contribute to a good hunter: "A good hunter doesn't eat the head of an animal, only the body. Children don't eat the eyes of an animal until age 20, or else animals will flee them. If you eat soup, then the dart will fail, unless you are older (age 20 or more), then you can drink soup."

We ascertained hunting patterns in these two communities. Of 11 responses, we calculated a decline in hunting frequency, from a median of three times a week in the past to twice weekly now. In these villages, no one currently hunts daily whereas three families did so in the past. Reasons given for hunting less include: fewer mouths to feed now; fewer animals; more school responsibilities; greater focus on selling wood; desire to conserve game, and lack of ammunition. This last reason is indicative of the current predominant use of firearms for hunting**,** representing a dramatic change in these Huaorani communities within the last generation. In Yost and Kelley's (1983) study of Huaorani hunting about 20 years ago, 36% of the animal biomass was obtained with the blowgun and 51% with the shotgun (the remainder being procured with a spear). A more recent study (Lu 1999) found that the vast majority of game (65% of the biomass) was procured with the shotgun, 29% with a spear, and only 0.22% (less than 1%) with the blowgun. In other words, the blowgun harvested about as much animal biomass as did dogs capturing game in their mouths or hunters using their hands to procure animals (as in the case of picking up a tortoise). As the Huaorani put it, "Today all animals are killed with a gun. Everything is easier to hunt with a gun, rapidly and effectively." With the current reliance on shotguns for hunting, there is a loss of technological autonomy; in other words, the Huaorani are now totally dependent on the market for their tools and ammunition whereas before they were self-sufficient, able to manufacture weapons with resources from the forest. Hence, now it is possible for a hunter to disappoint his family with decreased game consumption simply due to a lack of ammunition. Shotguns can also fail due to the humidity of the environment. When asked what they would do if their gun broke, men responded that they would hunt with traditional weapons ("they never fail") or would make handicrafts to sell to buy another gun. It would also be possible to borrow someone else's gun, in exchange for meat.

Although hunting frequency has declined, the duration of hunts has increased: 80% of respondents said that they hunt longer now than before while the rest hunt the same number of hours. The median duration of the hunt in the past was 3.5 hours; now it is 8 hours. Similarly, most hunters (80%) report traveling a longer distance to hunt, from a median of 2.5km before to 5.5km now. One man attributes this to a great deal of hunting pressure and to logging noise driving game away. Because game animals are farther from the community, people engage in multiple day hunts in which they have to spend at least overnight in the forest. Some households do this once or twice a year, while others do it once or twice a month.

The returns to hunting vary; on average, men reported 4 to 5 hunts out of every 10 are "bad" or unsuccessful. (This finding should be interpreted with caution—for groups less focused on hunting, only coming back empty-handed is a "bad" or "unsuccessful" hunt, whereas for the Huaorani, who pride themselves on their hunting prowess, coming back with only a few animals, or small game, can be accorded this same judgment.) When asked about their worst day hunting, one said it was hunting in the rain and coming back "sad" and empty-handed; another reported following a peccary all day long from the morning to the end of the afternoon and not getting anything more than spines in the feet; and another said it was not killing any animals but almost getting killed by a snakebite. One man said that he was so upset about coming home empty-handed that he "did not even want to drink *chicha*." The best days of hunting involve killing five peccaries, or five monkeys and a deer, or two tapir. Sometimes it is simply the rate of return—killing a deer in half an hour or immediately encountering a guanta. Although none of the Huaorani noted this as an important factor, the Quichua couple stated that their best days hunting are on Fridays and the worst are Tuesdays.

Huentaro accounts for 59 of the 84 recorded Huaorani hunting excursions, and 239 of the 405 animal encounters. Of these, 127 (53%) animals were captured (and killed), 93 (39%) were not, and for the remaining 19 encounters, that information was not given. In 49% of the cases, a firearm was the weapon of choice, either alone or in conjunction with a dog or machete. Quehueiri-ono accounts for 25 of the 84 excursions, and 166 of the 405 animal encounters. Of these, 51 (31%) were captured, 63 (38%) were not, and information was not available for another 52 encounters. Of 76 encounters with information about equipment used for hunting, in 62 (82%) cases a firearm was involved.

In these two Huaorani communities, of 334 game encounters for which we have capture data, in 178 of these cases the animal was caught, giving a kill versus encounter ratio of 0.53. The most frequently caught prey in Huentaro and Quehueiri-ono were (in descending order): Cracid birds (Family Cracidae, the large land birds which includes guans, currasows, and trumpeters, n=31 or 17.4%); Woolly monkey (*Lagothrix lagothricha*, n=24 or 13.5%); Collared peccary (*Tayassu tajacu*, n=16 or 9.0%); agouti (*Dasyprocta* sp., n=14 or 7.9%); deer (*Mazama* sp., n=8 or 4.5%); paca (*Agouti paca*, n=7 or

3.9%); and toucans (*Ramphastos* sp., n=6 or 3.4%). Monkeys as a whole constituted 52 (29.2%) of the animals captured, and 52 birds were caught as well. It is important to note that Cracid birds and Woolly monkeys, large-bodied representatives of their taxa and desirable game species, are vulnerable to overexploitation due to low reproductive rates. They are often some of the first species to be hunted out of an area.

In terms of women hunting, informants said that this was more common in the past. More than half of the women interviewed reported having killed an animal, most commonly with a machete around the garden, with the assistance of a dog. Favorite prey include pacas, agoutis, and acouchies. One of the women in Huentaro reported killing larger animals, such as peccaries, with a spear, when her husband was away working in wage labor for the oil company. Most women mentioned that their hunting is opportunistic, e.g., when they encounter something en route to their *chacras* or in the *chacra*.

Huaorani residents were asked about game taboos. These include anteaters, turtles, and caiman. Before, only the White-lipped peccary was taken, not the Collared peccary. Two lines of reasoning for tabooing the Collared peccary were given: (1) "because we didn't have dogs" (White-lipped peccary travel in large groups and can be hunted efficiently by groups of men); and (2) "if you eat it, you get a headache." Tapir, coto monkey, and capybara were not taken before either. Some of these animals are associated with bad spirits, none more so than deer. "Deer are the devil," they said. Other animals mentioned to be inedible are snakes, certain raptors, scavenger birds, bats, and jaguars. The jaguar is associated with humans, as the Huaorani believe the shaman can transform into a jaguar. People vary in their responses about whether anteaters and frogs are edible. They mentioned that the Quichua have taught them to eat snails and grubs. In the two study communities, many of these taboos have been relaxed, and people kill and eat Collared peccaries, deer, capybara, and tapir. Animals such as jaguars, anteaters, raptors and snakes are rarely eaten, however.

Unlike hunting, which is largely the domain of adult males, everyone now fishes, beginning at age five or six. Whereas before contact, the Huaorani did not rely on food from waterways as they lived in the uplands away from the rivers and streams, now they usually live along rivers and have been adapting more and more to riverine life. Before, they occasionally used fishing methods including hook and line, *barbasco*, harpoons, and nets, but now there are other techniques to choose from, including dynamite, weighted nets and masks or visors. Unlike hunting, fishing is less prone to unsuccessful days in which people return empty-handed. Respondents said that only two or three out of ten fishing trips are unsuccessful. About half of the informants now prefer to fish rather than hunt because it is less likely to fail, is easier, and is closer to the community, obviating long hikes in the forest. They also feel that fish has a good flavor and provides variety. Nevertheless, the other half said that hunting is better, meat is

better to eat, and it is good to have meat to share, because the animals are larger, and this is the custom. Fish also "have too many bones."

In terms of fishing patterns, people fish less in the late fall and early winter when the river is high. The drier months witness an increase in the frequency of fishing. The median frequency of fishing is twice a week now, up from once a week in the past. The duration of fishing trips has not changed, however, at a median time of 3 hours. Families reported eating fish anywhere from almost every day to once or twice a month, with two or three times per week the most common.

The Huaorani sampled for this project were asked about plants they gather from the forest. A detailed study of their ethnobotany and ethnomedicine is found in Davis and Yost (1983a, 1983b). When asked about the most important non-timber forest products they use, the Huaorani mentioned food items such as *ungurahua* seeds, *cacao de monte*, peach palm, forest grape (*uva de arbol*), *inga* species, *avio de monte*, and *cacao islanco*. Construction materials include peach palm, *paja toquilla*, *pambil*, *inayo*, and *muro muro*. Medicinal plants include *ajo de monte*, *uña de gato*, *ayahuasca*, and *guimane*. *Chambira* palm, *pambil*, *inayo*, *guimane*, peach palm, *hueitiña*, *pantano*, and *tapemo* are used for handicrafts. None of these items is directly commercialized by these communities, and all are harvested with a machete or an ax individually or in groups, depending on resource abundance. If a tree is large then it is cut down; if it is small or medium size, people climb up and cut branches. There are no rules or prohibitions about harvesting any of these items, and these resources are perceived to be in the same abundance as before.

For the Huaorani, the input/output diary recorded 131 non-edible products collected from the forest. Of this number, 98.5% were plants and only 1% was used for sale. Thus, most non-edible forest products are collected for domestic uses: 47.6% for handicrafts, 26.7% for construction, 17.1% for firewood, 1% for agriculture, and 1% for other uses.

In terms of timber, the Huaorani use wood for housing and canoe construction, firewood, and manufacture of simple furniture. More sale of timber occurs in Quehueiri-ono, where people said that species such as cedar, *manzano*, *sangre de gallina*, *chuncho*, and *canelo* are becoming scarce. Cedar is especially hard to find—25 years ago there were trees close to the community, but now people have to walk three to four hours to find it. As a result, residents planted 30 cedar trees three years ago for canoe manufacture. In Huentaro, some reported that trees such as laurel, *sangre de drago*, *chuncho*, and cedar are as available today as in the past (although another resident said that cedar and *canela* are harder to find). The president of Huentaro emphatically said that he is not in support of their community selling wood. He said, "We have to take care of wood for our sons, it is for the children, we can't sell it. If we begin to sell one tree, then everything is gone." He said that outsiders have approached him to try to buy tropical hardwoods, but he asks such a high price that they leave. Residents in Huentaro also do not plant trees. At the time of the study, in both communities, only one chainsaw was encountered (in Huentaro); it

reportedly was stolen from loggers who illegally took wood from the Huaorani territory eight years ago. When wood needs to be cut to make houses or furniture, the Huaorani contract Quichua and pay in currency, wood, or smoked meat. One Huao man reportedly borrowed a chainsaw from loggers at $6 per day.

For all these natural resources—game, fish, non-timber forest products and wood—we inquired about perceptions of scarcity. In regards to animals, informants said that their favorite animals to eat include *perdis*, paca, powhil, pava, peccary, and deer. Most said that they ate more of these animals when they were young, but a few replied that they eat more now, either because they used to live in an area where these animals were not abundant, or because there was a belief that eating birds like *perdis*, *powhil* and *pava* when young would make a youth a bad hunter or unable to fell large trees. One person who likes to eat peccary and deer said that he eats more now because, unlike his father and grandfather, he has dogs to help him hunt. Animals particularly hard to encounter now include tapir, large parrots, monkeys, White-lipped peccary, deer, paca, and armadillos. One man said, "Within the last 25 years the village population has grown…In 20 years …peccaries and monkeys are going to become hunted out a bit. Pacas and agouti are going to tolerate this pressure more. Pava, powhil are going to disappear more quickly." The growing scarcity is attributed to two main causes: the road and the noise of gunshots and chainsaws. The "noise of guns and people drives animals away." However, the residents see that there is more game in their communities than in other places, and that there are places within Huaorani territory (like Cononaco) that have even more plentiful game. In the case of fish, only two people said that there are not many fish in the river now, which they attribute to the use of dynamite and *barbasco*, the sound of outboard motors, and the smell of the road. All others stated that there are many fish, plenty for the two communities. Nothing special is done to sustain fish populations; one person said, "We don't do anything to take care of fish because we are never going to run out." Fish resources are "free for all," implicitly meaning all residents of the community. Although people emphasized the abundance of fish resources, they still noted temporal changes, with everyone stating that the fish populations are not as plentiful as in previous years (even the year before the ethnographic study, but especially compared to ten or more years ago). Finally, none of the non-timber forest products are identified as becoming depleted, in contrast to trees such as cedar.

Before talking with people about their ideas and practices regarding conservation, we asked what their definition of a "healthy forest" is. Only six people responded, identifying aspects such as a forest with many animals, fish, fruits, and natural medicine, free of noise, disease, and plastic trash. It is forest that has not been cleared, because that is "ugly, and many leaves fall." The advantages of a healthy forest are plenty of animals, and trees that never end, where one can build a house, have fresh air and water, and attract tourists. When asked to give their definition of conservation, most people did not know. Those

who did reply mentioned maintaining the forest to use its flora and fauna for food, to have a reserve for game and gardens, to preserve the culture and to protect Huaorani territory: "To care for the trees so they live;" "to have plenty to eat from the garden and the land, taking care that other people do not come to steal;" "to maintain the forest for children and grandchildren, as a reserve for the future and to live in the present."

We asked people what, if anything, do they do to conserve. In other words, are there any rules for using resources, or prescriptions against any uses? People shared their perception of the role of humans in the forest, which they see as intimately tied to using resources: "to serve yourself of the animals, fish and resources to live, this is the role of humans…animals serve to eat and sell, rivers to bathe, drink, fish, and navigate…the role of humans is to live and eat animals…in the forest, find wood, in the river, find water, and in the forest, find materials to make crafts…we have to maintain the forest so that children live the same and conserve the culture." When asked about what rules exist regarding resource use, the responses were dichotomous. Some said that there are no rules, and that people can hunt whatever they want, use the weapon of their choice, and go wherever they like. For fishing, all techniques are acceptable, including dynamite and *barbasco*, but in using the latter, people should advise others so they do not collect (poisoned) water from the river. The lack of rules pertains only to the *bona fide* residents of the communities, the Huaorani and their Quichua kin by marriage. But a second group stated that there are things that they do to conserve, such as not damaging animal trails, nor cutting trees that monkeys need to move around. Trees by riverbanks should also not be cut, and plastic or paper bags and old clothes should not be thrown in the river. Other actions include "watching over the limits of the territory so that others don't steal what is for our children and grandchildren."

Huaorani Perceptions of Outsiders and Aspirations for the Future

The Huaorani were asked about the types of outsiders with whom they come into contact, and how they feel about them. Because of the romanticized image of the Huaorani and the richness and size of their territory, they have no shortage of outsiders with whom they come into contact. Some respondents do not differentiate between the types of outsiders, saying they do not like anyone visiting their community: "they visit a lot, ask questions, and pay little;" "I don't like them coming, am not accustomed to it;" "I am tired of having to listen and talk to them." When assessing the various outsiders, a common consideration is whether, and how much, the outsiders give to the community. For instance, when asked about oil companies, comments included: "the oil men came to ask permission to make a well. They gave food and school supplies. I liked it because they gave food;" "a medical team from YPF comes every four months to give medical and dental attention—it's good because it's free;" "an oil company came in 2000 for one day to see the landing strip, but they left nothing." The medical personnel

sponsored by oil companies do not charge for their services but residents often complain when they do not give other gifts as well (such is the expectation of wealthy oil companies): "they came in February to give medical and dental help, stayed two days, but didn't give anything," said one informant. Other agencies also provide medical care, such as the Red Cross, but this service is not always free (either by necessity, principle, or both). Residents complain when medical care they are accustomed to getting without charge by oil companies is not free with other groups: "I didn't feel good because they charged, not free like the others." Tourists are often perceived favorably because they bring in money and buy crafts: "tourists came in 2000, they bought crafts, stayed three days, and paid 1,500,000 sucres ($60) to enter the community;" "they donated a ball as a prize in a volleyball tournament. I was content because I sold crafts and got money;" "it's good because they leave money;" "I like it when tourists come to buy crafts and give gifts." While tourists are content to see the community, researchers are more demanding: "they gave money to know how we live;" "they stay for months;" "they are here to write a book;" "they give money for interviews, a lawnmower too. I like it when they pay well." Other frequent visitors are the Quichua "godfathers" (*compadres*) who come to help occasionally in *mingas*, attend parties, and go hunting in the relatively faunal-rich Huaorani territory. The Huaorani have acquired a reputation for incessant demands for goods and money from outsiders; past contacts with missionaries and oil companies have led to a pattern of seeking things from all outsiders.

Some residents have very negative perceptions of oil companies. One man said, "I cannot accept damage like the oil company, with the road, illnesses, oil, chemicals, rotten air, contaminated rivers, cars that kill animals." Although people said that they currently do not have problems of contamination in their communities, they have seen what oil companies have done in places such as Santa Rosa and Gareno. With oil companies also comes prostitution, and they "take out much money and cheat the Huaorani with small gifts." Similarly, opinions about logging companies are negative: they damage the forest, the noise of the chainsaws drives away animals, they take fish and game, and "they receive all the benefits while we have no cedar trees to make canoes." Some equate loggers with drug addicts, given that many loggers come from Colombia. "If loggers come in," one says, "we need to take their chainsaw and tell them to leave. If they don't listen to us, we have to kill them."

Missionaries are said to help "take out disease." They foster respect among families, educate them, and teach people not to drink alcohol. On the other hand, they try to change the culture, and impose their rules. They create fear in people with their religious message about what happens if one does not believe in the Bible. In contrast, researchers teach residents to value what they have and encourage them to maintain it, to protect nature, and also provide some income-earning opportunities. However, they are criticized for often not sharing the results of their research with the community and for inaccuracies in their reports. They should explain more fully their study, as people are annoyed when they do not have a

clear idea of the study's purpose. Finally, tourists are the most liked of outsiders, as they are a source of income, do not contaminate, and support the community with gifts. However, they can also bring in new diseases.

Residents were asked if they thought people outside the community are different from them, and how. One person said that outsiders are the same, but most note differences. Some are obvious, such as having a different language, race, nationality and customs. Many others point out differences in dress: "they have lots of clothes and we have few clothes." Physical differences are noted: "there are blacks and they are bad," "there are fat whites, small ones, and thin ones." Other comments include: "outsiders talk about other things, spend time in offices;" "some whites are good and generous, giving bread, food, and cola." (One Quichua respondent interpreted the question as eliciting her sentiments about the Huaorani. "The Huaorani don't really understand things," she believes. "They are not like the Quichua who know how to be leaders of their communities.") The Huaorani generally equate "good" outsiders as ones who provide assistance. When asked about the kinds of support they need for the communities, most Huaorani mentioned medicine, education (a secondary school), seeds, solar panels, cement for the school, communal pots and pans, wage labor opportunities, and money to buy food and clothes.

People in the Huaorani communities were asked to give their definition of "development." The responses differed considerably between the two villages. In Quehueiri-ono, people associate development with education, health and tourism. Development is seen as needed to change people and make them into something else. For instance, one person emphasized that education is needed to "know what lacks in the community and to do things well and have work more easily"—in other words, the teachings of outsiders can tell residents how to improve their lives. Other ideas about development and "progress" involve an ability to manage money well, to learn about the outside life, to buy more, to cure illness, to manage the forest, to "organize yourself to advance," to teach people "how to be cleaner."

In contrast, in Huentaro, farther up river, people associate development with *huaponi onohuoca* or "the good life." A good life means dancing traditional dances, dancing with headdresses, drinking lots of *chicha*, talking, asking for marriage, being content and respectful, singing songs. It is to live without problems or bad influences, without conflicts with others (as they had with those of Quehueiri-ono earlier), and without lies or enemies. They do not want people from other communities to come and damage them with alcohol, harass women or lure single girls away. But they do not want to be isolationist either: outsiders can be involved. "When someone comes to help, we need to talk among all, [have a] meeting, share what is needed for each and care for the things that help the community," said one man. A dialogue between residents and outsiders can help identify their needs. In the words of the founder of Huentaro:

> This community is not developed. To be developed, we have to live like our grandparents, to be strong like our grandparents, have the strength to denounce when outsiders do bad things to us. People have to be strong. No one will mess around here because we are warriors, going to kill, hard we will work, never to fail, defending ourselves. Tranquilly we will live…we are going to live like our ancestors, never to leave our culture.

The Enomenga family, which comprises most of Quehueiri-ono, is informally led by a man who spends most of his time away from the community, among foreigners. In part because of his influence, those in Huentaro broke off to move upriver where they could live a more peaceful life.

Earlier, when asked why former residents left these communities, people mentioned that they wanted to be closer to the road and to markets. For the Huaorani and other indigenous groups, roads link them to the outside world both physically and symbolically. We asked people to weigh the pros and cons of roads and markets. The pros center around the ease of transport: "with roads and cars that can carry us, we don't have to walk as much and carry game, which is tiring and makes the body ache. With the market closer, you can go to buy and sell more times." With road access, one can leave quickly in an emergency, sell crafts and products, and facilitate more tourism. On the other hand, there are many drawbacks as well: roads interfere with animal movement and the noise drives animals away; roads bring in loggers and colonists who use up resources; and roads increase the possibility of contact with thieves and guerillas (FARC, from Colombia). With the road, girls, women, and spouses leave, while diseases, trash, and pollution enter. Given the tradeoffs, most of the Huaorani feel it is better to have the intact forest rather than a road, since the forest is "important for the future, for all, not just for now." But the ambivalence is also clear, as many said they would accept roads and markets "if they don't affect us."

Given that people speak of how the forest provides basic sustenance through provisioning game, food, construction materials, and medicines, we asked residents if they think it is possible to live without money. Can they envision living outside the market economy? In Huentaro, *all* the families said that it is possible to live without money, because they can still hunt and fish. However, in Quehueiri-ono, half of the respondents replied that money is needed for survival, to buy items such as clothes, gas, food, school supplies, salt, matches, and soap. Interestingly, these latter respondents are comprised of the Quichua couple and three Huaorani intermarried with Quichua (although one interethnic couple said it was possible to live without money). All the other strictly Huaorani households in Quehueiri-ono, as in Huentaro, said that the forest provides all that they need, that one "can get everything from hunting, fishing, and gardens."

Next, informants were asked about their perceptions of the city. Some residents go to the nearest major Amazon town of Coca to play billiards and drink beer or "sugar water," and to visit street vendors "who grill pigs and fish." The food is especially appealing, notably the chicken, fish, and salad. They

like the bridge in downtown Coca and the stores, and feel it is good to know new things. But Coca is also seen as dangerous, with many thieves, and people complain that the roads are hard to walk on because of the dust and mud. There are also many flies. Some have gone to Quito, which they like to visit to see the airport and the *Parque de la Carolina* (large urban park, with grass and athletic fields), and ride the trolleybus. The size and population density of Quito make a strong impression. Still, one man soon wanted to return to the forest, since "it is cold [in Quito], you have to spend a lot of money, and you have to be careful of the cars." We asked people if they would like to live in a city if they had enough money. Of 13 respondents, only 4 said yes. The others prefer the forest, where life is easier and more tranquil, where there is meat and *chicha*, where things are more pure and they are "taught everything natural." "If I went to the city," said one, "I would die. I don't like city food, and the [non-Huaorani] would kill and eat me."

Our assessment of people's aspirations is intergenerational—both their desires for themselves and then for their children. People were asked about their consumption aspirations, what they would like to eat more of, or less of. The (mostly female) respondents said that they want to eat more fish, vegetables, rice, bread, and noodles; two people (Quichua) replied that they want to eat less monkey meat, and two others feel that eating deer is bad and causes vomiting. The most sought-after items for the home include radios, sewing machines, stoves, televisions, pots and pans, furniture, machetes and ammunition. And everyone wants more things for personal consumption and their children—clothes, shoes, medicine and school supplies.

Looking to the future, adults were asked what their educational and occupation aspirations are for their children. All parents said that they want their children to finish primary school, to graduate from sixth grade, and many mentioned that they would even like them to complete *colegio*, or secondary school. Notable in the responses are qualifications for daughters: "she can go to secondary school if we have the money," or "if my daughter only finishes primary school, she will stay at home with me, to cook." Education is seen as important for their children to speak and write Spanish, to count money, to be able to find employment, or simply because they need to "learn for themselves."

In terms of work, Huaorani boys usually begin to earn money at age 15 to 19. People said that they want their sons to do oil work, or be teachers, drivers, carpenters, or tour guides; many want them to finish school first, so they can get better jobs. But one person is opposed to her son engaging in wage labor: "he would have to leave, and can die, and is the only son—it is better that he stays and makes handicrafts instead." Girls typically begin to work at age 13 to 18, making handicrafts, working as a health promoter in the community, or leaving to be domestic employees. Respondents do not want their daughters leaving the community; they should stay home, do domestic work, and make handicrafts. In a few cases, parents consented to the idea of their daughters' leaving to be educated so that they could

return as teachers or health promoters. One mentioned that her daughter could finish secondary school and then write about the life of her grandmother, in the Huaorani language.

Given their continued reliance on the forest, and their recent history of contact with outsiders, it is not surprising that parents overwhelmingly want their children to remain in the community. They said, "Here you live well, there is everything;" "the land is good;" "here is food, you don't need to buy." There is no money to live in the city, they pointed out, and if sons leave the community, they may be "eaten" by the colonists and die. People want their sons to stay to care for their parents, to keep their grandchildren close, to help hunt, fish, and to continue to work the land. A couple of parents are more open to their children leaving the community, for instance, to move to Coca, or to go away to study, even in another country if possible. Most want their daughters to stay in the community, so they can help the family and because life in the city is too expensive; some of the reasons given, however, are slightly different from those given for sons. For instance, respondents said that "outside she would learn bad things," "so that they don't walk the streets, [daughters] should stay in the house," and "where else would she go?"

If their children stay in the Amazon region, what will their standard of living be like in the future? Specifically, we asked: what kind of environment will the next generation have? Responses here are unilaterally optimistic: the youth will have the same natural resources that people enjoy now. This is because Huaorani territory is so extensive, and because people take care of the trees and waterways. The youth have to be taught to defend the territory, to not let in loggers and oil companies, to care for the land. However, opinions about the *type of life* the next generation will have are mixed. Some believe that the youth will leave and change through formal education, will stop speaking Huaorani, and will live on tourism and oil work. "The life of youth will be like outsiders in 25 to 30 years," said one informant. Currently, Huaorani youth leave the community for wage work, for money, to look for partners, and to live in the city. Some leave to study at the secondary schools in Quihuaro or Daimontaro, while others go to the Huaorani federation office in Puyo and do nothing. Other informants believe that the current way of life, with ties to the past, will continue. As the founder of Huentaro stated, "Yes we are going to live the same way, our culture is not going to change, we are not going to be like *gringoes*, never going to forget the Huaorani language. Just as they learn in school, kids need to learn to make gardens, do everything their parents do. If not, they need a talking to. How will they live later?"

THE COFÁN

[Graduate student Gabriela Valdivia meeting with Cofán leaders. Photo: Flora Holt]

The A'i people or Cofán traditionally comprised part of a large group of more than 15,000 people who occupied the area between southern Colombia and northern Ecuador. There is not consensus on their ethnic origin; some authors have argued that the A'i language is unique, whereas others believe they belong to the linguistic Chibcha family of Colombia (Califano & Gonzalo 1995; Cerón 1995). At the end of the 19th century, during the exploitation of quinine and rubber, the Cofán people were exploited by rubber tappers, many working as slaves with high rates of illness and mortality. Less than a century later, the Cofán were displaced by the exploitation of petroleum, which led them to move from the region around Lago Agrio (where oil was first discovered in the Ecuadorian Amazon in 1967) to scattered settlements deeper in the forest. At this time the Texaco–Gulf consortium started the exploitation of petroleum, and installed the first Amazon refinery in Lago Agrio refining about 1000 barrels/day of crude. As a consequence of petroleum exploitation, the forest was devastated, forest food resources

diminished, water and rivers contaminated by oil spills, and air polluted by the practice of burning off excess gas (Kimerling 1993). This led the Cofán to migrate away, mostly downriver from Lago.

Currently, the Cofán of Ecuador number approximately 500 people, and live in five communities of Chandia Naen, Sinangüé, Duvuno, Dureno and Zábalo. Our ethnographic study community, Zábalo, was founded in 1979, and in 1995 was recognized as a legal "center," with 28 families. Earlier, in 1992, through an agreement with the Ministry of Agriculture and Cattle, the Cofán of Zábalo were given legal title to a territory encompassing 80,000 hectares. Years later, in 2001, through an agreement with the Ministry of Environment, this area was increased by 50,000 hectares in the area of the Guepi River, which is entirely inside the *Reserva de Producción Faunistica Cuyabeno* (Albuja *et al.* 2001).

The discussion below is based on data from 27 Cofán households comprising the entire population of 133 people in Zábalo as of 2001. However, some sections are based on fewer than 27 households since not everyone collaborated in this research, including several who were quite isolated from the main community and therefore inaccessible for studies such as input-output diaries. We also exclude the family of the Caucasian "chief" of the Cofán, Randall Borman, the son of U.S. missionaries, who was raised among the Cofán and integrated himself in their society. Borman's family is included in the section on demographics but not the other sections because they no longer reside permanently in Zábalo, spending more time in their Quito residence. Nevertheless, Borman is an important political representative of Zábalo and indeed of the entire Cofán Federation.

Cofán Demographics

Of the 133 inhabitants in 27 households of Zábalo, 55.6% are men, and 44.4% are women (the numbers are respectively 74 and 59, yielding a high sex ratio of 1.25). This is a young population, with 48.9% of the population under the age of 15 years old. Due to the high mobility of this population, only 31.6% of the residents were born in Zábalo, the adults mostly coming from other Cofán villages. Some persons are Siona and Quichua Indians who arrived from other communities. In terms of languages spoken by adults (defined as age 12 or older), 17 (22%) of Zábalo residents are monolingual in the Cofán native language (A'ingae), while 56 of 77 (73%) adults speak Spanish in addition to A'ingae. Eight people speak another indigenous language in addition to A'ingae and Spanish (Siona, Shuar or Quichua), and three speak English (Randall Borman, his son, and another young man from a separate family who is studying in the United States). Besides adults, there are twelve children (under age 12) who are bilingual (A'ingae - Spanish), and one who speaks A'ingae and English.

Women get married for the first time at a mean age of 16.4, with the earliest marriage at age 12 and the latest at age 22. Two-thirds of the women live in *union libre*. Of the 15 adult women sampled, over a quarter (n=4) are married, and there is one case of a separated woman living alone. Three women

have been married twice. Almost three-quarters of the women (n=11) were married for the first time in unions arranged by their parents or other relatives. Of the three women married twice, two remarried out of their own decision with their husband rather than having it arranged. There are no polygamous marriages. Although one couple got married in an evangelical church ceremony, generally wedding ceremonies are informal. In most cases, the man's family arranges a celebration. The people hunt and fish first, then a party is held for an entire day with food and drink, giving ample time for relatives to share their advice about marriage. The older generations had similar celebrations, but with the music from traditional instruments rather than the current radio or Western sound system.

Fertility of the female respondents is high. While their grandmothers had an average of 5.1 children (with 3 to 5 being most common), their mothers had *higher* fertility, with an average of 7.1 births, with 6 to 8 births being the mode. The 15 women informants themselves had an average of 3.4 live births at the time of the survey, but most had not yet completed their childbearing. Sampled women reported having had a total of 118 live births, of which 11 (9.3%) did not survive. With respect to their views of mortality, some informants said that their grandparents died as a consequence of *cucuyu*, which is a bad spirit that causes sickness. Other causes of death named include colds, coughs, stomachaches, diarrhea, tuberculosis and swelling of the body. Two people died as the result of homicide and one died of old age.

In terms of nursing practices, most mothers breastfeed their babies. Almost everyone thinks breast milk is better than purchased food until children are 15 to 19 months old, with a few preferring to breastfeed until 2 to 3 years of age. However, two women said that they would prefer to feed their infants store-bought foods. Besides breast milk, women feed their children *chucula*, meat, and soup starting at age five months to a year. Many children suffer from diarrhea, which women ascribe to parasites transmitted through contaminated water (but one mother thought diarrhea results from too much breast milk). Two-thirds of the mothers (n=10) use local plants as medicines, two buy purgatives and anti-parasite tablets, and others use both traditional and Western medicine.

We ascertained women's opinions about contraceptives; 60% (n=9) of the women are in favor of using methods to have more control over their reproduction. However, no one has used any form of modern contraceptive, or even knows how to use these methods. One woman said that she learned the rhythm method from a nurse in Lago Agrio, and another used *cananguchu*, a plant given to her by her grandfather. Although some women are concerned about possible harmful side effects, most would like to use some form of birth control.

In terms of formal education, 53 males and 47 females past schooling age were surveyed to ascertained highest education received. Seven (13%) males and 7 (15%) females had no schooling. For primary education, 35 (66%) males and 39 (83%) females did not graduate from sixth grade, whereas 4

(8%) males and 1 (2%) female did. The gender disparity in education is seen in the number going on to secondary school: whereas no females even attempted secondary school, 6 (11%) males started but did not finish. No one has finished secondary school or pursued a more advanced education except Randall Borman. In Zábalo, most children attend school five hours per day, five days per week. Absenteeism is infrequent; when students miss classes, it is usually due to illness or because the teacher is absent. Most parents want their sons to finish high school and even the university, but only aspire to having their daughters finish high school. Education is considered very important as literacy and fluency in Spanish are seen as the means to good employment.

In terms of religious affiliation, over half of the informants (8 of 15) identify themselves as Catholic, the remaining being Evangelical. Currently, everyone worships actively, attending services on Sundays in the communal house, as there is not, and never has been, a church *per se* in the community. Generally the service is in A'ingae, and involves reading the Bible and discussing themes. Sometimes missionaries visit; they are perceived as good people who teach them how to live closer to God and how to avoid problems such as alcoholism and theft.

Lastly, demographic interviews ascertained migration patterns. Although there are a few people from other ethnic groups who have migrated into Zábalo, most residents are close kin. This is seen in the prevalence of certain last names—e.g., Criollo, Mendua, and Lucitante. There is a Siona family, Yiyuguaje, which is not related to anyone in the village but still has close ties with residents. Overall, 32% (42 of 133) of residents were born in the community, and most of these are children. Of those not born in the community, common previous residences (n=17) include Dureno (59%), Sinangüé (18%), and Colombia (12%). In most cases, the ones who decided to move to Zábalo were husbands (stated by 53% or 8 of the 15 women respondents) or parents (27% of the respondents). This suggests that the dominant decision-making power rests in the domain of males in this population.

There has not been any reported migration out of Zábalo, with even the young preferring to stay. As one person emphasized, "it is good to live here." Most stay because there are enough animals to hunt and fish, plentiful food, and sources of income from tourism and craft making. Fourteen children from nine families spend most of their time outside the community in Quito (and in the case of one boy, in the US), but they are not considered out-migrants because they are studying, and every vacation period they return to their homes in the community.

60% of respondents visit other communities once per year, or 3 to 4 times per year (40%). They often visit Dureno where they have relatives, while at the same time they can buy food and clothes or receive medical care. Ties are so strong that 20% of Zábalo residents own a house in Dureno, and as mentioned earlier, most migrated from Dureno. Besides Dureno, other places to visit include Playas de Cuyabeno (an upriver Quichua community), Sinangüé and Duvuno. All are visited not only to see

relatives but also during festivities or sports competitions. Less frequently, residents travel to Lago Agrio or Quito to attend to other business.

Cofán Social Organization

In Cofán society, the basic unit of social organization is the household, followed by the community and then the federation FEINCE (*Federación Indígena Cofán del Ecuador*, the national Cofán Federation of Ecuador). The main leaders of the community are the president, vice-president, secretary, treasurer, and a board of directors, posts that they serve for one year. They are elected by a majority vote of members over the age of 15 every year in the middle of December. Their responsibilities are to coordinate, organize and resolve matters among the community, and represent the community and seek improvements with the Cofán federation and local and national government institutions. Communal matters and problems are discussed in a general meeting or assembly held when needed, and not according to an established schedule. Communal *mingas* are held every three weeks for a day or two to clean, build, or repair communal areas, such as tourist huts, the teacher's house, the school, and the soccer field. Sometimes *mingas* are called just to prepare for a community fiesta. People said that the frequency of *mingas* was higher in the past when they were building the school and the tourist huts. Every member (*socio*, encompassing community residents aged 15 or older) is required to attend the meetings as well as the communal *mingas* or else pay a fine.

Any Cofán person from another community can live in Zábalo if he/she is linked through marriage or blood. Outsiders (Cofán or non-Cofán) must live in Zábalo for one year, after which the community decides if membership will be awarded. Once such persons have community approval, they can build their house and canoe, work their own *chacra*, and have their own plot of land. Besides attending communal assemblies and *mingas*, members must obey communal rules about hunting, fishing and gathering forest products (explained below). A person who breaks these rules must pay a penalty of $24 the first time, double that the second time, and increasing by $24 each subsequent time. Except for one Shuar woman, all members of other ethnic groups in Zábalo (one Quichua family, one Siona family, and one Quichua woman) are full-fledged members. However, only men are owners of property, such as the land, house or canoe, even though women are *socios* of the community.

In Zábalo, land is held communally, strict rules of membership apply, and members have usufruct rights to land. Those who clear and plant a plot can pass it on to their offspring, but they cannot sell the plot. If they leave the community, these former residents no longer have rights to the land. Any new person who comes to the community can pick an unoccupied area to clear and work. Among those interviewed, three of 15 plan to abandon their land in the future, ten plan to leave it to their children, and two did not know or reply. Most of the total land area of Zábalo is forested and held communally. All

residents have rights to use them to collect faunal, floral and water resources. Other communal property consists of the outboard motor, canoe, school, museum, tourist huts, two wells, the turtle-raising project, and a communal dining area.

In terms of exchange and sharing patterns, there is no fixed place or time to exchange goods; sometimes people lend and borrow such as a chainsaw, canoe, or gun in exchange for game or labor. The data show that every family shares game, fish, *chicha*, *chucula* and garden foods such as manioc, *oritos* (small, sweet bananas), and plantains. Most people share with close relatives (by blood or marriage). But if a large animal is killed on a hunt, the family of the successful hunter(s) usually shares the abundance of meat with relatives, friends, neighbors, and other members of the community.

Cofán Household Economics

This section addresses the Cofán standard of living, economic activities, and infrastructure and services available in the community. In 2001 most houses in Zábalo were built using local timber for the floor and walls and palm thatch or metal sheeting for the roof. Inside the house is a space for cooking; an open place to rest, work, and receive visits; and a place to sleep. These divisions usually, but not always, involve separate rooms. There is no electricity in the community, but four of the 27 households (in the center of the community) have solar panels and one has its own generator, which provides electricity for lighting and audio systems. In the absence of plumbing or a sewage system, human wastes are eliminated outdoors. A quarter of the houses have latrines close to their houses and there are two latrines for the school, which are flushed by using a bucket of water. There are three more toilets in the tourist area about 200 meters from the community, which has a more sophisticated system of toilet seats with well water used for a flush toilet.

Water for drinking, cooking and bathing is collected from rainfall and small streams; water from the Aguarico River next to the community is used for washing clothes and often for bathing (especially during the dry season). There is a well in the tourist area, close to the communal center, which is used by tourists, researchers, and sometimes by residents. In 5 of 8 of the households, respondents reported that everyone in the family helps collect water, while in the rest the women (wives or daughters) do it. The water source is a median distance (as measured by travel time walking) of 25 minutes away, and people collect water one to three times per day during the dry season, and one or two times per week during the rainy season. For fuel, five of eight households use both propane gas and wood, but the other three just use wood. Everyone in the family collects wood, but women collect most of it. The median distance of the firewood source is 4.5 hours, and this task is undertaken with a median frequency of a little less than twice per month.

Data recorded from the input/output diary give some idea of dietary patterns. There is strong reliance on the forest and rivers for sustenance: of 448 household-days recorded over the five month study period, people from Zábalo consume protein from forest game 48% of the days and fish, 44%. People's food preferences reflect this finding: when they were asked about their favorite food, 90% of the respondents named forest game, such as monkeys, Collared and White-lipped peccary, and birds (e.g. piping guan). In lower proportions, other sources of animal protein are purchased or domestic animals and eggs (each only about 4%). Little milk or cheese (1.1%) or beans and lentils (3.6%) are consumed. Besides meat, over half their diet (55% of the days) are comprised by carbohydrates, especially manioc and sweet potatoes, as well as fruit (especially plantains and *oritos*). Legumes (16%) and nuts and seeds (2%) comprise little of the diet.

Most people eat only once per day and meanwhile drink *chucula* various times during the day. The main meal is served at the end of the day. For the most part, food is not lacking in Zábalo. However, some people reported going to bed hungry because they did not go hunting or because the woman was menstruating. (When a woman is menstruating, there is a taboo on her cooking or doing domestic tasks, as it is thought that her menstruation blood could contaminate and kill a man.) However, for the Cofán, "not eating" just means not eating meat, fish or purchased food. Another factor in dietary change occurs when the male head of household is absent, as seen by accounts for the other indigenous groups. Among the Cofán, when male heads of household are away, women eat meat that has been previously hunted and smoked by the men. Just one woman reported eating more purchased food, with the rest stating that their food habits do not change, that they eat the same local foods, game and fish.

The main places to purchase food are Poza Honda (about eight hours up river by motorized canoe), Lago Agrio, and the local community food store. Popular purchased foods include rice, noodles, canned sardines and tuna, sugar, salt, onions, cooking oil and lard. Food is purchased because of its flavor, because it is perceived as a necessity, or when hunting is difficult or there is a scarcity of game or fish. Most of the time food is bought once per month, but some households purchase it only two to four times per year. Generally both the male and female household heads make the purchasing decisions together and both go to buy the food. Even if they could afford to buy all their food, most women said that they prefer to eat game and fish instead. Only a few wanted their husbands to engage in wage labor to get money to buy food.

In terms of wage labor, two of the eight male respondents have never done wage labor, and two others worked as oil company employees and agricultural laborers over 10 years ago. The other half worked in tourism or scientific research, one also owning a small food store. Zábalo is a community that differs from the other Cofán villages—and indeed the vast majority of indigenous communities in the Ecuadorian Amazon—in its dedication to tourism and in collaborating with ecological projects, for

example with the Marshall Field Museum of Chicago (in turtle raising and monitoring various plant and animal species). With four community-operated cabins, an interpretation center, and a series of trails, Zábalo plays host in varying scale to an average of 3000 visitors annually (Borman 1999: 50), many of whom come via the Ecuadorian agency Metropolitan Touring (and its "Flotel," a floating hotel). In 2001, tourism declined due to both international events and worries about the security implications of increasing conflicts along the Colombia border. The Transturi Company ceased its activities and most of the study population lost their jobs. During the five months of the ethnographic study, only two tourist groups entered the community, so only a few residents were able to earn some limited cash income. Tourism work normally pays $2 to $3.20 per day. Fortunately, a quarter of the residents were and continue to be involved in a turtle raising project, sponsored by the Museum of Chicago, earning $100 to $150 per month. Both types of jobs permit residents to continue their traditional hunting, fishing and agricultural activities and avoid abandoning their homes for long or short periods of work away from the community. This flexibility has enabled households to weather the vicissitudes of the tourist season or the outside-sponsored project.

No women have been involved in wage labor and no woman at the time of this study was engaging in any wage labor. Both men and women said that it is neither desirable nor acceptable for women to engage in wage labor because a woman can get married to a colonist, which would make it possible for the outsider to move into Cofán territory. A minority opinion supports a woman working after she finishes her studies. Outside of wage labor, women earn money selling handicrafts (described below), and a few sell domestic animals: three sold one or two chickens in the previous month, and four more sold one to five chickens during the last year. Girls also earn money through making handcrafts. They do not do salaried work, but three-quarters of the interviewees said that they would like their daughters to work in tourism (e.g., as a cook) at the age of 17 or 18. All respondents stated that they would like their daughters to learn Spanish, get a good job, and then get married and raise a family.

As for attitudes towards men's work, a minority, or 3 of the 8 women respondents, said that they do not want their husbands working in wage labor away from the community. Others noted that their husbands are already working but inside the community, while two women want their husbands to work away to earn cash to buy goods and to have money for health care and emergencies. But all prefer their husbands in the community instead or working away. Parents want their sons to study and then get a good job; half said that after studying they want their children to help in community matters. Some parents would like their sons working in tourism, agriculture, or as teachers.

The Cofán of Zábalo do not engage in the sale of agricultural products, meat from forest animals, live animals, or timber. The entire community is inside the Cuyabeno Wildlife Reserve and there are rules against these activities. Instead, the community has focused on earning money from more

ecologically-benign ventures, such as turtle raising, ecotourism, making handicrafts, and assisting researchers. As noted above, in 2001, labor patterns changed as tourism drastically declined. Reidents did not have enough work or a market for their handicrafts, so they turned to agricultural activities. One man said that he is cultivating corn to sell in Lago Agrio.

Handicrafts are an important source of income. All the men except one are involved in this activity. They make balsa birds, blowguns, lances, arches, baskets, knifes, *shigras* and hammocks. To produce a balsa bird requires about two hours, a blowgun 2 to 3 days, a basket 4 days, a bow or a knife one hour, and a spear one day. It takes a month to make a *shigra* and a year to make a hammock. In 2001, they charged $5 for a balsa bird, $10-$40 for a blowgun, $5 for a spear, $4-$10 for a bow, $4 for a knife, $10 for a *shigra*, and $100 for a hammock. Evidently the prices are not very closely tied to the labor time required. All handcrafts are made with local non-timber and timber products collected in their gardens or in the forest. Annual earnings from the sale of handicrafts vary from $200 to $500 per household. Women play an important and valuable role in this activity, which is their main source of income. In the previous year, every woman surveyed made *shigras*, bracelets, seed breastplates (*pecheras de semillas*, or seeds weaved into a net and worn on the woman's chest, over her other clothes) and necklaces. The estimated time to make a necklace is about four hours and it sells for $2. Bracelets require half an hour to an hour to make and sell for $1 or $2. To make breastplates, women work for one day and sell them for $5 to $6. To make a *shigra*, they work anywhere from three days to one month and sell it for $10. Women reported an income of $9 to $56 per month or $150 to $400 per year, and account for most of the household earnings from handicrafts. Women make their own decisions about how to spend what they earn from wage labor, handicrafts and tourism work.

Cofán Agricultural Patterns

As noted above, the Cofán residents of Zábalo do not generally produce crops for sale. Agricultural activities are predominantly for family consumption. Here we describe the general patterns of Cofán agriculture, including crop selection, fallow practices, use of external inputs, labor activities, and raising of domestic animals.

Of the 18 households surveyed, the total number of agricultural plots is 50, with a mean number of *chacras* per household of 2.8 (median=2). Four of the 18 households (28%) have one *chacra*, eight have two *chacras*; one has three, two have four, and one each has 5, 6, and 8. The main crops are plantains (grown on 33 of the 50 *chacras* of the 18 households, or 66%), *oritos* (n=28, or 56% of *chacras*), manioc (n=16, or 32 %), and corn (n=6, 12%). Secondary crops include fruits such as *zapote*, peach palm, guava, forest grapes, and guavas. Approximately 5% of the *chacras* are in fallow, in the sense of having been used within the past ten years but not being used at the time of the study, except for

picking fruit from remaining producing trees. While a quarter of all the *chacras* contain just one cultivar, be it manioc, corn, *oritos* or plantains, most have a diversity of crops, either inter-planted or planted in separate areas of the *chacra*.

The duration of use of currently active agricultural plots varies considerably, from three months to 20 years, the mean being 12.7 years (median=13). It is unclear how long the plot was actively used for cultivation; the longer durations given probably involved periods of both active cultivation and fallow. Fallow practices differ widely: some informants said that they never re-cultivate a plot, while others stated that after a "long time" such as 20 years they return to an area to clear it and use it again. For the Cofán, plots no longer in "active" cultivation are still used for some time afterwards; certainly plots in fallow are far from being abandoned. In terms of post-cultivation use, plantains, *oritos*, bananas and other perennial or semi-perennial trees that continue to produce fruit continue to be harvested, so *chacras* continue to provide food for the family as well as for forest animals, making an abandoned *chacra* also a good hunting place.

Garden areas are flat and higher than river level to avoid flooding. The Cofán prefer to have their *chacras* close to the river rather than in uplands, avoiding areas heavily shaded by large trees. In terms of soil selection, brown, black and sandy soils are preferred to red or white clay. While any crop requires good soil, this is especially true for manioc and banana varieties. The size of the garden depends on the availability of labor (and hence family size) and the location or distance from the house. 10 of 18 informants said that the size of agricultural plots has not changed significantly over time since everyone in the community works about the same and there is a community norm limiting cultivated plots to 50m by 50m. However, seven respondents said that their gardens are smaller now than before. They attributed this change to the increased involvement of residents in tourism and turtle raising, rendering *mingas* for agriculture less common than in the past. Thus people work alone on their *chacras* and do not want to put in the greater effort required of a larger plot. Just one respondent said that he has more land in cultivation now, which is needed to support a larger family.

Strong winds and storms, floods, insects, animals (crop predators) and weed infestation all can cause misfortunes in the Cofán gardens. There is no known way to prevent these problems, and no residents use insecticides or pesticides. Since they do not produce crops for the agricultural market, the Cofán are not increasing their garden sizes, nor are they using external agricultural inputs. One household used to sell plantains, manioc, bananas, *oritos* and papayas to the Flotel Orellana, but since that tourist boat is no longer active, there is no one nearby to whom to sell. The Cofán do not plant monocrops and do not grow surplus produce to sell, although three women said that they would like to sell corn, coffee and cacao in the future. When asked whether crop selection has changed over time, everyone said that they are still growing the same crops as in the past, and most also said that they do not want to adopt new

ones. Five women said that they would like to grow new crops, such as watermelons, oranges, guavas, peanuts, beans, rice and squash, but just for domestic consumption. None of the households use agricultural inputs such as fertilizers or pesticides.

In terms of the agricultural calendar, many garden tasks such as clearing, planting, and harvesting can be done throughout the year, but some tasks such as cutting big trees and burning are done in the drier months from August through February. The sequence of agricultural labor begins with clearing smaller trees and vegetation with a machete, done once a year for two to seven days. This is followed by the felling of big trees for two to four days with a chainsaw or ax. Then the vegetation dries for about a month, and is burned for one to four days. Corn is planted from September through December during a quarter moon. Weeding is done for one or two days for two hours, followed by harvesting. Tools such as machetes, axes, chainsaws, handmade digging tools called *yanyacu*, and wild cane sticks are used for these tasks. Men and women collaborate in all tasks, although men participate more in cutting big trees and planting. Although patterns of agricultural labor have not changed significantly in recent years, some people mentioned that women used to work more in the past. Children also help in agriculture by clearing, weeding, planting and harvesting.

Besides assistance from offspring, another source of agricultural labor is through *prestamanos* and *mingas*. A minority (7 of 18 or 39%) receives help in the form of *prestamanos* from close relatives and neighbors in tasks such as cutting trees, slashing and planting; of these, three households received help once and one received it three times in the past year (the other three households had not engaged in *prestamanos* the previous year). When they were asked if they work in other people's gardens, three respondents said that they helped others with clearing, cutting trees and planting, but the vast majority (15 of 18) said that they did not participate in *prestamanos* in the past year. In contrast, most people take part in *mingas*. Almost three-quarters (78%) use *mingas* to clear and plant plantain and manioc. Only four respondents said that they do not organize nor participate in *mingas*. In these household-level *mingas*, the organizers provide food and *chicha* for the participants but there is no cash payment. Besides these two kinds of labor sources, three households reported hiring other Cofán individuals (two from Dureno and one from Zábalo) to clear their plantain and corn plots. A full day's work was compensated at the rate of $5. No changes were recorded in the use of laborers or their origin.

Except for one family, every household raises chickens (ranging from 7 to 60 birds at the time of the study); five of these families raise ducks as well (ranging from 1 to 8 ducks). Two women said that they have bartered these animals within the community with relatives; for instance, in one case, a bird was exchanged for a dog. Although there is some minimal sale and exchange, the main use of domestic animals is for household consumption. Opinions are divided about whether they raise more or fewer fowl

than in the past. In the past year, one member of the community bought a horse and brought it to Zábalo. This provoked controversy in the community since horses are prohibited.

When asked whether young people hold the same beliefs about agriculture, older residents generally think that the youth tend to work less now, as both girls and boys do not help as much with agricultural tasks, instead studying or being idle in the house. Despite this, most parents hope that their children will remain in the community, working on their plots and keeping the same lifestyle, but others see that many young people prefer a lifestyle outside the community. One worries that, "They could be transformed into white people and won't like to be Cofán."

Cofán Resource Use and Conservation

In this section we describe hunting patterns, game taboos, fishing patterns, gathering activities, use of timber and non-timber products, and people's perceptions of resource scarcity and conservation.

Young Cofán boys hunt alone for the first time when they are about 12 years old, though some start as early as nine. But boys begin to accompany adult men in hunting expeditions as early as age six. Fathers teach their sons about hunting, game taboos and use of hunting weapons. Although half of the men reported having blowguns when they were young, the most commonly used weapon now is a firearm, which is acquired by a young man through his own purchase or as a gift from his father. Currently, people hunt with different kinds of firearms: shotguns, rifles, and carbines. Other hunting tools include machetes and traps. Most men know how to make blowguns, spears, knives and bows, but mainly sell them to tourists nowadays. Around half of the 11 adult males who responded hunt at night with a flashlight, and eight (73%) use dogs, just as their fathers did. Dogs can smell game and track prey, especially rodents. To make a dog a good hunter, some men said that they put some smashed plants such as *guanto* into the dog's nose.

While hunters usually hunt alone, 9 of the 11 (82%) men said that their wives sometimes accompany them, bringing *chucula,* cleaning and butchering the game, and transporting it. Of these nine women, four carry their own weapons, such as another gun or machete, to hunt for themselves. However, women do not hunt alone. Similarly, boys participate in hunting but not girls, and females usually participate in hunts only after they are married. Group hunts are organized whenever anyone in the community has seen a tapir or a group of prized peccaries. If a single hunter catches a big mammal such as a tapir, he will return to the community to ask for help in transporting it and will then share it.

The frequency of hunting has declined; in the past, people used to hunt with a median frequency of 3.5 times per week, now they go once a week. Although residents go less frequency, they are hunting longer and farther away from the village. In the past, the median duration of a hunting trip was 3 hours, and the median distance 2km, but now Zábalo residents spend a median of five hours per trip and travel 6

km. Of all informants, just one said that he goes on a multiple-day hunting expeditions, and this is only once a year. Out of ten attempts, hunters fail on average twice, returning home empty-handed. In Zábalo, people choose from over five different community hunting trails; no specific preference is stated, but three of them said that they use their own trails, which are located close to their houses or upstream along Zábalo River.

Men reported that they used to eat forest meat more frequently when they were young. Animals commonly found and hunted include peccaries (Collared and White-lipped), rodents (such as agouti, paca, and acouchy), a variety of birds (tinamous, guans, curassows, etc.), and monkeys. All of these animals were listed as favorites to eat. However, interviewees said that it is now harder to find many of these animals, including peccary, tapir, coati mundi, acouchy, agouti and guan. We have an idea of the numbers of each animal hunted during the first half of 2001 through post-hunt interviews. With 120 hunting expeditions recorded, encompassing 491 animal encounters, the Cofán residents of Zábalo represent the largest post-hunt dataset by ethnicity in our study. For 452 of these encounters, we know if the prey animal was captured or not, and 378 (84%) were caught, for a kill versus encounter ratio of 0.84. In 368 encounters, we have data on the equipment used, and of those 81% (n=298) involved firearms. The most frequently caught prey in Zábalo were (in descending order): acouchy (*Myoprocta* sp., n=67); Woolly monkey (*Lagothrix lagothricha*, n=54); agouti (*Dasyprocta* sp., n=48); Cracid birds (Family Cracidae, includes guans, currasows, and trumpeters, n=36); toucans (*Ramphastos* sp., n=26); tinamous (Family Tinamidae, n=25); Collared peccary (*Tayassu tajacu*, n=20); armadillo (*Dasypus* sp., n=19); paca (*Agouti paca*, n=18). Overall, rodents were 123 of 378 captured animals (33%), birds constituted 87 (23%), and monkeys constituted 84 captured animals (22%). The informants still perceive an abundant game population, although not as plentiful as before due to hunting pressure diminishing the number of animals.

Taboos against eating certain animals have changed, and almost half of the informants said that they now eat animals that they formerly avoided. The dietary prohibition of animals such as parrots, toucan and deer is related to the ritual of *yagé* (*Banistereopsis* sp.). Examples of former taboos on game consumption, which have been lifted, include dogfish and black frog, which were said to cause one's hair to turn white. Other informants mentioned that they used to not eat howler monkey or *paraguaco* monkey, but now do. Currently the Cofán do not eat raptors or scavenger birds (e.g., black vultures, eagles, caracaras, hawks, harpy eagles, etc), anteaters, jaguar, fox, boa, giant armadillo, sloth, porcupine or otters.

Besides hunting, residents of Zábalo also fish. The Cofán begin fishing as children, between the ages of 5 and 10. The methods used are hook and line, *barbasco*, harpoon, and weighted nets (*atarraya*). The items used for fishing are considered private property, but are often shared. Half of the families

borrow *atarrayas*, nets and hooks, and in return give the owners part of the fish they catch. The Cofán usually fish alone, but sometimes go with a partner. When fish are abundant, a group of families may fish communally in the outboard canoe, splitting the cost of fuel. The Cofán of Zábalo fish a median of 3.5 times per week, for 4 hours, a pattern that does has remained steady over time. On average, more than eight of ten fishing attempts are successful, with many saying they never come back empty-handed.

Fish are available year-round, but are more abundant between November and March, declining when the rainy season begins. Many species (e.g., *pintadillo, paco, picalon, and barbudo*) are easier to catch in the summer months when the levels of rivers and streams are low and the river is calm. Adults reported that they used to eat more fish when they were younger. However, a possible small change in the abundance of fish does not seem to have had much effect on the Cofán diet since people feel there are still enough fish in the river. Every family eats fish almost every day. The most abundant species are: *bocachico*, sardine*, barbudo, picalon, masaca, zabaleta, caropitas, piraña, motas, palometas and bagre;* the fish which are pursued most are *masaca, bocachico, barbudo, picalon, pintadillo and caropitas*. The Cofán people have not changed their dietary patterns with regard to fish in recent decades.

Going back to terrestrial resources, informants reported a long list of non-timber forest products harvested, e.g. *quenene,* wild garlic*, sumbu, etsuchu, ata, abue, jambi, yoco, tentecu, ninacuro* (worm), wasps, *chambira, shasha, chocho anunucho, cushinsasha, bacasimachu, pambil, shishijechu,* and *tagua* (vegetable ivory), a diversity of palm trees, *makabo, nisperos, fansoco,* white cacao*, guaba (inga sp.), chambira, caimito, cangupachu, tainjachu, mejochu, morete*, and *zapote*. The input/output household diaries show that of 448 household-days, 13% witnessed the collection of some non-edible forest product. Of these 65 non-timber products, 86% are plant and 14% faunal resources, used 37.7% for medicinal purposes, 32.1% for fire, 9.4% for construction, 5.7% for handicrafts, and 1.9% of the time for domestic purposes.

To harvest these forest products, people use machetes (and occasionally chainsaws when felling a large tree) to gather leaves, bark, resin, fruit or seeds. While most seeds used in handcrafts are just picked up off the ground, other items are collected by men or women climbing trees or just taking off parts of plants. To preserve plants and trees, the Cofán have established the rule that products should be gathered only when necessary, and that some trees must never be cut down, so that useful/edible products must be collected from the standing tree. There are also cultural rules prohibiting women from collecting hallucinogenic plants and *yoko* (a stimulant plant).

In terms of timber products, a variety of species such as *pechiche, congiucho, sangre de gallina, cedro, capirona, manzano* and many species of palms are used for house construction, canoe construction and firewood. Trees are cut down only for subsistence purposes; it is illegal to sell wood to logging

companies or other outsiders. Breaking the rules about the use or collection of timber and non-timber forest products results in a monetary fine imposed by the community.

Although population growth is increasing hunting pressure, residents do not report a drastic change in either game or fish abundance. The Cofán of Zábalo still enjoy productive fishing and hunting excursions, made possible through their low population density and sanctions against improper exploitation of the forest. They have established certain zones in the communal lands acceptable for hunting (for instance the southern area is designated as a reserve for birds and monkeys), and inside these zones only certain species of animals can be taken. In terms of fishing, dynamite and *barbasco* are not allowed in the Aguarico river. *Barbasco* poison is allowed only once per year in streams. The existence of resource use rules in Zábalo is facilitated by their location in the Cuyabeno Reserve, their focus on ecotourism as a main source of income in a community far from any market town, and by the leadership of Randy Borman. According to the agreement between the Ministry of Environment and Zábalo, rules exist regarding the use of Zábalo lands. An area of intensive use exists along the shores of the Aguarico River, comprising 7,000 hectares, where subsistence activities are allowed. This is surrounded by an area of 25,000 hectares where less intensive or extensive forms of land use are permitted, notably fishing, hunting and gathering forest products. Beyond this is the area of conservation, where only scientific research and ecotourism are permitted. Finally there is an area where not even those activities are legal, an area of maximum protection of 5,000 hectares (Albuja *et al.* 2001). What is not clear, however, is the extent to which residents actually follow these rules.

Apart from rules and sanctions, most people want to preserve resources for future generations in the hope that their children will enjoy the same forest. They identify outsiders as the main threat to the natural environment. The Cofán have seen elsewhere how the entrance of oil companies, logging companies, and *cucamas* (outsiders, colonists) can destroy the forest and cause environmental problems. To them, a healthy forest is one with plentiful resources—animals, trees, medicine, handicraft and construction materials—which provide food and "a good place for their family." It is also a forest without *cucamas*, free of petroleum companies, and unmarred by pastures and cows.

Many Cofán define "conservation" as the preservation of animals, the river and the forest. Some informants framed their definition by what a conserved area lacks: it is a place without a road, notable for the absence of *cucamas*; it does not have large areas dedicated to agriculture; there are no cows or pasture; and animals are not captured for sale. Others emphasize what conserved areas possess, specifically medicinal plants, a forest where one can hunt, and abundant sources of food. For the Cofán of Zábalo, the forest is a source of subsistence as well as a place of cosmological significance (Califano and Gonzalo 1995). For instance, spirits (*cocoya*) inhabit lagoons and can cause sickness and kill people. In addition, the *añuno* lives in the water, looks like a *gringa,* attacks toddlers and small children, and

afflicts women with menstruation. Animals also have *cocoyas*, and jaguars are of particular significance because shamans can possess them. The shaman plays an important role linking the Cofán with the spirit world, since he is the only one who can cure these illnesses and is also seen as being able to remedy scarcity of game by calling animals when they do not appear.

Cofán Perceptions of Outsiders and Aspirations for the Future

Since the establishment of Zábalo, the Cofán have been in contact with a diversity of outsiders. Some of the most significant interactions have been with petroleum companies. Generally, the Cofán do not have good feelings towards oil companies, suspecting they will contaminate the forest and the rivers, reduce hunting and fishing, and bring illnesses. They do not like *cucamas* in general, worried that they will marry Cofán girls and/or invade their territory. Given the history of the Cofán with oil companies and colonists, these concerns are understandable. The situation of the Cofán has also brought them into contact with non-governmental organizations and foundations that have developed projects for the community, such as the turtle raising project. In addition, as with this NIH project, researchers have come to learn from the Cofán of Zábalo. The Cofán generally have positive feelings for these outsiders, perceived as interested in helping the community and potentially offering work. However, some residents are skeptical, tainted by the experience of past researchers making promises that were never fulfilled such as goods that were not delivered. Most perceive tourists as beneficial for the community, a source of income and a market for goods, but also a potential source of illnesses. The Cofán have some contact with government officials, but offered no comments on this contact. Finally, the Cofán of Zábalo have friendships with other indigenous communities and visit each other for sporting events and other festivities, which everyone enjoys.

Through their contact with others, the Cofán are aware that outsiders are different since they speak a different language and have different eating habits and styles of dress. They see that their Quichua neighbors wear Western clothes, which is looked upon unfavorably. One interviewee said, "They are different in their language, habits and the way they dress. The Quichua dress as White people, in pants and shirts." The Cofán worry that the younger generation will not want to live in Zábalo and will thereby be transformed into *cucamas*. Their strong disapproval of this is reflected in a dislike of outside culture. They consider *colonos* to be exploiters of the forest, and outsiders in Lago Agrio, Coca and Quito as dangerous. However, one informant stated that the difference with outsiders is simply the language: "we are the same, they just speak a different language."

What types of outside contact do the Cofán of Zábalo view as desirable or needed? In contrast to other indigenous communities, they do not seek outside assistance for their agricultural plots (though one respondent mentioned needing tools). Currently, they are most interested in assistance with getting

electricity, constructing a medical center, improving the school, and finding support for student scholarships. They also would like to have a functioning outboard motor, chainsaw, and lawnmower for community residents to use.

The aspirations of having a medical center and a better school are related to the idea of development. People were asked about the meaning of "development." A third said that they do not know. The other two-thirds defined "development" as increasing sources of work, so more people can work and save money to acquire food, goods and services. Development is tied to markets, as well as having a medical center, electricity, potable water, and education. Others mentioned that development signifies life without pollution and oil companies, and maintaining the forest and game populations. In contrast to the dominant view that roads and markets bring progress and development, the Cofán feel that roads bring more disadvantages than benefits because Whites and *colonos* can then invade their territory, bringing theft, conflict, and bad attitudes. Outsiders could also then deplete game through hunting and noise. The Cofán would then not have enough food and their peaceful life would be disturbed. One person said that the only benefit of markets and a road would be getting out easier to buy food.

Despite the view that the forest provides for most of their needs, three-quarters of the Zábalo residents said that it is not possible to live without money, because they need it to buy things like salt and ammunition. The other quarter stated that they could live without money, but still would need to buy salt.

If given a choice between living in the forest and the city, everyone said that they prefer residing in the forest. A variety of reasons were given: there is enough food and animals to hunt and fish, they feel well adapted to the forest, and the forest is not dangerous or expensive like the city. Even if they had enough money, they would still rather live in the forest. Most said that cities are good for visiting and buying food and goods, but are expensive, chilly (Quito), and noisy. They also feel that small Amazon cities such as Coca and Lago Agrio are dirty, smell bad, and are dangerous because there are *delincuentes* and murders.

People were asked about their consumption aspirations for food, goods and services. It is striking that everyone would like to consume more fish and game, demonstrating a strong preference for non-purchased foods. But, if they had enough money, they would also like to buy foods such as sardines, rice, beans, noodles, salt, sugar, onions and cooking oil or lard. For the home they would like to have generators, stereos, pots, machetes, dishes, TVs, refrigerators, metal roofs, ammunition and firearms, and things for personal consumption and children (clothes, shoes, watches, and school supplies).

When asked about their educational aspirations for their children, most parents say that education is important, but their aspirations differ by sex of child. They want their sons to finish high school and even attend a university, and then get a good job or help the community. They want their sons to live in the community, help with agricultural tasks and community matters, hunt and fish, and be in close

proximity to the family. On the other hand, although some respondents said that they want their daughters to finish primary school and some even mentioned high school, most said that girls should get married and start a family, and limit their career work to making handcrafts. Though the usual cultural practice is for girls to leave their parental home and community to live in their husband's community when they get married, some said they still would like their daughters to live close to them.

The residents of Zábalo are optimistic about future resources and opportunities in the community. Although some think the forest will change, that resources will diminish, and there will be more pressure upon resources, most believe that there will be enough resources for their children. For example, when asked about the sufficiency of agricultural land, everyone said that the number of plots will increase, and that plots will be extended further into the forest. However, they also think that the forest will not disappear, but will continue to regenerate and maintain itself. If there will be any significant increase in pressure on their land, it is thought that it would be a consequence of external factors. For instance, as one person said, "Maybe [the forest] disappears because *colonos* invade our territory." A bigger worry is that young people will want to live outside the community, and will thereby essentially become *colonos*, with the result that the Cofán culture will disappear. In the words of one informant, "Young people are studying so they can live outside the community." Another respondent commented, "[Young people] could be transformed into white people and will not be like the Cofán." Their desires to have their children study and stay to help in the community and their interest in ecologically-oriented projects reflect the Cofán residents' wishes to protect their culture and environment for future generations.

THE SECOYA

[Flora Holt, collaborating investigator, with Secoya leader. Photo: Gabriela Valdivia]

The Secoya Indians of Ecuador live along the Aguarico River and its tributaries—the Eno, Shushufindi, and Cuyabeno. They are descended from the "Encabellado," which was a large population in the northwestern Amazon Basin described by Jesuit and Franciscan missionaries in the 17th and 18th centuries, and belong to the Western Tukanoan linguistic family, which is located in the upper Amazon basin of Colombia, Ecuador and Peru (Vickers 1989). At one point thought to have about 12,000 people, their population plummeted following the conquest due to deaths from sickness and slavery, and fell further around the turn of the twentieth century during the rubber boom (Cabodevilla 1989, 1997; Vickers 1989). Currently, the Secoya number only about 700 people in both Ecuador and Peru. The Secoyas in Ecuador (estimated at 338 persons) live in three communities: San Pablo de Canteseaya, Centro Siecoya Remolino (Sewaya), and Campo Eno (De la Torre *et al.* 2000). They together constitute the OISE (*Organización Indígena Secoya del Ecuador*) and had a territory of 32,414 hectares in 1989. The Secoyas live in scattered households or small villages along the banks of rivers and streams; these settlements traditionally were relocated every 5 to 20 years, though the fact that they have specific territorial boundaries now makes this much less likely in the future. In 1996, the Secoya of Sewaya gave their community the legal name of "Centro Siecoya Remolino," which encompassed 23,000 hectares. In 2001, through an agreement with the Ministry of Environment, the territory was enlarged by adding 2,807 hectares from the adjoining lands along the Aguas Negras River (De la Torre *et al.* 2000). The discussion below draws upon information from 97 persons of 20 households constituting the Secoya community of

Sewaya, located along both the north and south banks of the Aguarico River, in the province of Sucumbios.

Secoya Demographics

Of the 97 individuals living in the community of Sewaya, 50 (51.5%) are male and 47 (48.5%) female, giving a sex ratio of 1.06. Almost half the population (45.4%) is below the age of 15, with 28% being of school age, from 6 to 14 years old. Higher proportions of the adults were born in the community than is the case for the other ethnic groups studied here—51% of the women and 50% of the males over age 15—reflecting the established character of Sewaya.

Secoya is the predominant ethnic group, with only four outsiders living in the community: two *colonos* from the coastal province of Manabí (one male and one female), a Quichua woman, and a Secoya male from the main Secoya community of San Pablo. All four outsiders are married to community residents. Except for one *colono* woman, the Secoya language, *Pai Coca,* is spoken by everyone. Two adults (defined as people above age 12) are monolingual in this indigenous language, and the rest are bilingual with Spanish. Of these bilingual adults, seven speak a third language, and one couple a fourth one as well (Quichua and Cofán).

In terms of marriage patterns, the Secoya are monogamous. Of 20 couples surveyed, six are living in *union libre* and 14 are legally married. Most people have been married only once, though five have been married twice. Many of the *union libre* arrangements are the result of two years of stable cohabitation and acceptance by communal consensus. There is no official ceremony for weddings; usually a relative of the male (e.g., the father) marries them at home, followed by a party with food, drinks and music. However, a few couples were married in a church ceremony and one in a civil ceremony. No one is divorced; culturally the Secoyas look upon separation or divorce unfavorably. In three cases, people had to move to another community upon getting divorced. Women were married at ages ranging from 12 to 23, with the average age of first marriage being 16. In most cases, they married for love (63%), with 19% arranged marriages.

At the time of the survey in 2001, the Secoya women had an average of 2.3 living children. Of 74 live births, 65 are still living (about 12% mortality). The mothers of the informants had an average of 4.8 children, and their maternal grandmothers had an average of 3.8 children. Women generally breastfeed their children to about two years of age. (In two cases women did not breastfeed, because of illness or lack of milk.) They unanimously feel that breast milk is good for babies and infants; it helps them grow and fatten up and keeps them from becoming sick. However, several reported that if they had the economic means, they would prefer to feed purchased foods to their babies. Others are adamantly opposed to this idea. Besides breast milk, before the child's first birthday, mothers begin to feed their

infants *chucula* (smashed cooked sweet plantain with water)*, colada* (sweetened cooked cereal with fruit), soup, meat and fish. A common health problem for children is diarrhea, which people ascribe to the children eating dirty food. Diarrhea is treated through rehydration and medication, with a fairly even split between those using medicinal plants and those purchasing oral medication (rehydration salts and immodium).

Regarding birth control, most have never heard of contraceptives, but some are familiar with native plants that can be used. However, none of the women reported ever having used them. At the same time, almost all agree that contraception is a good idea, since it can keep them form having too many children or undesired children. One woman said that she would have used it but was afraid to try, fearing that health problems would result. Another said that contraception is harmful, and no women should use it. But given that they do not use any contraception, how can we explain their relatively low fertility, the lowest of the five groups studied in this monograph? Vickers (2002) found that the Secoya have taboos and other cultural regulations pertaining to menstruation, pregnancy, and post-childbirth periods during which contact between women and men is restricted. Such rules may have significant effects on fertility.

Mortality information is limited in the ethnographic study, as most parents of the women respondents are still alive. The death of parents and grandparents is most commonly ascribed to sickness, with three reporting cases of tuberculosis and lung disorder. But another commonly cited cause is witchcraft, with two reported cases.

Regarding education, 58 (28 males and 28 females) residents of Sewaya beyond schooling age were surveyed to ascertain highest level of formal education. Six males (21%) and 9 females (32%) had no schooling; among males, of 13 (47%) who attended primary school, 8 (29%) finished. For females this statistic is 16 (57%) attempted, 8 (29%) finished. Many more males pursued a secondary education: 9 (32%) males attempted schooling past sixth grade, and 3 (11%) completed it, whereas only 3 (11%) females attempted and 2 finished. At the time of this research, no one had attended school past the second grade. Children attend school five days per week, five hours per day. Absences result from sickness, families living far away, and high rainfall, which renders canoe travel through strong currents dangerous.

Religious affiliations are divided, with half of the sample identifying themselves as Evangelist and the other half having no religious affiliation. While there is not a church in the community or regular services, there are at least two missionaries who make appearances in the community, one Pentecostal and one Evangelist. In addition, two community members act as evangelist pastors when needed, meeting people for Sunday service to read the bible, talk about it, and sing religious songs. Some residents listen

to services on the radio or go occasionally to church services in San Pablo (the largest Secoya community) or Shushufindi (the nearest large colonist town).

Patterns of migration have changed; not too long ago the Secoya people were semi-nomadic, but currently, all informants except one said that there is less mobility now than in the past. Most people see the decrease in mobility resulting from the scarcity of land elsewhere, the stability of the present community, and the community's ownership of the land. Thus no one has left in the past few years. But typically, the male head of household decides when to come and go; otherwise, it is a joint decision of spouses. The Secoyas stay in the community for various reasons, centering on the availability of land, possession of their own agricultural plot, and proximity of family in the community. Others stay because they like it, and a few because they "have nowhere else to go." Even young people do not leave permanently; for instance, one young married man periodically goes to a Quichua community to work but returns, and some young people leave for short periods to attend high school. In the last decade, three of the four outsiders mentioned earlier arrived to the community: a woman from a colonist cooperative, a Quichua woman and a Secoya man from San Pablo, all married to Sewaya residents. Apart from these recent additions, everyone is related, as seen in the fact that almost all have the same two last names, *Piaguaje* or *Payaguaje*.

Secoya residents frequently travel to neighboring indigenous (most commonly, San Pablo) and non-indigenous communities for visits, as well as to participate in Secoya meetings or assemblies. They visit the market towns of Poza Honda (a town located upstream from Sewaya, on the Aguarico River), Shushufindi, Coca and Lago Agrio for shopping, and even occasionally travel to Quito as well as Lago Agrio for business, political and communal affairs. People said that they leave the community for these various reasons from one to three times per year.

Secoya Social Organization

The basic unit of Secoya social organization is the household, which most often is comprised of a couple and their offspring, but can also include grandparents and/or daughters-in-law. The latter usually lives for a short period in her husband's parents dwelling until her husband has built a new house and cleared a plot for their first *chacra*. At the next level, the unit of organization is the community, which has as its leaders a president, vice-president, secretary, treasurer, trustee, and board of directors (*vocales*). These leaders work for the development and care of the community, with responsibilities to organize communal work (*mingas*), represent the community in federation (OISE) meetings, resolve communal conflicts, and organize social activities, health affairs, sports and educational events. Women are included in the communal leadership, and have established a women's organization to pursue projects. Every two months there is an "ordinary assembly" to discuss issues and problems of the community. The

president can also call for "extraordinary assemblies." All members have to be present in such meetings, or pay a monetary penalty.

At the next higher level is the national Secoya organization, OISE. Not long ago, the Secoya were guided by a council of elders, as was the case for other indigenous groups; however, to play a role in Ecuadorian politics, structural changes were needed. Vickers (1993) notes that the first attempt by the Secoya to organize themselves was in 1987, when they formed OISSE (*Organización Indígenas de los Sionas y Secoya del Ecuador*) with the Siona Indians, with whom they are closely related. Since they are part of the Ecuadorian democratic political process, the Secoya elect their leaders by voting. Elections occur every two years, in May.

Every Secoya man and woman aged 14 or over and living in the community is a member (*socio*). Members of the community must fulfill certain obligations, such as participating in political assemblies and *mingas*. In return they receive access to land, education, health care, and loans. To become a member, an outsider must marry a member of the Secoya ethnic group from this community, must demonstrate two years of "good behavior" (e.g., learn Secoya customs and language), and must collaborate in communal activities. After this period, the candidate can request to become a *socio*, a petition that the community either approves or rejects.

As described above, Sewaya is located on the north and south shores of the Aguarico River, with a total of 25,807 hectares. Every married male member or other male adult who can work on his own receives a plot of and usufruct rights to 100 hectares. Although a benefit of being a *socio* is access to land, women cannot hold property, so land inheritance is patrilineal. House plots are all next to the river, so everyone has river access. Behind the plots are communal lands which residents can use to hunt, fish and collect timber and non-timber forest products. Other communal property consists of the school, community house (*casa comunal*, where community meetings take place), communications office (small room with typewriter and radio), outboard motor and canoe, speedboat, and a small *botiquín* (room where some basic medicines are stored). Every member can use these places or goods after receiving permission from the leaders.

As a system of communal work, *mingas* support and maintain the development of the community and communal projects. Generally people participate in *mingas* once every two months for one day or as long as necessary to finish the job. In the year prior to our ethnographic survey during the first half of 2001, the frequency of these events increased with a rise in projects and programs; during the study period, people collaborated to construct a communal medical center and a well for every household.

In additional to the communal *mingas,* families of Sewaya sometimes organize personal *mingas,* which occur in individual *chacras* to help each other build, clear, or weed, in return for food and *chicha*. Family members or neighbors also commonly share agricultural tasks (clearing, cutting trees, planting

and weeding), through a system of *prestamanos*. Of the 410 Secoya household-day observations collected in the input/output diaries, 39% refer to participating in individual *minga* or *prestamanos*: 19% in communal *mingas*, 17% in communal construction projects, and the remaining 3% pertain to infrequent tasks, such as building a canoe, cleaning communal areas, helping in a vaccination program, and transporting timber.

There is also extensive sharing, although this does not occur according to an established time or place. Everyone said that they share game, fish, *casave* (dry flat bread, made from manioc), *chicha,* and garden products (e.g., plantain, manioc), mainly with close relatives, family-in-law and neighbors. Frequently this sharing is done during *mingas* or after a hunting expedition. About 15% of the household-day observations in the input/output diary involved such inter-household transfers; 53% were simply recorded as "food," 21% fish, 9% *chicha*, 3% forest game, 7% fruits, 2% other goods (5% did not describe the item exchanged). Items exchanged came from close relatives, including fathers and mothers (19%), brothers and sisters (17%), children (15%), and grandparents (10%), followed by brothers-in-law, parents-in-law, cousins, nephews and nieces, and daughters-in-law.

Secoya Household Economics

Following the sequence of preceding chapters, we start with a description of standard of living and dietary patterns, continue with a discussion of labor activities by sex and age, and finally discuss cultural views of wage labor.

Houses in Sewaya are built with local wood, with roofs of metal or thatch. The community does not have electricity, a sewage system, or a potable water system. However, five households own a generator, and seven have a latrine for human waste. Water for drinking and cooking is mostly collected from streams, rainfall, spring water or a well, but not from the river, which is known to be contaminated. Still, river water is used to wash clothes and dishes and for bathing and swimming. During the time of this study, people were building wells as a source of water for every household. (By the end of our study in June 2001, five wells were completed.)

Among 14 informants, women undertake the task of collecting water in six (43%) of the households (in the others, everyone helps in this chore, or no one was specified). During the rainy season, water is collected close (around two minutes away) to the house, about one to five times per day (median of twice per day); otherwise, they may travel up to an hour away during the dry season to collect water from the stream, a task done anywhere from daily to two or three times per week. When it rains often, they use tanks to collect the rainwater close to their house; otherwise more distant streams and springs are used.

Everyone uses propane gas to cook, although wood is used when they run out of propane or when they smoke meat or make *casave*. Six women said that everyone helps collect wood, two that male and female heads both do it, and the other eight said that the male head does it. For this activity, the source of wood is about half an hour away walking, and is done a median frequency of three times per week.

A review of the data from the dietary checklist of the input/output diary gives us a good idea of what people eat. The diet still significantly depends on forest-based protein sources in the form of game (eaten 43% of the days recorded) and fish (47%). These are highly valued and desired foods, ones that people said are their favorites, and ones which they want to eat daily. In lower proportions, they consume dairy products (15%), eggs (12%), and domestic animals and purchased meat (11% of the days). The most commonly eaten food (91% of the days) is manioc, a basic food in the Secoya diet eaten boiled, in soups, fried, as *chicha*, or as *casave*. Fruits such as plantains, bananas, and *oritos* (prepared as *chucula*, cooked, smoked or fried) are also eaten almost daily, on 72% of the days, followed by vegetables (32%) and beans and lentils (8%). The lowest frequencies of food consumption recorded are for nuts and seeds (5%) and insects and worms (3%), as with the other indigenous populations.

In terms of food scarcity, half of the respondents (8 of 16) said that they have never gone to bed hungry, with the other half complaining that as recently as several years ago to a week ago, they have spent a large part of the day without eating anything or even drinking *chicha* or *chucula*. Families usually eat two meals per day, but this depends of food availability. Although nine of the female informants said that there is no change in their diet when their husbands go away (since women also go hunting and fishing, and eat smoked game), this is not the case for the other seven, for whom the absence of the male head often provokes changes in the household diet. Families often eat more garden food or purchased foods (one reports eating only rice) when the man is absent, and less *chicha*, *chucula*, fish and game. Interestingly, in the case where the woman is married to a colonist, the pattern is switched; she reported eating more purchased food when he is home and more fish in his absence.

Commonly purchased foods include lard, cooking oil, onion, garlic, condiments, noodles, canned tuna and sardines, cookies, pork, sugar, flour, oats, powdered milk, rice, potatoes, pepper, eggs, powdered cocoa, coffee, salt, beans and lentils. People buy these foods because they see them as necessities, because they like the taste, or when fish and meat are lacking. Shopping for food is done weekly to monthly (a couple families do it only every three months), usually on Saturdays, and most commonly in Poza Honda or Shushufindi. Besides these market purchases, people also make small purchases in the community *tienda* or food store, in nearby stores in colonist communities, or from a businessman who travels along the river. Even if they could afford only purchased food, a majority (11 of 16, or 69%) of women said that they still would rather eat forest game, fish, *casave* and their traditional food. On the other hand, some of the younger women (5 of 16) appear to prefer purchased food.

Male wage labor is important in Sewaya, as most males have worked for petroleum companies or in tourism. Only two men have never engaged in wage labor. Of the 14 who have, only three have not worked for the petroleum companies: one worked in tourism, one was and still is working as a teacher, and the other works as a health promoter (receiving $135 per month from the *Ministerio de Salud*). Eleven of the men sampled have worked temporally (two to eight months) for petroleum companies, including Occidental, CGG, City Investing, Urazul, Seiscomdelta, Geosur, and Texaco (two of the older men, over three decades ago when Texaco was prominent in the region), doing menial tasks such as clearing the forest, guarding equipment and driving motorized canoes. Five of these also worked occasionally in tourism around and inside the community, as guides, waiters, cooks and motorists for the various tourist companies. During the study period, two finished their contracts of three and nine months, having earned $220 per month with Occidental Petroleum Company, one was still working for Intertrek tourism and earning the same amount, and another was working intermittently by himself providing tourist services.

In contrast, three-quarters of the women have never had any wage labor experience; of the five who have, three were cooks for tourism companies, one worked as a maid in a private home, and the other washed clothes for missionaries. All of these women stopped working before they got married. The jobs were all only temporary (one to two months), and, with the exception of the woman who worked as a maid, all were inside the community. At the time of the study, no woman was engaged in wage labor.

Apart from these cases of occasional stints of wage labor, how do people in Sewaya make money? A few residents have their own businesses—some related to tourism, while two others have small food shops. Another used to sell timber. In the last few years, cash cropping has been increasing among the Secoya, reaching 75% of the families now. Of the 19 families surveyed, almost 80% (n=15) sell agricultural products: 53% (n=8) sell corn, 40% (n=6) sell coffee, and 7% (n=1) sell cacao. Usually these products are sold to a middleman in the community or in Poza Honda. Prices vary, with a *quintal* of coffee selling for anywhere from $4.80 to $7, and a *quintal* of corn for $2.80 to $3.40. Men report annual earnings of $14 to $60, with an average of around $40. In addition, three women reported earnings from cash cropping in the last year, two selling manioc and fruit to tourists, the third selling corn to a middleman.

In terms of raising animals, Vickers (1993) notes that in the 1960s, the Summer Institute of Linguistics introduced cattle raising to the Siona and Secoya along the Aguarico. For more than a decade after their introduction, he writes, cattle failed to generate income for Secoya residents. In Sewaya during 2001, 15 of 17 households surveyed engaged in cattle ranching, and two among this 15 were also involved in fish farming. Three households sold domestic animals in the past year: two cows (for $200 each) and a horse (for only $10) to a middleman. One of the community leaders pushes cattle raising as a

good way to invest the money the oil companies have provided. However, up to the time of the research it has not been successful, as the Secoya do not have a tradition of cattle raising, do not kill the animals for meat, and do not even milk the cows to provide milk for their children.

Although three men mentioned that they used to sell forest animals, such as tapir, deer, monkey, and parrots, both as meat and alive as pets, no one has sold any forest animals in the past two years.

Unlike the other indigenous groups described in this project, timber sales represent an important source of income for most Secoya households. The majority sold wood in the past year (9 of 16, or 56%) and even more (10 of 16, or 63%) own a chainsaw. Species such as cedar, laurel, *guayacan*, *chuncho*, *amarillo*, *sangre de gallina*, *manzano* and *canelo* are sold to a middleman who comes to the community, in Poza Honda, or to neighbors in colonist communities. Each piece (*tablón*) of wood sells for $0.1 to $1, depending on the type of wood. People also use wood for houses and canoes. In contrast, non-timber products are collected mostly for personal use—for medicine, construction, fuel wood, and handicrafts.

Handicrafts used to be an important source of income due to the growth of tourism, but since tourism has diminished since 2000, the Secoya have had to cut back on the manufacture of *artesanías*, which now provide little income. Most men (11 of 16, or 69%) now do not make handicrafts, while the others make hammocks, baskets, squeezer baskets (used to squeeze the manioc to extract the liquid to make *casave*), and strainers and fans for personal use as well as to sell. The average time it takes to make a cotton hammock is five weeks, which sells for $18 to $100. To make a much better *chambira* hammock requires six months, but may still sell for only $20 to $120 (depending on the size). Prices vary according to how much the buyer bargains, and how desperate the maker is for cash. For the smaller handicrafts, they spend from two days to a week per item, and charge $1 for a fan, $4 for an strainer, and $4-$15 for a basket.

In contrast to the men, women continue to be engaged in making handicrafts. Three-quarters make *shigras* or *chambira* bags, ceramic dish pots or cups, and necklaces and bracelets with beads and seeds from the forest. Prices are again highly variable: a collar or bracelet sold for $0.40 to $5, a shigra for $5 or $6, and ceramics for $1 to $10. Handcraft sales are not a regular activity. For example, women had no income from this activity in the previous month, and in the last year earned anywhere from $10 to $180. As with handcrafts, raising domestic animals is an activity under women's domain that provides them with their own income. Every household in Sewaya has chickens and one raises pigs as well. A majority sells domestic animals to an intermediary, usually to a river businessman, for $2 to $5 each; this provided these households with $4 to $40 in the previous year.

How acceptable is it for women in Sewaya to engage in wage labor? Not very, as 12 of the 16 men respondents and 13 of the 16 women said that women should not engage in wage work. They said it is against Secoya traditions. Women should stay in the community, raising chickens and making

handcrafts, and that girls should stay close to the home, get married and start their own family. However, the other four men and three women think it is fine for women to work for short periods of time; some of these think that girls should study and have a career. In a different question, women were asked if they want their husbands to engage in wage labor; 10 (63%) said that they would like them to work, to earn money to buy food, medicine, clothes and other goods. But four (25%) do not want their husbands to work in wage labor, and two did not give an opinion. Nine of 16 (56%) would like their husband to live in the community rather than work away, while the other seven (mostly younger) prefer that their husbands work outside the community to earn more money.

Secoya Agricultural Patterns

This section describes general agricultural patterns of the Sewaya community, including a description of cropping patterns, external inputs, labor practices and inputs.

Every household works its own agricultural plots, with 17 households surveyed having one to four *chacras*, the average being 2.2. The principal crops are plantains, bananas, manioc, corn, coffee, and cacao, followed by secondary crops such as rice and perennial fruit trees, including *guaba (inga sp.*), guava (*guayaba*), tree forest grapes (*uvas de arbol*), *zapote*, lemon, peach palm, papaya, coconut palm, *naranjilla, majaro*, *poma rosa* and *araza*. Corn, coffee and cacao are produced for the market, and the rest are for subsistence. Of the total of 38 *chacras* belonging to this sample of 15 households, nearly half are monocropped in manioc (8), plantain (5), or corn (2). Thus over half are polycropped in one to three crops of the primary and secondary types listed above.

Secoya *chacras* are used for cultivation for 10 to 18 years; after one to four years of active cultivation, they are left in fallow for two to ten years (median=8). Again, fallow does not mean abandoned, as people unanimously said that they still go back to their *chacras* to collect fruit from perennial trees, such as forest grapes and peach palm. Less frequently, some also hunt in these fallow *chacras*. The general pattern of cultivation is as follows: a new garden is cleared and manioc and/or plantains planted; after fallowing, corn in planted and later perhaps coffee, or else then to pasture.

Quality of soil and distance from the house are important factors determining site selection for *chacras*. Proximity to the house is important to decrease travel time as well as increase monitoring of animal pests. Good sites can be discerned only through close study of the terrain and knowing the land well. Some informants look for flat land and many make sure that if the land had been used in the past, it has recovered its fertility. One informant said that he divided up his farm so that he would use a small portion every year. Two people indicated explicitly that they consult with their spouses on crop location. Humidity, color and texture of soil are all important factors in selecting both the place and the crop to be planted. Clay, rocky or mountainous, red or white soil is considered to be poor, whereas good soils are

black or brown, not too humid, and for manioc, should be sandy. Good soils are especially important for manioc and other crops that they grow in quantity, such as plantain, corn, coffee, rice and fruits.

Garden sizes depend on family size, topography, availability of labor, and destination of crop (whether for household consumption or market). Ten of the 15 men responding said that they have smaller gardens than others because they do not want to work much, since they have a small family, and/or they lack tools. Three said that their gardens are bigger than those of others**,** because they have a large family or because they work harder. Two of the latter three said that there has been no change in the size of their gardens compared to the past, and they have the same average size gardens compared to the others now.

Crops have changed over time: formerly there was more coffee and cacao, mainly coffee. But after prices fell sharply, many farmers turned to other crops, especially corn. When men were asked crops they would like to adopt, there were two categories of responses: new crops to grow so new foods could be added to their diet, and crops with a good market value. The former category includes peach palm, watermelon (for children), *caimito*, tomato, black pepper and pineapple. Cash crops some farmers would like to start growing include black pepper and rice, and respondents also mentioned an interest in *pisicultura* (fish farming), which has been started on a small scale. Others said that they would like to increase or adopt cash crops of corn, cacao and coffee. Besides new crops, several mentioned that they would like to increase land in pasture for cattle raising. Many Secoya farmers have already planted pasture and have cows being raised for market sale, and within the past few years they all increased use of external inputs to control weeds in the pasture. These farmers are currently using chemicals such as Gramoxone ($2 per liter), Tordon ($2.40 per liter), Tordon 101 ($6 per liter), Amenapac ($3.40 per liter) and Glisofato ($3.40 per liter), all to fumigate pasture and kill weeds or *malezas*. Most reported the results of using these chemicals as satisfactory, with no side effects. Three said that they are using more than before, while the other two reported using less. Apart from the use of these chemicals in pastures, there is no use of pesticides, insecticides or fertilizers for other agricultural purposes or plots.

Forest animals can damage crops in *chacras*, as almost all farmers agreed. Among the most frequent thieves are rodents, monkeys and birds eating corn, manioc, plantain and other crops. Moreover, insects are ubiquitous, and many farmers reported significant losses in the past month or two. Finally, inclement weather can damage crops; several commented that storms felled trees, which damaged crops, and the river overflowed and flooded their fields.

Most agricultural tasks are carried out throughout the year, although there is a usual sequence. Secoya farmers first cut and fell big trees, clearing and burning it during the drier season (November through January), then they plant (manioc, plantain and/or corn) from January to February, weed (repeatedly, through the growing season), and harvest (according to the crop). They commonly use a

chainsaw and ax to cut big trees, a machete for clearing, weeding and harvesting, and sticks for digging and planting. Both males and females participate in these labors, with the exception of cutting trees, which is done by men.

Members of the household work actively in these agriculture tasks. However if extra help is needed, other kin as well as non-kin may assist through the system of *prestamanos*. About two-thirds of the informants take part in *prestamanos*, receiving help from 5 to 10 people from one to ten times in the last year. The *prestamanos* is mainly for planting and weeding manioc, plantain, coffee and pasture. Furthermore, *mingas* are more common in this community, with all households (with the exception of one older man) helping in *mingas* for sowing, weeding, making a fish farm pool, and building a canoe. Seven to 15 people, with an average of 11, took part in these *mingas*, all receiving food and *chicha* in return. Informants reported that the last time *mingas* were held was 3 to 14 months ago. Besides *prestamanos* and *mingas*, 11 farmers reported that they have hired outside workers within the past year. Workers from the nearby indigenous community of Charap (Shuar) and from colonist communities were paid about $4 per day for sowing and weeding large areas of pasture for cattle, and less frequently for clearing and cutting trees. One hired hand cutting timber into boards was paid $9 per day. The use of outside labor has been increasing in the last five years. Although the origin of these workers has not changed in general, one man reports that before he hired Quichua workers but now hires Shuar.

An relatively new economic activity for these Secoya is raising domestic animals. With the exception of two families, everyone has cattle now, varying from two to 14 head, the mean being five. Cattle are solely for market, as no one eats them, but in the previous year only a few families had sold any, from one to three cows. Besides cattle, six households have horses (an average of 1.6 in these six), one has two pigs, and everyone has chickens, from 4 to 60, averaging 24. Pigs and chickens are mostly for household consumption but also are sold. People report that they have sold from one to over 100 chickens and up to ten pigs in the last year. No one reported an intra-community exchange of domestic animals. Opinions about changes in the number of domestic animals being raised over the last 10 years are divided; a majority said that this has been increasing, but others said that they now have fewer domestic animals than before.

Regarding property, as explained above, each male head of household has a farm of 100 hectares, which is individually held and can be bequeathed to children or grandchildren. Some specifically said that they will divide it between sons and daughters, some that they will give land only to their sons, and others did not specify. One man said that he will look for *jornaleros* who can work for him so he could still manage the farm. As far as distributions of land that have already occurred, some households have already given land to close relatives to work: one man to his nephew, another to his brother, and a third to his grandchildren.

Inter-generational differences exist in terms of agricultural patterns, with most feeling that young people tend to work less hard and are more concerned about acquiring possessions. The younger people agree that they work less, though they spend more time on their education. But one drawback of this is that young people are not familiar with the land and losing their appreciation of it. Older people think of their plots as a key part of life, but the young disagree. When the young people do think of the land, instead of thinking of *chacras* with manioc gardens, they think of farms with cattle.

Secoya Resource Use and Conservation

This section summarizes the management and use of forest and riverine resources. Patterns of hunting, fishing, gathering, game taboos and use of timber and non-timber products are described. We conclude with a discussion of Secoya perceptions of resource scarcity and attitudes towards conservation.

For Secoya males, the first hunting experience is at age 6 to 15. All of the present adults were taught to hunt by their fathers except one by his grandfather. The most common hunting tool nowadays is a shotgun or rifle, obtained by informants at age 8 to 22 as gifts from older male relatives (the oldest is a colonist who got his gun from his indigenous brother-in-law). Despite the fact that Secoya hunters no longer use traditional hunting tools, 11 of the 16 respondents say they were given a blowgun between age 6 and 18, and three received bows and arrows and one a spear from their fathers when young. The oldest Secoya hunters are still familiar with the use of these traditional procurement technologies for hunting. Half of the informants use traps, made with heavy poles or tree trunks to smash animals. Traps are put on animal trails or in salt licks, and are useful for hunting armadillos, paca, agouti, acouchy, and Cracid birds.

The Secoya prefer to hunt alone, but nevertheless 12 of 16 say that their wives sometimes accompany them, bringing *chicha* or *chucula* and cleaning and transporting game. Beginning at age 6, their children, usually boys but sometimes girls, also often accompany them. A group hunt is organized upon the sighting of peccaries or other large mammals, and is also formed when hunters have killed a large mammal (such as a capybara or tapir) and need help transporting it. Whoever invites others to hunt in a group is considered to be in charge of the event and the distribution of the prey. The game from a successful hunt is divided equally among those in the group. Close kin are usually the ones involved in hunting groups.

Besides human hunting companions, dogs are often brought along during hunts, and are considered useful for hunting armadillos, peccaries, rodents, and other large animals. Most hunters have one to three dogs for this purpose (only 3 of 16 respondents do not use dogs). To make dogs good hunters, the Secoya feed them with the larvae of *conga* ants and wasps to make these insects bite the dogs. Except for one hunter, who has never gone on a nocturnal hunting trip, night expeditions are

common; people hunt at night with flashlights and firearms, seeking to kill armadillo and *paca*. Overall, hunters report being successful 7 to 9 times out of every 10 hunting expeditions.

We recorded 40 hunts for the residents of the village of Sewaya, encompassing 73 animal encounters, of which 69 encounters have capture data, and animals caught on 42 encounters. This gives a kill versus encounter ratio of 0.61. Of 54 encounters for which we have procurement technology data, 43 (80%) involved the use of a firearm. Of this small sample size of animals caught, we found that the agouti (*Dasyprocta* sp., n=6) was the most commonly captured prey type, followed by turtles (n=5), White-lipped peccary (*Tayassu pecari*, n=4), Collared peccary (*Tayassu tajacu*, n=3), armadillo (*Dasypus* sp., n=3), acouchy (*Myoprocta* sp., n=3), tinamous (Family Tinamidae, n=3). Overall, mammals represent 62% of kills, reptiles 17%, and birds 12%.

In addition to accompanying their husbands on hunting expeditions, many Secoya women also hunt on their own. Of the 16 women who responded, seven hunt. With the exception of one woman who uses a stick, the others use shotguns, just as the men do. This hunting may take place in their gardens or in the forest. As with the men, women hunters enjoy hunting alone, but sometimes with dogs and accompanied by children. Women hunt less often than men, from once per week to once per month, and reported being successful around eight tries out of ten.

Hunting frequencies have declined over time. The 16 informants in this sample used to hunt a median frequency of once a week, but now go only once every two weeks. Not only do most men hunt less often, but they also hunt for less time. From a median duration of 12 hours per hunting excursion (some multi-day hunts), now the median is 5 hours. In terms of distance, some remain closer to the community now, two to four km versus four to eight km ten years ago. But there are some instances in which this walking distance has increased: some people now go deeper into the forest but less often. The median hunt distance has increased from 3.5 km to 6 km. Moreover, men said that they all used to go on multiple day hunts, but now most (10 of 16) do not. The other six still go for 2 or 3 days once every month or once every 3 to 4 months.

Many hunting trails exist in the community. Most use a trail by a small river (Cocaya) in their territory, two men use only trails on their own *fincas*, and one uses trails on the other side of the Aguarico River. Only the latter is inside the Cuyabeno reserve, but is still Secoya territory.

Peccary, paca, tapir, agouti, monkeys and Cracid birds are considered the most desirable game animals to eat. However, some of these used to be considered taboo. The Secoya never used to eat a number of animals that they now eat, including deer, coati mundi, currasow, capybara, tortoise, paca, squirrel, and Howler monkey. Only 4 of 16 respondents reported eating the same animals now as in the past. Some animals, however, are largely still avoided, such as anteaters, jaguars, black vultures, nocturnal birds, and tapirs, either because of the taboos or because they are thought to smell bad. It is

noteworthy that during both the period of training to become a shaman, and prior to the *ayahuasca* (hallucinogenic) ritual, people are supposed to follow strict food taboos, for instance not eating too much game, salt or sugar. Since the practice of this ritual is diminishing, these taboos are also disappearing.

All the Secoya said that they like to fish. They begin when they are about six years old. Men and women both said that they prefer to fish alone rather than in a group as it is less noisy, but in fact they frequently go with a partner, usually another member of the household. Fishing in groups is common in the dry season, when the low water levels concentrate the fish and make *barbasco* poison more effective. The person who invites the others is considered the organizer of the fishing expedition and provides the *barbasco*. Another common fishing technique is to use hook and line, which is popular among Sewaya residents, and was used also by their parents and grandparents. In contrast, fishing with a harpoon is said to be the most difficult method, used only by men, and a method done by informants' fathers and grandfathers. Of the 16 informants, three use the harpoon, generally during the dry season when the Aguarico river and feeder streams are low. Although difficult, the harpoon is inexpensive and can yield a good catch, 25 to 75 fish. Finally, three men sometimes use a net, which was not used by the previous generation. To use a net, two or more people put the net in the river or stream, for between several hours to a whole night, yielding on a good day up to 30 fish. Half said they are always successful when they fish, the other half reported being successful on seven of ten trips.

Respondents are divided about whether they prefer to fish or hunt: six of 16 prefer to hunt because they prefer to eat meat and "it is easier to hunt than to fish." However, five prefer to fish because is easier and they have more fun, and another five have no preference. In general, preferences are linked to what they prefer to eat.

As with hunting, the frequency of fishing has slightly declined. Most used to fish everyday to once per week (median twice a week), but the frequency has declined so that no one is fishing daily and some go only twice per month (median once a week). The duration of fishing time has not changed, and is a median period of 3 hours per trip. Of course, the decline in fishing frequency is also linked to eating fish less frequently than in the past, although a few families some still eat fish almost every day.

Moving on to floral resources, products from the forest are also utilized extensively, especially wood extraction and sale: 9 of 16 (56%) informants reported selling wood, namely *cedro, laurel, guayacan, chuncho, amarillo, sangre de gallina, manzano* and *canelo,* in the form of logs or *tablones* (sold for $0.10 to $0.40 per *tablón*) to a middleman on the Aguarico river or in neighboring *colono* communities. They receive much more, $0.8 to $1 per plank, if they can get the planks upstream in the Poza Honda market. Cedar*, amarillo* and *chuncho* are also good for making canoes, so there is market as well as domestic use pressure on these species. Other less desirable and marketable trees such as *manzano, guambula, capirona, pambil, chuncho and zapotillo* are used to build their own houses. Wood

is taken from their own 100-hectare allotments, with 10% of the market sale going to the community. While they are not aware of any clear regulations about the cutting and use of timber, a community leader mentioned that after a certain (unspecified) amount is harvested, people must request permission to harvest more for sale during the community assembly meeting.

Non-timber forest products are collected for food, medicine, firewood, construction and manufacturing. Three-fourths (12 of 16) of the respondents said that they gather fruit to eat such as *guabas, zapote, morete, ungurahua,* forest cacao, forest grapes, peach palm and *majaro* during the summer or dry season (September through February or March), and during May. Seeds and *chambira, jije* and *jaipa* fibers are used to make *shigras*, baskets, hammocks, fans, and strainers for both household use and sale. Along with medicinal plants, these are collected all year long. From the 410 household/days recorded in the input/output diary, the Secoya collected 14 non-edible products: 10 plants, one animal product, and three unidentified products. Seven of these products were used for firewood and two each for handcrafts and construction. There are no regulations about the methods of collection or amount of non-timber forest products that can be collected. Like other indigenous Amazonian groups, the Secoya have a detailed knowledge of and techniques for harvesting fruits and other products even from tall or spiny trees, but they also use the ax and chainsaw to fell trees to obtain products.

The Secoya unanimously perceive forest resources to be increasingly scarce. All agreed that just 10 years ago they enjoyed an abundance of tree species, such as *cedro, ahuano, guayacan, balsamo, amarillo,* and *caoba,* all of which currently are on the way to local extinction. They complained that now they need to go further into the forest to find timber and non-timber products. Although they know that these species are disappearing, few plant any trees: only one said that he had planted *caoba, cedro and laurel,* and two others planted a few fruit trees for firewood as well as food.

We asked them about the abundance of game and fish. Almost everyone said that there was an abundance when they first arrived at the community, but most (14 of 16) said that the animal population has declined and game is no longer plentiful. However, informants generally do not attribute the scarcity to their own activities—just two said that Secoya hunting is causing the depletion. Instead they attribute it to colonists' hunting in their territory or to the presence of petroleum companies, whose actions scare away game and destroy food resources and habitat. Animals such as tapir, peccary, paca, anteater, armadillo, woolly monkey, and birds such as *pangui, montete* and trumpeters are now difficult to find. Similarly, 12 respondents feel that there are fewer fish in the river now, due to pollution and over harvesting, but three think the fish stocks are the same as compared to 10 years ago. But everyone said there are fewer fish now than 25 years ago, when the rivers were full of fish. The most abundant fish are *bocachico, bagre, barbudo, sabaleta, palometa, pintadillo, paco, pirana, sardine, cachama, lisa,* dog fish

and mouse fish; of these species, the most prized to eat are sardines*, barbudo, paco, bocachico, bagre, lisa, palometa* and *sabaleta*.

While they say that there are no restrictions or rules about the use of the river, the animals or the forest, only three said that they do nothing to maintain game populations; the majority said that they try to protect animals and avoid over-hunting and polluting. One person noted a community rule to preserve 80 hectares of forest out of 100 allocated to each household, and another person stated that "this is a reserve" and they should protect it. An agreement exists with the Ministry of Environment, which requires that they protect the area in the back of their *fincas* (away from the river), which is to be used for ecotourism, scientific research and forest preservation. The territory of Sewaya on the north side of the Aguarico River is all in the Cuyabeno Wildlife Reserve. (Detailed information about the rules of land use and zoning of the Secoya territory are found in De La Torre *et al.* 2000.) Since the Secoya view the forest as a source of food, shelter, and income, on a pragmatic level they know that they should avoid putting these resources at risk. When asked about their roles in nature, one person said, "To live and use the forest, to hunt and fish in the river." Another added, "Between people, the forest, the animals, the air and the rivers, there is a direct and dependent relationship. People should take care of the forest, not cut trees, not throw trash in the river or contaminate so that animals can live and serve as food for people." A few mentioned cultural prohibitions about exploiting resources, and spirits and ancestors that live in the forest: "[we] do not fell the forests because there are spirits of nature that live there," and "in the forest there are sacred places where special living beings reside."

When we asked them about their ideas of what constitutes a "healthy forest," everyone replied that it is a place where there are many animals, birds and trees; it is quiet and unpolluted. They see the advantages of a healthy forest as a source of clean air and for ecotourism, but some cited disadvantages of having to limit their hunting and timber extraction. When asked about "conservation," half said that they do not know what the concept means, while the others defined it as the way to keep a healthy forest and life, to preserve their culture, and to steward a reserve for their children. Conservation is also seen by the latter group as preserving and maintaining the forest as a place to live without contamination, a source of food, animals, and timber for firewood

Though many spoke about the decline of game and fish populations, timber and non-timber products, a quarter are still optimistic about the environment for the next generation, saying that their children will preserve the forest and Secoya culture and traditions, and will enjoy the same resources and good standard of living. But the vast majority, 12 of the 16, is pessimistic, thinking that their children will not enjoy the same resources because the forest will be over-exploited and might even disappear due to the activities of timber and petroleum companies. These views are echoed when we asked about perceptions of scarcity of arable land. Most residents feel that in the short term, there is enough land for

everyone. Since each household has a *finca* of 100 hectares, they believe this is enough for all of their children. Additionally, one couple noted that there is a large reserve of land that is communally held which could be utilized for agriculture. However, most agree that the entire forest is at risk of becoming over-cultivated, that future generations will need to use land held in reserve, establishing settlements further and further into the forest. Thus in the long run, the land base is seen as insufficient. Many think that people will become increasingly dependent on jobs outside the community.

Secoya Perceptions of Outsiders and Aspirations for the Future

This section describes the types of outsiders with whom the Secoya have contact, the activities of these outsiders, and Secoya feelings about them. It concludes with Secoya aspirations regarding consumption and the future of their families and their children.

Since the advent of petroleum exploration by the Occidental Petroleum, the people of Sewaya have experienced the effects of oil exploitation first-hand. After an agreement was signed between Occidental and this community, with mediation of the national Secoya federation OISE, there has been a daily presence of oil workers somewhere on Sewaya lands, and most Secoya men have worked for Occidental at some time in the past five years, though less in 2001 during the ethnographic study. As mentioned above, oil companies are seen as causing deleterious effects on the natural environment, such as water pollution, which kills fish, and noise pollution, which causes animals to flee. Nevertheless, upon reaching agreement with Occidental, households in the community received goods such as radios and medicines, and the community received support for projects, such as construction of wells, a medical center, and a fishpond. Their feelings towards the company have changed over time, such that now most Sewaya residents see the oil company as a source of support and like the help they receive.

Many non-governmental organizations and foundations have also visited this community. At the time of this study in the first half of 2001, workshops and technical support about agriculture and fish farming was received from groups such as Ñanpaz (itself mainly funded by another oil company) and Ibis. Residents generally feel positively about these groups due to the tangible benefits they receive. In addition, many researchers (e.g., journalists, sociologists, anthropologists, and biologists) have visited Sewaya. The Secoya see many of these people as only coming to extract their knowledge in exchange for nothing. As with some other indigenous communities, some Sewaya residents express hostility to these researchers and do not understand the reasons behind all the questions they ask. Less frequently, lawyers from government agencies have given workshops and technical support (e.g. PRODEPINE, *Proyecto de Desarrollo de los Pueblos Indígenas y Negros del Ecuador*). Though they like this support, they expressed a fear of being cheated. "I'm happy, I like it, but I hope that they help and have not come to deceive us," said one. Moreover, many tourist companies have given different types of tours in the

community, so many tourists have made short visits to Sewaya. People said that they like tourists because they represent a source of labor and income: "when tourists come, I like it because I can sell something," and "with tourists there is employment." Finally, they mentioned their less frequent contact with missionaries who visit them to give medical help, through medicines and courses for health promoters. Surprisingly, few mentioned contacts with their colonist neighbors, with whom they have far more contact than with the other groups listed. They sell agricultural products, domestic animals and timber to colonists, and purchase food and other goods from them weekly or semi-weekly. They also visit and are visited by neighbors and kin of other indigenous groups along the Aguarico River, especially during festivals and sports competitions, and a few Shuar neighbors work on Secoya farms as well.

Due to the contacts they have with outsiders, the Sewaya residents can see that outsiders are different from them in eating and dressing habits, culture, language, and even housing. Some think that outsiders have "bad habits" and those who are living in the cities are "dangerous." However, the Secoya would still like outsiders to provide support for the community, from agricultural resources, livestock (cattle) raising, technology, electricity, tools, and credit, to better internal organizational support such as more *mingas* in the community. They expressed a need for potable water, agricultural extension, and medical care, and also communal and personal goods such as an outboard motor, more cows, pasture, houses, latrines, a communal house, solar panels, and medicines. Several said that they would like to have increased access to loans to invest in farm projects.

People were asked about their idea of "development." Few are familiar with the concept. Some defined it as the means to get property, goods and services through working and earning money, which for them is often linked to cattle ranching. For others, development means buying new houses and furniture, and getting services such as electricity, potable water, plumbing, and medical care. As development is generally associated with buying power and consumption of goods, transportation infrastructure facilitating access to markets is seen as an important component. Secoya residents were asked about the benefits or disadvantages of roads. They see access to roads and markets as making it easier to get outside the community to commercialize products and acquire goods, as well as facilitating access to schools and education. But on the other hand, they realize that roads bring danger, thieves, oil companies and colonists, followed by contamination and scarcity of game.

They were asked if it is possible to live without money. As 12 of the 16 respondents grew up having some monetary income, most think it is not possible to live without money, as it is necessary to pay for services and buy goods and medicine. But a minority said that although life would be harder, they could live without money. Interestingly, the vast majority of Secoya residents said that even if they had a lot of money, they would still prefer to live in the forest, with only one person saying he likes to be away from the community to visit the city or town. Towns and cities are seen as useful to visit for shopping,

communication, trying different foods, and visiting parks and friends, but have the disadvantages of traffic, murders, theft, pollution, boredom, and bad weather (too hot in Lago Agrio, too cold on Quito). Thus almost all prefer to remain in the community, because it is peaceful, there are animals to hunt and fish, and there is land to work. Even compared with other places where some of them were living before, everyone enjoys living more in Sewaya now, with the exception of two elders who said the places where they were living before were much better because there was a higher abundance of game and fish.

When asked about their consumption aspirations, such as what they would they like to eat more of, most Sewaya residents said game, fish and *casave*—all part of the Secoya traditional diet—followed by purchased foods such as rice, onions, sugar, tuna, cookies, noodles, salt, oil, tomatoes, milk, and eggs. For personal consumption they would like to buy a variety of things, such as clothes, shoes, cell phones, ammunition, firearms, and even perfume and makeup. For their household, they would like furniture, dishes, appliances, mattresses, generators, audio systems, paint, stove and ovens, pots and pans, and outboard motors. For their children, they mentioned clothes, shoes and school supplies.

Looking to the future, what are parents' aspirations for their children in terms of an education and a profession? Half (8 of 16) of the men said that they want their children to finish high school, two said the university, while the others would be satisfied with completion of primary school (2 of 16, with four giving no opinion). For the majority, education is seen as a means by which their children can learn, get a good job, and live better. However, everyone also hopes that after their sons finish studying, they will return to the community, where they can help in agricultural tasks, ecotourism, and federation affairs. Two of 16 want their daughters to study so they can then work as a secretary or nurse in the community. The rest are divided in their enthusiasm for educating girls; some feel that girls should stay in the community to help their mothers, raise domestic animals, work in tourism, and eventually get married and take care of their new family.

Most believe that young people who receive a formal education should return to the community. They definitely want both their sons and daughters to live in the community, or at least nearby in the northern Amazon region (i.e., their daughters once they get married). According to informants, few young people envision going to the city to work or remaining permanently in Coca, Puyo, Lago Agrio or Quito.

SUMMARY AND CONCLUSIONS

In an effort to understand patterns of land use and land cover change among indigenous populations in northeastern Ecuador, this research project has used a variety of quantitative and qualitative methods from anthropology, as well as demography and geography. It is important to understand how different indigenous populations respond to external forces, such as oil development, tourism, and cash cropping opportunities, and how these responses are linked to population, cultural values, access to infrastructure, and ecological characteristics. In this monograph, we have focused on summarizing the results of the ethnographic data that were collected by ethnographers who lived and worked for five intensive months in indigenous communities. What emerges is the following message: it is critical to take culture into account when trying to understand how people use land and resources. Even with a sample of only eight communities representing five different ethnic groups, we observe important inter-cultural variations that fly in the face of common assumptions that indigenous Amazonian populations are essentially homogeneous.

Demographics

Demographic findings indicate a series of important commonalities and differences among the indigenous study populations. First, all are experiencing rapid population growth, with all groups except the Secoya having over half of their populations under age 15 (for the Secoya, it is still 45%). Age at first union or marriage is very young, close to 15 for most girls. The populations of the five ethnicities are all natural fertility populations, with virtually no use of contraceptives except plants (the effectiveness of which remains to be investigated). The lack of contraceptive use contrasts with the apparent common desire of women to not have more children. Fertility is surely high, but quantitative data are insufficient in these communities to provide meaningful estimates. Breastfeeding is virtually universal, often for a year or more. Women generally perceive breastfeeding to be beneficial to the infant; however it will be important to keep an eye on the replacement of these practices for bottle feeding, perceived to be more "modern," which would have implications for inter-birth intervals. Not only are more data are needed on fertility, but our understanding of mortality is also very limited. It appears that in all ethnic groups black magic or sorcery is often implicated when people die, both as a proximate or ultimate cause. Better mortality data will enable us to better predict future demographic patterns, as well as inform efforts to improve medical care and standards of living. In terms of social organization, families in all communities live in nucleated villages surrounding a school and sometimes a landing strip or river pier; all have a similar leadership structure, and all are associated with their appropriate indigenous federation. All communities feel the impact of governmental neglect of the Amazon region, as none has electricity

(although some families have generators and a couple communities have solar panels for the school or community center, obtained from oil companies) or potable water systems.

Despite many demographic commonalities, we find differences in terms of language and education that reflect the varying histories of contact among these groups. The Shuar and Quichua have long histories of contact with the larger Ecuadorian society, and one way this is reflected is in their linguistic patterns: there are no monolingual Quichua or Shuar speakers among the participants in the ethnographic study. Most are bilingual with the indigenous language and Spanish, with a few only speaking Spanish. Among the Secoya, about 5% are monolingual in *Pai Coca*, and the rest speak that and Spanish, with some speaking other indigenous languages as well. Among the Cofán, 19% are monolingual A'i speakers, 75% are bilingual with Spanish, and 6% also speak other indigenous languages. The Huaorani are 20% monolingual *Huao tededo* speakers, 80% bilingual with rudimentary Spanish. Another way this gamut is illustrated is in terms of formal education: although all these populations are similar in that they all have limited education mostly centered around primary school, just about all of the Quichua and Shuar have had some schooling, whereas 14% of the Cofán and 20% of both the Secoya and Huaorani have had no formal schooling at all. Although roughly half of the Quichua, Shuar and Huaorani finish primary school, 37% of the Secoya and 75% of the Cofán did not make it to the end of sixth grade.

Agricultural Production and Resource Use

In terms of agriculture, all groups plant manioc, and *Musa* species (plantain, bananas, *oritos*) for subsistence. For the Huaorani, as they do not focus on cash cropping, there are no other primary crops, whereas the Cofán also grow corn. The Quichua grow coffee and corn to sell, the Shuar focus on coffee production, and the Secoya grow coffee, cacao, corn and pasture. It is this crop production for market that has led all these groups to use small amounts of external inputs such as pesticides or herbicides, whereas this not done among the Cofán and Huaorani. For the Quichua, Shuar, and Secoya, about half the agricultural plots are monocropped, whereas most of the Cofán and Huaorani plots are polycropped with a variety of secondary cultivars. Hence the latter two groups emphasize the continued importance and usefulness of plots post-active cultivation, where they garden hunt and continue to collect fruits and grubs. In terms of fallow practices, the Quichua fallow for a median of 2.5 years, while Shuar who plant coffee or pasture in areas first used for subsistence crops do not fallow. The Secoya and Huaorani fallow for a median time of eight and four years, respectively (fallow data was given on only 6 of 50 total Cofán gardens; it is unclear if people understood the question). When producing crops for market, having enough labor becomes very important. For the Shuar, Quichua and Secoya, using *mingas*, *prestamanos* and hiring outside laborers are all common practices, whereas for the Huaorani, for instance, there is some use of *prestamanos* but very little calling of *mingas* between households. In terms of domestic

animals, the Quichua and Secoya surveyed have chickens, pigs, horses, and cows, while the Shuar have those animals plus some guinea pigs, ducks, and a mule. Both the Huaorani and Cofán raise chickens and ducks only—no cows, pigs or horses were present at the time of the study. The Cofán spoke of the controversy that ensued when someone tried to bring a horse into the community, and the Huaorani have said that they do not have horses because they are not "*finqueros*."

One of the quintessential characteristics of indigenous peoples is their reliance on the natural environment, an assertion that finds confirmation in our research, but to varying extents. On the one hand, the Shuar studied live a life that is similar to non-indigenous colonists in the Amazon, while the Huaorani live in a way that still somewhat reminiscent of patterns before sustained contact with the outside. An example of this is demonstrated in terms of reliance on forest game as a source of protein in the diet. Dietary intake data showed that only 30% of the days recorded by Shuar households witnessed the consumption of hunted game, while for the Quichua it was 39%, followed by the Secoya by 43%. For the Cofán, on average, forest meat is consumed almost half of the days (48%), and for the Huaorani it is about 70%. For fish, the pattern does not hold as well, as the Quichua eat the most fish (57% of days surveyed), followed by the Huaorani (51%), Secoya (47%), Cofán (44%) and lastly the Shuar at 40%. Although all these communities purchase part of their food, they vary in terms of their perceptions of what constitutes acceptable origins of that sustenance. In general, the Quichua informants said that if they had the money, they would buy all of their food, giving up hunting and fishing. Half of the Shuar followed suit, with half saying that they would still fish. But the Cofán and Secoya insisted that they would still eat foods from the forest and rivers, while many Huaorani respondents said that they "always have to hunt and fish," viewing these activities as central to who they are.

As a result of the post-hunt interviews conducted during this study, some insights can be drawn about the relationship of indigenous hunters and faunal populations, a subject of recent debate among ecologists and anthropologists (e.g., Redford 1991, 1992; Redford & Stearman 1993; *Conservation Biology* Forum volume 14, number 5, 2002). Ethnographers were trained to follow up on all hunting expeditions in their field sites, so over five months, the quantity of interviews we have is a rough proxy of hunting frequencies in various villages. What we find is a strong hunting orientation among the Cofán, with the largest number of hunts recorded in a community (n=120). (Note that as mentioned in the Cofán section, during the time of the study tourism levels had dramatically declined, which is likely to have elevated rates of hunting). The Huaorani are next with 84 hunts divided between two communities (n=59 in Huentaro, n=25 in Quehueiri-ono). The Quichua in terms of hunts per community are in the same range as the Huaorani, with 110 hunts represented (n=45 and 46 in the Sucumbios Province communities and n=19 in Pilchi). The Secoya community of Sewaya has 40 hunts, but the Shuar community of Tiguano has the least hunting orientation, with only 10 hunts recorded (note that the most thorough and

adept ethnographers were placed in Tiguano, so this low number was not due to lapses in data collection). The ratio of the number of animal encounters by the number of hunting expeditions gives a rough measure of the abundance of faunal resources in various communities (and to a lesser extent, the hunting prowess of residents). This ratio is lowest for the Quichua at 1.4, followed by the Secoya at 1.8. The Shuar are next, with 2.1, but here we have the problem with small sample size. There is a large jump then to the Cofán with a ratio of 4.1 and the Huaorani at 4.8. These last two groups ostensibly have a combination of a hunting orientation, hunting prowess, and a rich faunal land base. The Quichua and Secoya, as evidenced by their responses for their favorite foods, value hunted game, and they are trying to meet these consumption desires in a territory increasingly limited in game and subject to external pressures.

Besides the encounter rates of game per hunt, the composition of prey types captured is an indicator of local forest biodiversity. Because primates and Cracid birds have low reproductive rates, are large-bodied members of their taxa, and are perceived as desirable, they are some of the first species to be locally depleted in the face of hunting pressure. On the other end of the spectrum, rodents and ungulates have higher rates of reproduction and tend to be less vulnerable to over-exploitation. So we would expect to find few primates and Cracid birds among the Quichua, Secoya and Shuar, and more primates and Cracid birds among the Huaorani and Cofán given their richer land base and lower population density. For the Quichua and Secoya, this was what we found, with agoutis, pacas, acouchies and peccaries as the top prey types captured by frequency. For the Shuar, the sample size is very small, but peccaries, acouchies, and squirrels top the list. For the Huaorani and Cofán, these prey types are also prominent, but Woolly monkeys and Cracid birds are some of the most commonly killed animals, ranked first and second for the Huaorani and second and fourth for the Cofán.

When we compare the median values for hunting and fishing patterns among the eight villages, we find that median hunting frequencies (hunting trips per week) have declined for six of the eight communities, with no change in Pachakutik and an increase in Huentaro. A strong pattern was also found among hunting distance, the number of kilometers hunters walk in search for game. In six of the eight villages, residents reported having to walk farther now than in the past; only in Pastaza Central was there a slight decline (median of 4km to 3km), and in Huentaro there was no change. The duration of hunts does not present a consistent picture, with increases in median hours per hunting trip increasing in four communities, declining in three, and not changing in one. For fishing, there were no consistent changes in median frequency or duration of fishing trips, with often the same patterns holding over time.

In terms of gathered forest products, we found a gamut in the number of items different communities collected. The Quichua report 209 non-edible products collected, the Huaorani 131, the Shuar 73, the Cofán 65, and the Secoya 14. The continued reliance on forest resources for medicines,

construction material, handicraft production, domestic items, and fuel represents a wealth of ecological knowledge, a subsidy from nature which helps mitigate against market fluctuations, and a concrete link between people and the natural environment. The ability of these indigenous groups to maintain control of a rich resource base is a crucial determinant of the degree to which they can maintain economic self-sufficiency, political autonomy, and cultural distinctiveness.

Household Economics

Another similarity of all the groups studied is that none is a purely subsistence economy—all communities are involved in the market to some degree and purchase things such as clothing and food. However, within these mixed economies lies a diverse range of degrees of market integration. The types of income-generating activities done differ between these groups (See Table 9). Although all of the indigenous men have oil work in common (given the prevalence of oil exploitation in this region), and those who are lucky enough to live nearby to a tourist destination work in this arena (especially Quichua in Pilchi and Zábalo Cofán), neither Quichua nor Shuar men tend to sell game, live animals, nor handicrafts whereas Huaorani men focus on these activities. Alternately, the Huaorani do not sell cash crops while the Quichua and Shuar live by selling coffee and corn. The Cofán in Zábalo rely on tourism, and do not sell game, timber, or crops; the Secoya are increasingly focused on cattle raising as well as cash cropping. Shuar, Quichua, and Secoya women sell domestic animals, Cofán women somewhat engage in this activity, and Huaorani women raise domestic animals just for subsistence. Quichua and Shuar women also do not make handicrafts, unlike the other three groups. In half of the study communities the sale of timber is negligible, whereas in Pilchi, Quehueiri-ono, Tiguano, and Sewaya some households sell timber.

Table 9: Important Economic Activities by Indigenous Group

	Shuar	Quichua	Cofán	Secoya	Huaorani
Petroleum Companies	X	X		X	X
Cash Cropping	X	X		X	
Tourism		(few)	X	(few)	(few)
Sale of Handicrafts			X	(few)	X
Sale of Forest Game					X
Domestic Animals	X	(few)		X	
Timber Sales	(some)	(some)		X	(few)

These characterizations of cross-cultural household economic patterns are, of course, not written in stone. As opportunities wane and others emerge, we can expect repertoire of economic activities in various communities to adjust accordingly. What appears to be more consistent, however, is the tendency for people to undertake economic activities which complement household economic patterns, maintain flexibility in adapting to unforeseen changes, and minimize the chance of shortfall. For example, the Huaorani's increasing market focus of activities such as hunting and craft-making are a good example of a way in which people readjust and intensify traditional activities to suit new needs and desires. Ecuador's Native Amazonian populations, like indigenous peoples elsewhere in the world, are not averse to trying new methods of earning income, diversifying existing wage labor or agricultural patterns, or taking advantage of new economic opportunities. This appears to be an obvious statement, yet notions that Amerindians are somehow static remain prevalent, and cases of outsiders becoming disillusioned by indigenous people working for the petroleum industry or selling timber are common in the literature (Conklin & Graham 1995). The possibilities for groups like the Cofán, Secoya and Shuar to meet growing needs in a rapidly changing economic, socio-political and ecological context depends on many factors, including the influence of supra-local forces like government policies and extractive industry activities, but also on peoples' desires and aspirations.

Attitudes and Values

The formal ethnographic interviews contained a wealth of aspirations, opinions, and perceptions, and here we will summarize and comment on some patterns which emerged, specifically having to do with market contact, urbanization, and development. People were asked what they would like to consume more of, and what they would like to be able to buy. The Cofán and Secoya in general said that they wanted to consume more forest foods such as fish and game, and then secondarily would like to consume store-bought foods (e.g., sugar, tuna, cookies, lard, noodles, and sardines). The mostly female Huaorani respondents mentioned wanting to eat more fish, vegetables, and purchased foods, perhaps because of the relatively plentiful amount of forest game they have regularly. In contrast, the Quichua clearly expressed their desire to have more protein in their diet, but specifically mentioned that they wanted to eat less monkey meat, perhaps a reflection of that social stigma attached to that particular food. (This was found among residents of Quichua villages as well as among Quichua residents in Huaorani villages.) Lastly, the Shuar replied that they wanted to eat more food in general, and those who answered the question of what they wanted to eat less of said that they would like less store bought foods and rice. Clearly, the desire for dietary diversity is reflected in these responses, but also some notions of food biases and perceptions of acceptability. Tremendous uniformity was found when people where asked what they would like to be able to buy for the home, themselves and their children. For the former, pragmatic

considerations were foremost: they wanted pots, ammunition, machetes, stoves, sewing machines and outboard motors. More luxury items included radios, generators and televisions. Personal items included clothing and shoes, occasional references to jewelry like watches, cosmetics for women, and school supplies and toys for the children. Further research is needed on people's perceptions of these manufactured items, such as the degree to which they are viewed as necessities or luxuries, as tools facilitating tasks or symbols of wealth and status.

The foil to inquiries about consumption aspirations is the question of whether informants felt they could live outside a market economy; in other words, if the forest and local ecosystem was perceived as being enough to sustain them. To ascertain sentiments about the forest, we asked whether, if they could afford it, they would move away from the *campo* and go to live in the city. Clearly, there was much individual variation in responses, but some overall trends were seen. For the Quichua, the vast majority believed that they cannot survive without money, and most would live in the city if they could afford it. The Shuar also believed that money was critical to survival, but interestingly, most said that they would not move to the city if they could afford it. Among the Secoya, one-quarter believed that they could survive without money, but most said they would move to the city if they were economically able. The Cofán mirrored Secoya responses for the former question, but said that they would not live in the city. Lastly, the majority of the Huaorani believed that life outside a market economy is possible, and the majority would not leave their forest home. In an increasingly market-oriented society, the notion that people could withdraw from the market economy and subsist is striking, and it is not surprising that the ethnic groups with relatively short histories of sustained outside contact and a relatively intact land base tend to be the ones voicing such an opinion. Furthermore, the data points to a possible inverse U-shaped relationship between degree of assimilation into the larger society and desire to live in an urban environment: groups with high and low degrees of integration are hesitant to live in a city even if money were not an issue, whereas perhaps the intermediate groups are more likely to see that as attractive. None of the groups had an overly idealized view of the urban environment, however. All mentioned the fact that cities can be dangerous, dirty, corrupt, expensive, noisy and violent.

Besides questions ascertaining opinions about informants' present consumption and lifestyle preferences, we asked study participants about their hopes for the next generation. Again, there was both overlap and divergence in responses. People from all these indigenous populations value the benefits formal education can provide for their children. Though the adults responding often have little or no formal schooling themselves, all want their children to finish primary school, so that they have basic Spanish, mathematical, and reading skills. Many assert that their children should go on to secondary school, or *colegio*, and a few even mentioned a university education. A male bias in responses to this

question was seen among all ethnic groups, with education aspirations higher for sons, and more emphasis on daughters settling down and having a family.

Tension arises, however, between wanting young people to be *capacitados* (trained, educated) and having more facility in dealing with the larger Ecuadorian society, and not wanting the next generation to lose a sense of indigenous identity. When asked about what they think the lifestyle of the next generation will be like, those groups with access to larger territories (i.e., Cofán and Huaorani) are optimistic that there will be sufficient natural resources and land for their children, in contrast to the ecologically pessimistic predictions of the Quichua. Cutting across the responses of various groups are concerns that the youth will think and live like colonists and outsiders, stop speaking indigenous languages, no longer live in the forest. People worry that their culture will "disappear." One clear message in these conversations emerged: no matter how integrated people may be into the market, regardless of how much they may positively perceive "development," and despite whatever fondness they may have to manufactured goods, urban environments and store-bought foods, there is still a profound sense of value and pride in being Huaorani, Cofán, Quichua, Secoya and Shuar, and a realization that they are fighting a battle for cultural survival.

Looking to the Future

This document is a first step in trying to understand the processes of cultural, ecological, and economic change in northeastern Ecuador. It seeks to provide an ethnographic context for subsequent analyses and publications arising from the research project, the lens through which the quantitative and spatial data are interpreted and become meaningful. The datasets generated from this project represent an ambitious effort involving dozens of individuals both in the US and Ecuador to obtain a regional understanding of human/environment dynamics. While the cross-cultural nature and spatial scale of the data collection are noteworthy in terms of previous Amazonian studies, longitudinal data are needed to more fully address the complex and dynamic linkages between human and ecological systems. Moreover, detailed studies of floral and faunal diversity, abundance, and distribution are necessary, as well as information on health status of Amazonian residents. Without these, we have little basis on which to gauge the impacts of forces such as market integration and petroleum exploitation. The accelerating pace of market integration, globalization, and cultural change affords us only a short window to be able to investigate and document this process. As Godoy (2001: 5) points out, "once relatively isolated indigenous people modernize, researchers forever forfeit their chance to record information and learn how things worked before the great transformation took place." Such inquiry is of theoretical significance, speaking to debates about formalist, substantivist, versus historical materialist approaches in economic anthropology. "By studying several indigenous societies, each with different degrees of exposure to the

market, researchers can estimate the statistical weight of material, social, and ideological determinants and decide which of them matter most as economies modernize…material, social, and ideological determinants may carry different statistical weights and may vary in systematic ways" (Godoy 2001: 5). From an ecological anthropology perspective, a better understanding of the human environment interrelationship, and specifically how use and perception of land changes with economic and socio-cultural change is also of practical importance. Informed and effective conservation policy must take into account these dynamics as well as nuanced and contextualized approaches in working with different indigenous groups.

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