

Community Contradictions:
Petroleum Exploration, Development, & Huaorani Sociality

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ABSTRACT

The discussion of the impacts of petroleum exploration and extraction in the Ecuadorian Amazon has been largely focused upon the tragic linkages between oil-induced environmental catastrophes and the health of indigenous peoples. While regional environmental and social justice concerns are of critical importance and deserve continued attention, we approach the complex relationships between the Ecuadorian state, transnational petroleum companies, indigenous peoples, and the environment from a somewhat different perspective. We argue that, among the Huaorani, a critical and unexplored side effect of petro-capitalism has been to reify a Western image of community while undermining the inter-household networks critical to sociality. On one hand, a form of community recognized by – and, thus, amenable to negotiations with – extra-local actors has been constructed through a history of encounters between the Huaorani, missionaries, the Ecuadorian state, and petroleum companies over the past 50 years. On the other hand, the recent oil company community development programs that have emerged out of these historical relationships have the effect of undermining food exchange and sharing networks. Because of the importance of these networks for maintaining social bonds and mitigating subsistence risk among the Huaorani, we treat them as a proxy for Huaorani social relations and a non-Western form of community. In particular, two oil company community development initiatives – food provisioning and company wage labor opportunities – undermine Huaorani sociality by reducing inter-household visits and reducing the intra-household contributions of “traditional” food providers. However, with the departure of the oil company from the study site due to insufficient oil reserves, we witnessed the return of extensive patterns of reciprocity and inter-household exchange.

INTRODUCTION

Imagine the pulsing of helicopter blades, distant at first, but soon deafening. The helicopter is now directly overhead. It begins to drop and then lands slowly. From it white plastic bags full of rice, sugar, tuna, lard, drink mix, and other processed foods are unloaded. Women have gathered on a soccer field in the middle of the rainforest to pick up the rations that they receive as part of a community agreement with the petroleum company Oryx. Those who have happened to be away from the village working in gardens or fishing when previous food drops occurred found their rations usurped by other households. This reinforces “sit and wait” behaviors, where women forsake subsistence activities outside the village and instead spend time waiting for the arrival of the helicopter.

These events took place in 1997, following a four-year increase in global oil prices driven by rapidly increasing Asian consumption. More specifically, they took place in Ecuador, a country with approximately 5 billion proven barrels of reserves (BP 2007), where petroleum accounts for nearly half of national export revenues. Since the 1970s, petroleum exports have driven strong economic growth in the country. However, a cursory reading of national-level production and economic figures threatens to conceal the more complex reality of Ecuadorian petro-capitalism, where aggregate gains are not typically equally accrued across cultural groups and socioeconomic strata. Indeed, the nation's economic growth coincided with an era of growing disillusionment about wealth distribution across the continent, recently manifest protests related to petroleum extraction in the Amazon, burgeoning anti-globalization social movements across the continent, and the elections of leftist political leaders in many countries. These might be read as signs that, after decades of participating in and awaiting the benefits of structural adjustment and economic austerity programs, the promises of free market capitalism have noticeably failed to materialize in the daily lives of many people. The extraction of petroleum in the Ecuadorian Amazon is a particularly contentious case exemplary of many of the economic, political, cultural, and ecological tensions that exist across South America during a period of rapid global economic integration. As wealthy North Americans drive SUVs, native Amazonians in dazzling feather headdresses proclaim petroleum extraction a threat to their livelihoods and cultural survival, raising difficult questions about the distribution of burdens and benefits between North and South.

Complicating the Impacts of Petro-capitalism

Much of the discussion of the impacts of petroleum exploration in the Ecuadorian Amazon has been situated at the regional level and focused upon the pernicious environmental effects of exploration and extraction, including oil spills, soil and water contamination, and deforestation (e.g. Kimerling 1991a,b, 1993, 1996; Sandoval 1992; Miller 2003; Sawyer 2004a,b). Scholars and the popular media have also, rightly, addressed the tragic linkages between petroleum-related environmental degradation and increased disease incidence among neighboring populations (CESR 1994; Hurtig & San Sebastian 2002; San Sebastian & Hurtig 2004). Meanwhile, others have focused on indigenous social movements and the political struggles that surround petroleum in the region (Sawyer 2004b). We approach the complex relationships between the Ecuadorian state, transnational petroleum corporations, indigenous peoples, and the environment from a somewhat different perspective. Remarkably little has been written about the less conspicuous, but equally important, effects of petroleum operations on indigenous social

relations at the household and community levels¹. Following James Ferguson's (1994) suggestion that the most significant effects of development interventions may be unintended – that is, intentional plans interact with unacknowledged social structures and chance events to produce unintended outcomes – we focus on the effects of petroleum company “community development” programs on social networks in the Huaorani communities of Huentaro and Quehueiri-ono.

Communities are not simply bounded entities acted upon by extra-local processes, but may in fact be constituted through historical encounters with the “outside.” We argue that one important side effect of petro-capitalism in the Ecuadorian Amazon has been to – seemingly paradoxically – reify an image of Huaorani community while undermining the inter-household networks critical to group sociality. A form of community recognized by – and, thus, amenable to negotiations with – extra-local actors has been reified through a history of encounters between the Huaorani, missionaries, the Ecuadorian state, and petroleum companies over the past 50 years. These have included, but not been limited to, purposeful efforts by missionary groups to reformat indigenous community according to a Western image since the 1950s. We argue that recent oil company community development programs have emerged out of a historical complex of relationships of control, resistance, and negotiation between Huaorani and extra-local actors. The paper is broken up into two sections. In the first, we first discuss the concept of community broadly, provide a brief historical account on the production of a new form of Huaorani community, and introduce the case of Oryx Petroleum Company's exploration in Huaorani territory. In the second, we review the literature on sharing and subsistence risk and then analyze the impacts of two oil company community development initiatives – food provisioning and company wage labor opportunities – on Huaorani sociality.

PART I: MAKING HUAORANI COMMUNITY

This paper focuses on the experiences of two relatively isolated Huaorani communities, Huentaro and Quehueiri-ono, which are located along the Shiripuno River in Orellana Province, approximately 11 hours by non-motorized canoe from the nearest road. We situate these recent encounters within the broader historical context of the region, arguing that recent relationships between petroleum companies and the Huaorani can not be understood outside of the context of past political, economic, and ideological encounters between the missionaries, oil companies, the Ecuadorian state, and the Huaorani. In this section, we explore the manner in which a form of Huaorani community recognized by – and, thus, amenable to negotiations with – petroleum companies has emerged over the past 50 years. Whether intentional or not, we argue that a history of encounters with non-Huaorani actors has worked to reshape Huaorani community to one that better fits a Western image. While it is beyond the scope of this paper to explore these complex historical relationships in depth here, we contrast “traditional” Huaorani community with a Western image of community, introduce the key stakeholders in the region, and discuss Huaorani transformations in recent decades.

Western Community

Benedict Anderson writes, “Communities are to be distinguished, not by their falsity/genuineness, but by the style in which they are imagined” (2006:7). From this

¹ One exception is the work of anthropologist Laura Rival (1998; 2002), who has done this type of research among the Huaorani.

perspective, the question becomes: What is Huaorani community? We conceptualize these communities not as historically discreet entities acted upon by exogenous forces, but as hybrid social forms produced through a history of cross-cultural encounters. Our first task in understanding this process is to consider the models of community organization imagined by missionaries, petroleum companies, and state officials in their early encounters with the Huaorani. Raymond Williams traces the usage of community in the English language to the 14th century (1985:75). However, its use as a concept has been marked by frequent revision. The most important for our purposes is the version that has persisted since the rise of large, complex industrial societies in the 19th (75-76). During this period, community came to be represented an immediate entity distinct from the more abstract, instrumental, individuated, and formal constructions of state, nation, and society. The rhetoric of community-based development, conservation, and natural resource management ascendant during the 1990s drew heavily and often uncritically on such romantic constructions of community (Agrawal & Gibson 1999). As Watts (2004) points out, however, “community” is simultaneously modern and bound up with capitalism in that it is deployed as a tool of legibility and liberal discipline (2004:197). Along similar lines, Miranda Joseph sees communities as legitimating and producing the forms of hierarchy and difference “required but disavowed by capitalism” (2002:xxxii, quoted in Watts 2004:198). In northeastern Ecuador, petro-capitalism, missionary efforts, and the reorganization of indigenous community as sedentary and hierarchical were mutually-enforcing projects.

The Study Area

Ecuador is typically divided into three distinct regions: the coast, highlands, and the Amazon. This study is situated in the northeastern Ecuadorian Amazon, or *Oriente*, part of what is often referred to as the Upper Amazon Basin. The topography of the region is low and undulating to slightly hilly between the broad, swampy floodplains of the region’s main rivers, spanning an elevation of 200 to 600 meters. The annual temperature averages 25 degrees Celsius with extremes of 15 degrees and 38 degrees. The annual rainfall is 2425-3145 mm, with an average humidity of 88% (Herrera-Macbryde 1997). The Ecuadorian Amazon is characterized by high levels of biological diversity, with an exceptional concentration of endemic species experiencing rapid habitat loss (Myers et al. 2000). Since the 1990s, northeastern Ecuador has experienced the highest rates of deforestation in the Amazon basin (FAO 2005). The *Oriente* is also remarkably culturally diverse, home to the lowland Kichwa, Shuar, Achuar, Cofán, Siona, Secoya, Huaorani, and *mestizo* groups. These populations vary in population size, linguistic affiliation, history of contact, and diversity of economic activities (Holt et al. 2004).

The Huaorani

Before sustained contact began in the late 1950s the Huaorani has a reputation for “fierceness” and resistance toward outsiders, which allowed them to occupy a 20,000 km² territory bordered on the north by the Napo River and on the south by the Curaray River (Yost 1991:97). From a population numbering only about 500 at the time of missionary contact, Rival (2002) estimates their current population to be approximately 1400, although others put the number closer to 3000. Their language is *huao tededo*, a linguistic isolate that was never suppressed and replaced by Spanish. In 1969, a 66,570-hectare “protectorate” for the Huaorani was created, representing about one-tenth of the traditional territory. In 1990, the Huaorani were granted the largest indigenous territory in Ecuador (679,130 hectares), including the former “protectorate” and adjoining Yasuní National Park (Rival 2002).

Huaorani social organization was historically quite distinct from Western concept of community. Three aspects of Huaorani sociality prior to contact with missionaries are particularly salient with regard to our argument. First, the pre-contact Huaorani lived in small, extended kin groups, called *nanicaboiri*, which were largely autonomous. One to two families would live together on a clearing that they made together and shared. Due to warfare and hostility, there were few opportunities for inter-group decision-making or conflict resolution, and even gatherings to exchange marriage partners were often characterized by anxiety or aggression. Second, the political structure of the Huaorani was historically non-hierarchical and decentralized, with no established authority beyond individual persuasion or coercion (Robarchek & Robarchek 1998). Within kin groups, there were no headmen or formal councils; leadership was situational rather than established (Yost 1981). Third, the Huaorani were semi-nomadic, moving every three to four months and returning to the same locations cyclically (Larrick et al. 1979:163). Yost (1991) states that the maintenance of two or three living sites with gardens at different stages of maturation not only disperses human population pressure on an area, but reduces the visible evidence of habitation in a given area thereby reducing the chance of detection by enemies, and also providing a place to flee in the event of a raid by other Huaorani groups or non-Huaorani (*cowode*). In some cases, these semi-nomadic practices persist, but in others they have changed, as we describe later in the paper. Fundamentally, then, the pre-contact Huaorani were distinct from a Western image of community because they typically settled in small, kin-based settlements, were organized non-hierarchically or according to a situational hierarchy, and were highly mobile.

Oil and Missionaries in the Oriente

Missionaries seek to promote conversion to Christianity but may also – either intentionally or unintentionally – be the bearers more subtle cultural transformations (Comaroff & Comaroff 1992: 36). We argue that a particular image of community embedded in both missionary and capitalist oil extractions has precipitated certain types of expectations and encounters between outsiders and the Huaorani, bringing about two important forms of social change: 1) the emergence of the sedentary, centralized Huaorani village centers increasingly oriented toward acquisition of outside goods and services; and 2) the emergence of more permanent hierarchical leadership (in the form of a leader, community president, or spokesperson). First, missionaries from the Summer Institute of Linguistics relocated dispersed indigenous settlements to central, permanent mission settlements typically built around a school and landing strip (Lu 1999). Contrasting with the former *nanicaboiri* by the nucleated pattern of households around these amenities, the new communities also were differentiated by the presence of non- or distantly related-kin living together, brought together by a desire for things like education, medical care, and manufactured goods. Second, a generalized form of hierarchical leadership emerged among the Huaorani as new “cultural brokers” able to speak Kichwa and Spanish gained power through their ability to control the flow of outside goods and services (Yost 1981). Petroleum companies, like missionaries and other predecessors in the *Oriente*, wanted to negotiate with leaders, even though such formalized roles of representation and control were utterly foreign to the Huaorani. The expectation of community leadership may reify hierarchical power relationships.

Both missionary work and oil exploration in the Ecuadorian Amazon began in the early- to mid-

20th century. The first oil exploration took place in 1937 when Royal Dutch Shell received a concession contract to conduct reconnaissance work across most of the region, though the company eventually chose not to drill. Some of this work took place during the 1940s occurred near Huaorani territory and resulted in the death of company employees to Huaorani spears (Lu 1999). Shell returned in 1948, however, and drilled six exploratory wells. After two years and \$40 million in expenditures, Shell left Ecuador again because these wells failed to provide commercial quantities of petroleum. Up to this point, contact between the Huaorani and the “outside” had been minimal. This would change during the 1950s missionary attempts to establish contact increased. This began in 1955 when five young missionaries flying air reconnaissance located a Huaorani settlement. Over a several weeks, they dropped aluminum pots, machetes, salt, and colorful buttons from airplanes in what was called “Operation Auca.” In 1956, the first peaceful ground contact between missionaries and the Huaorani occurred. Two days later, a group of Huaorani men returned to the missionaries’ camp site, speared them, and destroyed the plane. It was 1958 before peaceful contact was again established. The Huaorani community of Guequetairi (56 people, living on the lower Tihueno River) welcomed the U.S. American missionaries Rachel Saint and Betty Elliot to come live in their village and teach about Jesus. Within the next 6 years, Guequetairi was established as a population center and missionary complex. In 1964, Texaco-Gulf discovered petroleum in southern Colombia, bringing petroleum prospectors back to the Ecuadorian Amazon for a third round of explorations. Oil was discovered in three years later in Lago Agrio, Ecuador, north of Huaorani territory. Within four years, more than 20 foreign companies were working in the region. The response of the Summer Institute of Linguistics missionaries to oil discoveries between 1968 and 1971 was to increase efforts to contact Huaorani and concentrate them in the settlement of Tihueno.

PART 2: UNDERMINING HUAORANI SOCIALITY

Since the 1967 discovery of oil in the region, there have been nine rounds of oil exploration in the *Oriente*. Petroecuador, the state oil company, solicits bids to drill in different oil concession units, or blocks. The successful bidder signs a contract with Petroecuador designating the terms of exploration and extraction. As a result of Ecuador’s seventh exploration bid round in 1994, Oryx Energy Company received concessionary rights to 200,000 hectares, delimited as block 21. From January to April 1996, the first phase of seismic exploration was undertaken in the northwest corner of the block, located near Kichwa communities along the Napo River. The second phase of exploration, undertaken in the first six months of 1997, involved seismic work in the southern portion of the block and almost entirely within the Huaorani reserve. This phase involved exploration along nine seismic lines with a total of 368.2 kilometers. About every 50-100 meters along these lines, holes were drilled 15-20 meters below the ground, filled with two kilograms of explosives, and detonated (Oryx 1997). By monitoring the movement of resulting sound waves through the ground, company geologists tried to detect potential oil reserves far beneath the earth’s surface. Besides the explosions, there were other environmental impacts involved in this exploratory phase. As all access to seismic lines was conducted with helicopters, 48-50 heliports were constructed, each about 30 x 30 meters, for a total of 45,000 m² cleared. Moreover, the very presence of exploration crews living and working in the area had environmental impacts.

Negotiating Oil Exploration and Community Development

Although more than 600,000 hectares of Huaorani lands are protected under the communal legal title they were granted by the state in 1990, they do not control subsoil resource and mineral rights – all of which are the property of the Ecuadorian state. According to the terms of their land title, they are not permitted to receive royalties from oil exploration and extraction, to obstruct oil development on their land, or to carry out extraction themselves (Rival 1998:10). On the ground, however, the reality has been quite different, with the Huaorani responding to the expanding oil frontier by invading and looting oil camps located on their hunting grounds. Anthropologist Laura Rival has documented the oil company practices that emerged in Huaorani territory as a result of Huaorani resistance:

North American and European oil companies, which have worked south of the Napo River since the late 1970s, have resigned themselves to the fact that native forest dwellers form an integral part of their industrial environment. They treat Huaorani villages as additional camps to be serviced and provisioned in the exact same way as any other working site. By delivering food and equipment to villages whenever they operate within Huaorani territory, companies hope to avoid the looting of their forest camps and the occupation of their well sites. During the seismic survey programs of 1989 and 1990, I saw helicopters fly weekly to every village and deliver what was usually given to oil workers: rations of food, pots, axes, gardening tools, tents, medicine, and so forth (2002: 168).

In 1993, the Huaorani Organization (ONHAE) signed an "Agreement of Friendship, Respect and Mutual Support" with Maxus Ecuador, Inc. for a term of twenty years, committing the company to provide assistance in education, health, and community development (Rival 1998: 11). During dissertation fieldwork in 1996-1997 in the Huaorani villages of Huentaro and Quehueiriono, one of the authors (Lu) witnessed the same patterns of oil company provisioning documented by Rival – presented as “community development” – undertaken by Oryx Energy Company during seismic exploration (Lu 1999). In order to enter and work in Huaorani territory, Oryx had, like Maxus, signed an accord with ONHAE on January 14, 1997, specifying the terms and conditions for completion of the seismic exploration program. As part of the community development component to their Environmental Management Plan for Block 21, Oryx tried to increase the likelihood of smooth operations by agreeing to provide certain benefits to the Huaorani, including office equipment for the Huaorani federation office, air transport of delegates to the Huaorani congress held in March 1997, food provisions, employment opportunities, and school supplies. Two of the most important measures for the purpose of this study were: 1) Oryx agreed to hire residents (men) of the Huaorani reserve as workers during seismic exploration (a few as “community relations” people but most as *macheteros* clearing seismic lines); and 2) Oryx would implement a food drop program in which bags of supplies would be delivered by helicopter to the affected villages (Oryx 1997). Practically all able-bodied men in the villages agreed to work for the oil company.

Sharing as Risk Mitigation and Expression of Sociality

One of the quintessential characteristics of native Amazonian societies is inter-household resource transfers, or sharing. In his review of hunter-gatherer life ways, Kelly (1995) called sharing the “sine qua non of hunter-gatherer culture in the minds of contemporary anthropologists.” The importance of giving gifts and sharing is a central part of children’s socialization and is reinforced throughout life. Sharing is important in maintaining an egalitarian

order (or at least the semblance of one), and the failure to share not only deprives one party of material items, but sends a strong symbolic message to the excluded. Among the Huaorani, to share food with someone expresses the notion, “I care for you, and want you to survive.” To deny such food exchange is to negate any social relationship altogether². Thus, it is a method of creating and reinforcing social bonds, and stores favors and obligations, rather than food or goods. Rather than a product of innate generosity or solely a desire to maintain social relationships, however, sharing patterns (what is shared, with whom, under what conditions) can be fruitfully understood as a means of reducing subsistence risk.

Risk can be broadly defined as unpredictable variation in the outcome of a behavior, with fitness or utility consequences for an organism (Winterhalder et al. 1999: 302). For our purposes, risk will be explored in terms of food shortfalls, or the failure to achieve a fixed level of consumption. Operationally, it may be measured as variance in acquiring resources during foraging episodes (Hames 1990: 90)³. Anthropological studies of subsistence risk (see review in Winterhalder et al. 1999) have examined a variety of methods in which human populations have attempted to reduce the probability of not acquiring enough food, including the reduction of group size; movement to an area with either a lower variance in foraging returns or a higher mean return; alteration in foraging practices (e.g., over-production or diversification); storage of resources⁴; exchange some portion of resources for durable goods and exchange goods for resources in the future; storage and transmission of information about famine foods; or through sharing and exchange. Sharing, the practice of reciprocal resource transfers, has been proposed to be “an adaptation to periodic scarcity, a form of collective insurance against natural fluctuations in both productive ability and available resources” (Smith 1988: 234). Food sharing pools the yield from separated foraging expeditions, and allows participants to consume shares more evenly than they were acquired due to asynchronous spatial-temporal differences in return rates.

The subsistence risk model of sharing has found empirical support among studies of native Amazonian populations. Hames (1990), for example, examined sharing patterns among the Yanomamo of Venezuela and Brazil, testing whether different resources with varying return rates are shared differently. He found a strong association between risk and frequency of sharing; gardened foods, for which harvesting returns are regular, are shared the least, and large game is shared the most, with gathered foods, fish, and small game intermediate and ascending. There was also a less pronounced but statistically significant relationship between resource type and scope of sharing (i.e., the average number of families receiving portions during an exchange). The scope of exchange is highest for large game and lowest for gardened foods. Work among the Aché of Paraguay underscores the importance of sharing to meet subsistence needs. Without food sharing, Aché families are likely to experience two weeks in which they acquire less than 50% of their caloric needs about once every two years (Kaplan et al. 1990: 114). The mean standard deviation across days for families with complete sharing of all food is

² It would be incorrect to assume, however, that sharing is ubiquitously a “feel-good” activity. On the contrary, pressure to share (demand sharing) can lead to strain between people, and often people engage in elaborate behaviors not to share (e.g., hiding stores of food and goods, eating in the late night/early morning).

³ The stochastic variation associated with risk only has psychological or material significance if there is a nonlinear relationship between the material outcome itself and the value of the outcome (Smith 1988: 234).

⁴ Storage of food is impractical in a rainforest environment where rotting and infestation occur rapidly.

63% lower than without sharing. Sharing of honey alone increased nutritional status⁵ by 20%, whereas sharing of meat alone increased nutritional status by 40%. Sharing of all food increased nutritional status by 80% (Kaplan et al. 1990: 124, 126). Thus almost all individuals achieved higher nutritional status by sharing food and substantially reduce day-to-day variation in consumption.

Methodology

The data presented here includes Lu's dissertation research in Quehueiri-ono and Huentaro in 1996-1997 and a second round of research in the communities during a National Institutes of Health-funded project in 2001. The methodologies used in both periods were comparable and included interviews, time allocation, and participant observation. Ethnographers collected both qualitative and quantitative data. The qualitative data focused on the implementation of a number of formal, semi-structured questionnaires covering demographic behavior and attitudes, agricultural production and resource use, household economics, natural resource use, contact with outsiders, and socio-economic attitudes and values. Detailed quantitative data were collected using two methods, the first being "spot check" time allocation (Borgerhoff-Mulder 1985). To examine the different labor tasks and inputs and their variation by age, gender, household size/composition, and ethnicity, a time allocation survey using spot observation was carried out. The time allocation data were collected for people of age five and older, through almost daily household visits at random times. The following data were noted on each data form: name of community; name of head of household, date of observation, observer, and time of observation. For each member of the household, the following data were recorded: name of person observed; general and specific activity code; location; presence of visitors (and their age and sex); and, if the subject was not present, their reported activity and the name of the informant providing that information.

For more quantitative data about the household economy, in the 2001 project we also developed an "Input/Output Household Diary" data sheet (*Diario de Ingresos/Egresos*) to record, on a daily basis and in a systematic manner, all goods and services flowing into and out of households. The flows were further characterized by 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 sustenance, 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.

⁵ In Kaplan (1990), the concept of "nutritional status," was rather vague. This measure is approximated by the amount of food available, assuming that each increment in food confers an equal increment in nutritional status until additional food units are of no value, i.e., when 12,500 calories per day are acquired by a couple with one child (125). Thus, the measure of "nutritional status" does not actually take into account the various nutritional elements (e.g., fat, sugar, carbohydrates, protein, etc.) in different foods.

Sharing Among the Huaorani

For the Huaorani of Quehueiri-ono and Huentaro, we collected data on dietary intake and sharing patterns pre-oil exploration (1996), during petroleum exploration (1997), and post-exploration (2001). Among the avid hunters of the Huaorani of these villages, sharing was found to mitigate subsistence risk. In a study of Huaorani hunting encompassing 92 post-hunt interviews, Lu (1999) found that hunting is an endeavor characterized by extremely variable rates of return. Of the 92 hunts analyzed, 23 were unsuccessful, with hunters returning empty-handed. The mean caloric return from a hunt was 8,277 calories, with a standard deviation of 13,753 calories. Moreover, inter-forager success is asynchronous because men usually use different trails and hunt alone (in 68% of recorded hunts men were not accompanied by other men). Furthermore, this asynchrony results from differing hunting aptitudes. The individual mean kg/hr hunting returns of men over age 20 ranged from 0.12 to 4.16. In a sample of 12 days in which multiple men from the village went hunting, the inter-forager standard deviations per day were anywhere from 3.7 to 30.4 kg, with a mean yield of 11.7kg.

Among the Huaorani, more variable resources are shared more, a finding congruent with a risk mitigation perspective (Lu 1999). Although hunted foods (game, fish) represent 16% of total food consumed (n=939), they represent 53% of total inter-household exchanges and are exchanged significantly more than other types of food ($p < 0.0001$). According to Hames (1990), in order to smooth out the variability in acquisition rates, large animals should be shared the most, followed by, in descending order, small game, fish, gathered foods, and gardened foods, a pattern he found among the Yanomamo. Lu calculated the proportion of the number of times that each of these food types was the product of inter-household exchange over the number of times it was eaten. Large game was shared 58% of the time, followed by small game, fish, gathered foods, and gardened foods. Large game was shared almost ten times more frequently than gardened foods. In testing the risk model for sharing among the Huaorani, Lu found support for the hypothesis that the inter-household transfer of food is biased toward foods of high variance in acquisition, such as hunted foods. Within the category of hunted foods, large animals, the most variable items, were shared the most often. For the Huaorani, then, sharing is a cultural value through which people emphasize generosity and giving as a means of maintaining kinship and friendships, but it is also a means of dealing with the subsistence risk of living in a rainforest environment.

Dietary Intake: Food Categories

In light of these “traditional” sharing patterns among the Huaorani, we turn to a discussion of changes in dietary patterns and inter-household transfers during the era of seismic exploration and community development. Figure 1 shows the contributions of five different food categories to the Huaorani diet before and during Oryx’s presence near Quehueiri-ono. The categories are: hunted and fished, gardened, gathered, purchased, and raised. These are self-explanatory, except for “raised,” which refers to small stock and domestic animals, in this case eggs and the chickens slaughtered for special occasions. Raised animals compose only a small percentage of the diet, which reflects the Huaorani’s continued dependence on forest fauna for survival.

The dietary analysis that follows focuses on three of the five food categories—hunted, gardened, and purchased—and how their contributions to the Huaorani diet changed as a function of

Oryx's influence. Dietary intake is measured in terms of the frequency (% of days sampled) with which a particular category of food was consumed. During oil exploration, the consumption of hunted and fished foods dropped from 22.3% (111 observations) of the Huaorani diet to 8.8% (30 observations). This difference is significant ($p < 0.0001$). In particular, the capture of peccaries and monkeys dropped dramatically after opportunities for petroleum wage labor took many male heads of household away from their families; these prized animals are not easily captured by women and children, most of whom are not proficient in the use of a shotgun. Moreover, peccaries are known to attack people and inflict vicious bites; monkeys are not as vicious but require a talented hunter able to walk the long distances needed to find them, track them, and fire a weapon with strength and accuracy. The dietary contribution of birds and rodents (like agoutis and pacas) did not drop as drastically. Birds are ubiquitous (an exception being the larger guans and curassows which are easily overhunted), so boys with blowguns can hunt them with some effectiveness. As described before, women can kill agoutis and pacas during opportunistic garden hunts. In comparison to peccaries and monkeys, birds and rodents are plentiful and can be found closer to the village, are less dangerous to hunt, and can be killed easily with weapons other than shotguns.

The consumption of gardened foods also dropped during food provisioning, but not as precipitously as that of hunted foods. The contribution of the *chacra* (garden plot) declined from pre-Oryx levels of 62.6% (311 observations) to 31.9% (109 observations). This change was also found to be significant ($p < 0.0001$). Manioc and plantains provided the bulk of the pre-Oryx Huaorani diet and almost all of the carbohydrates, but the consumption of these gardened foods was cut in half as the consumption of company-donated rice increased. As Oryx cut seismic lines, Huaorani women and children were eating fewer bananas, pineapples, and papayas. While this could be a simple matter of substituting purchased foods for gardened foods, it may also be attributable to the fact that gardens were neglected while nearly all of the able-bodied men – who typically assist in clearing and weeding – were away working for the company. The consumption of purchased foods replaced other categories among the Huaorani, rising to almost nine times pre-Oryx levels, from 7.4% (37 observations) to 59.1% (202 observations). This difference was significant ($p < 0.0001$). Purchased items included, but were not limited to, rice, noodles, canned tuna, drink mix, oatmeal, sugar, flour, and coffee, food items delivered to the community as part of the helicopter-delivered rations⁶ but also obtained through Huaorani visits to the oil camps.

Dietary Intake: Food Providers

Not only did the types of foods consumed change during seismic exploration, but so did the providers of that food. Before seismic exploration and the entrance of Oryx, the bulk of the diet (58.4%; 297 observations) was provided by female heads of household, and over 92% (274 observations) of this food came from the garden. The male head of household provided 13.1% (65 observations) of the diet, which, though miniscule by comparison with the female contribution, is important because the food types he provides complement those of his wife. The

⁶ The food provided by the oil company was inferior to the normal diet; the rations were composed of processed and refined foods, mostly cheaper carbohydrates and little protein (five pounds of white rice but only 12 ounces of canned tuna). Moreover, at each ration distribution, a family would receive five pounds of white sugar and four and a half pounds of salt.

majority (67.7%; 44 observations) of the male pre-Oryx contribution involved protein-rich hunted or fished foods, while gathered foods comprised 15.4% (10 observations) of his overall contribution, while, for female heads of household, gathered foods comprised 5.1% (15 observations) of the overall contribution. This may reflect the ease of collecting forest foods while out hunting. The pre-Oryx purchased foods were mostly supplied by men, who earned money by selling meat, live animals, handicrafts, or crops, and who decided when to go on purchasing expeditions at the nearest market. The contributions of sons and daughters were 3.7% (21 observations) and 2.6% (15 observations), respectively; they mimic the gender complementarity seen in adults. Girls provided mostly gardened foods, and boys provided mostly fish and the occasional forest animal.

Sharing and exchange between related households reaffirms kinship ties and represents an important source of food. Of the food surveyed, 15.9% (79 observations) was provided to households by other households. Like many other hunter-gatherer populations, the majority of food shared by the Huaorani is meat (51.9%; 41 observations). It is not unusual, then, that interviews with individuals emphasize the importance of sharing the kill. Surprisingly, horticultural food is widely shared as well (31.65%; 25 observations), perhaps to assist families whose gardens are not producing at the time. The food provided by “Flora” refers to that provided by the author (Lu) during fieldwork and was comprised of purchased foods such as rice, tuna, and cookies.

The contributions of all the usual providers changed dramatically when Oryx began to operate in the area. The amount of food provided by fathers dropped by more than two-thirds percentage-wise (65 observations to 10 observations), and the percentage of the diet provided by mothers was nearly cut in half (from 297 to 110 observations). As families were allocated identical individual rations by the oil company, the amount of sharing between relatives (i.e., the percentage of the diet coming from other households) fell to one-third of the pre-Oryx level (79 to 19 observations). Changes in the food quantities provided by sons, daughters, and the author (Lu) were not found to be significant, but this probably reflects the small sample size. The oil company came into this part of Huaorani territory and usurped the roles of traditional food providers—fathers, mothers, children, and other kin. In a short period, Oryx went from having *no* role in food provisioning to supplying over *half* of the total Huaorani diet.

Inter-Household Sharing Before and After Community Development

As families were allocated their rations by the oil company, the amount of sharing between households decreased from 18% to 6%. If the sole function of sharing is the reaffirmation of kin ties and sociality, we would expect that food rations would be shared as well. A risk theory of sharing, by contrast, predicts that unlike hunted game or even harvested manioc, the food provided by Oryx would not be exchanged between households. The oil company food drop program, in which white bags containing identical allotments of items such as rice, sugar, tuna, lard, and drink mix were helicoptered in from time to time essentially eliminated variability in the acquisition of food. All households received exactly the same varieties of food, in the same quantities, and at the same time. The inter-forager correlation of food acquisition was equal to one, and there was no risk mitigation benefit in sharing. Oryx’s food donations, apart from being comprised of items appealing in terms of their taste (i.e., salty, fatty, sugary) and prestige (i.e., food of the city), required no time or effort to acquire. Mothers simply walked from their homes

to the soccer field and picked up their food rations. Women who happened to be away from the village working in gardens or fishing when a food drop occurred found that their rations were usurped by other households, reinforcing “sit and wait” behaviors that further reduced the frequency of already-declining subsistence activities. These unpleasant events led to food hoarding rather than sharing. Concomitantly, visits to other households declined (as these usually center on food sharing), and the social life in the village became more subdued during this period.

In the beginning of 2001, a period not characterized by petroleum exploitation activities, we returned to the same Huaorani villages and found that social and economic patterns were similar to those witnessed before seismic exploration. Inter-household transfers were once again prevalent. In the input-output household diaries, residents were asked if they had received any item from another household that day and if they had shared with other households that day. Among these Huaorani, fully 41.7% of participants and 43.4% of household-days witnessed such receiving and giving, respectively. Approximately 95% of the items transferred between households were food, indicating the predominantly subsistence-oriented nature of inter-household resource transfers. In terms of diet, the hunting orientation of the Huaorani was clear: of 1,112 household-days of dietary checklists, 69% of the days witness the consumption of meat from hunted animals, whereas domestic or purchased meat was consumed on only 4% of the days (unfortunately, the dietary data from this time does not allow for a further breakdown of intake of purchased vs. non-purchased foods). Data from time allocation found that visiting other households is a common social activity, encompassing approximately 11% of the diurnal time budget of Huaorani informants, indicating the prevalence of this activity that centers on the exchange of food.

CONCLUSIONS

While concerns about environmental degradation, health outcomes, and social justice associated with oil exploration and extraction in the Ecuadorian Amazon are of critical importance and deserve continued attention and research, we bring historical and risk mitigation perspectives to bear on exploring the forms of social reorganization precipitated by relationships between indigenous communities and oil companies. We have argued, through an investigation of community development projects in two Huaorani communities in the late-1990s, that the social effects of petro-capitalism may not always be readily apparent in the absence of detailed ethnographic analysis. This study demonstrates that recent community development programs associated with petroleum exploration have important side effects: they work to undermine food sharing practices, the traditional basis of Huaorani social networks and risk mitigation. Ultimately, inter-household food sharing is an important behavior for both the social and physical survival of the Huaorani. It reaffirms inter-household social bonds and mitigates the variability in resource acquisition common among this hunting-oriented ethnic group. During the era of oil company food provisioning in the study communities, inter-household visits declined (as they usually center on food sharing) and the social life of the village became more subdued. Due to employment opportunities with the company and food provisioning, the intra-household contributions of traditional food providers (mothers, fathers, and other households) fell dramatically. Oryx’s community development efforts in Huentaro and Quehueiri-ono during 1997 should not be thought of as an isolated event, but as emblematic of historical process of “hollowing out” Huaorani community, in which a form of community recognizable to outsiders

becomes more concrete even as everyday social relations are undermined. Missionaries, oil companies, and other extra-local actors have interacted with the Huaorani over the past 50 years and both intentionally and unintentionally worked to reformat communities in a Western image legible to outsiders. The message, though, need not be so grim; the importance of sharing and reciprocity as both manifestations of sociality and means to mitigate subsistence risk was demonstrated by the return of the study villages to patterns of visiting and sharing existing before Oryx's petroleum exploration once the company left. In areas of Huaorani territory where commercially viable amounts of petroleum have been found, however, continued work examining the repercussions of "community development" efforts is sorely lacking.

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Figure 1: Food Categories as Percentage of Huaorani Diet Pre-Oryx (Outer Ring) and During Oryx (Inner Ring)

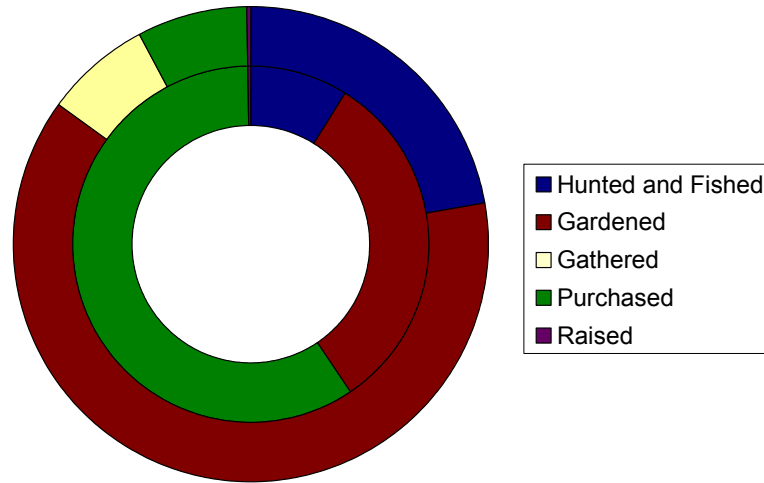


Figure 2: Food Providers as Function of Oil Company Presence

