

## Chapter 9

# Conclusions and Implications

### **A. Hunter-gatherers in a mixed economy: Original affluence, or persistent penury?**

In this dissertation I have explored several aspects of variation and diversification in the economic lives of Mikea households in the northern part of the Mikea Forest of southwestern Madagascar. My description conflicts with popular accounts of the Mikea (Dutilleux 1997; Ushuaïa 1997; Mouyon and Fancelle 1999; Rarojo 1999), which assert that these are pure foragers—one of the world’s last isolated remnants of what was once an unbroken fabric of Neolithic hunter-gatherers spread across the globe. Local lore describes the Mikea as a timid and technologically backward people that eke out a living in the forest because they do not know anything better (specifically, agriculture and markets). As I have discussed in Chapter 2, this view of the Mikea has been promoted by journalists and documentary filmmakers. These reporters have not spent enough time living with Mikea to notice many of the realities of their current lifeways and their recent history. Instead, they have drawn hasty conclusions influenced by European notions of what primitive, savage hunter-gatherers are like; notions that are deeply imbedded even within Malagasy folklore and primary historical sources (Berg 1977). Moreover, the very definition of “Mikea” within the scheme of social identity construction of southwestern Madagascar means “forager, forest dweller,” in contrast to their neighbors, the Vezo fishers and the Masikoro farmers (Yount 1996; Poyer and Kelly 2000; Yount, Tsiazonera, and Tucker in press). However, those people who call themselves Mikea today actually practice a highly diversified household

economy, combining foraging, farming, herding, retailing, and wage labor activities.

I have suggested that the Mikea economy has probably always been somewhat diversified. Oral histories trace Mikea origins to farming and herding populations that fled into the forest during the past four or more centuries to avoid political conflicts, tribute obligations and slavery. Mikea oral histories of the eighteenth and nineteenth centuries are rife with references to events that occurred in pasture territories (*toetsaombe*), gardens (*baibò*), and slash-and-burn fields (*hatsake*), elements of a diversified household production portfolio.

Mikea deviate from the expectations of western scholars as well. Mikea foragers understand agricultural practices and the market system of exchange, but do not always choose to rely on them. Men do not preoccupy themselves with hunting big game animals (for none exist), but forage for tubers and small mammals alongside women. They do not share food universally or display public generosity with foraged goods, but only practice limited forms of nonmarket exchange. They do not live in harmonious peace with nature, but instead contribute to the deforestation of the forest which supports them. They are not relicts of distant past, but are peasants in the present, refugees from chiefly and colonial hegemony.

The Mikea do not conform to classic Western archetypes. The Mikea Forest is no Garden of Eden, and the Mikea are not Rousseauian noble savages. The Mikea Forest is a difficult place to live, with unpredictable rainfall, a paucity of surface water, and sandy soil. Yet the Mikea struggle for survival is hardly as Hobbes (1991[1651]:89) described, “solitary, poore (sic), nasty, brutish, and short.” Compared with other Masikoro and Vezo, Mikea appear to have more options available to them during rough times. Foraging was in some cases very profitable, especially for the wild tuber *ovy*.

A visitor to the Mikea might come away with either Rousseauian or Hobbesian impressions, depending on what day he visited. A visitor to Behisatse during March 1998 would have witnessed women leaving camp and returning a mere hour later with as much as 18 kg of *ovy*. The visitor may conclude that the Mikea conform to Lee’s (1968) description

of Ju/'hoansi foragers, whom he observed to have worked a mere three hours a day. A visitor three months later would have found a very different situation: small children crying of hunger as parents spent upwards of eight hours each day foraging, bringing home with them a mere 8 to 10 kg of tubers. This visitor may conclude that Mikea resemble the Ache men studied by Hill et al. (1985), who were observed to work seven hours daily.

Not only is there diversity among foragers in time allocation to subsistence (Hames 1992:232), there is considerable variability within communities from one season or year to the next. The Mikea appear to deal with this unpredictable variation through diversification. If a society of “pure foragers” does indeed exist somewhere today, then they must either live in a less risky environment or have strategies that are more effective than diversification for buffering risk. For the Mikea past and present, and likely for other post-Neolithic hunter-gatherers, diversification into agriculture, herding, and marketing is almost inevitable.

## **B. Tradeoffs and diversification, and their implications for general models of subsistence change**

In order for a household to successfully diversify its production and exchange activities it must deal with some important tradeoffs, which I have discussed throughout this dissertation. These tradeoffs include how many adults versus children to have in the household; whether or not to participate in nonmarket exchange; which markets to participate in (if it all); and whether to invest in immediate return activities such as foraging, or delayed return activities such as agriculture.

These tradeoffs are important beyond the specific case of the Mikea. People throughout time and around the world have faced, and are facing, tradeoffs of these sorts. The decisions made by Mikea mirror to some extent the decisions made by other peoples who have changed emphasis from one subsistence strategy to another. Neolithic peoples of the Levant faced these tradeoffs when they de-emphasized gazelle hunting and wild seed foraging and emphasized wheat cultivation (Bar Yosef and Meadow 1995). Sioux households faced these tradeoffs as they de-emphasized maize agriculture near the Great

Lakes in favor of bison hunting on the Great Plains. Teotihuacanos of central Mexico faced these tradeoffs when they decided whether to consume their own corn or to exchange it at the marketplace (Berden 1989). By looking at Mikea behavior, we may gain clues as to how to begin to assemble a general model of subsistence change, affecting societies as diverse as these.

The first tradeoff deals with household size and composition. Mikea households strategize to manipulate the size of their household, largely through fosterage arrangements. I have suggested that Mikea strive for an optimal balance between the number of food producers and the number of food consumers they have in their household (Chayanov 1966[1934]). For the Mikea, the data suggest that every person older than a toddler could potentially feed himself or herself from their own tuber foraging labor with only an average of few hours of work each day. However, the average number of dependents in the 26 focal households in this study was only 2.7, suggesting some cost to having juveniles in the household. The average tuber return rates for juveniles may conceal the fact that juvenile foraging rates are quite variable. As the season wears on and tuber patches closer to camp become exhausted, mobility must increase. By July 1998 children were doing very little foraging because they could not keep up. Meanwhile, children did not contribute significantly to agricultural labor. In the last chapter I found that consumer/worker ratio did not predict the degree to which households planned to rely on agriculture for their total caloric needs, but that other variables relating to the size of the household, particularly, the number of workers (foraging children and farming adults) had significant predictive power. Larger households appeared to have less ability or motivation to feed themselves through their own agricultural labor. It appears that the ideal Mikea household size is both small and well connected to kin. Small households are more mobile in foraging and can more easily cover their food needs through agriculture. Well-connected households have the potential to loan away their children and thereby increase mobility and decrease subsistence requirements ( $R_{min}$ ).

Nonmarket, intragroup, interhousehold food transfers and demonstrations of public generosity—glossed throughout most of the anthropological literature with the term “sharing”—is an almost universal behavior among hunter-gatherers, but it is extremely limited among the Mikea with whom I lived. Theories of why foragers exchange food follow two lines of reasoning. The first line of reasoning says that foragers are generous because they know that their generosity will ultimately be repaid. They may be repaid in kind (reciprocity; Sahlins 1972), with fitness-enhancing benefits (the showoff hypothesis; Hawkes 1990; 1991), or they may be compensated through the benefits of broadcasting honest information to others (costly signaling hypothesis; Smith and Bliege Bird 2000; Bliege Bird, Smith, and Bird 2001). The second line of reasoning asserts that foragers are generous because it is more costly to defend resources against others’ demands than it is to tolerate a certain degree of loss. Peterson (1993) has noted that many foragers give resources away to their fellows only because their fellows pressure them to be generous (demand sharing). Likewise, Blurton Jones (1984, 1987) has argued that the losses to scroungers and free riders may be tolerable if the marginal utility of the relinquished good is quite low (see also Winterhalder 1996).

The Mikea case casts suspicion on the first line of reasoning. In general, Mikea do not transfer food between unrelated households, and public knowledge of foraging success is kept as private as possible. This cannot be explained by reciprocity, showing off, or costly signaling. By avoiding food transfers, Mikea cannot be accomplishing any of the objectives proposed by these theories. The show off hypothesis doesn’t predict why generosity would enhance the fitness of Ache men but not Mikea men.

Food transfer behavior among the Mikea is more consistent with the second line of reasoning. Even the layout of a Mikea camp appears to be designed to favor privacy, and discourage demand sharing. Winterhalder’s (1996) mathematical treatment of Blurton Jones’s tolerated theft hypothesis (1984, 1987) predicts that when resource packet size is small, giving pieces of the resource away would incur unacceptable losses of utility for the

donor. Most of the food resources in the Mikea Forest are either small or highly storable. Decision-makers are not likely to experience diminishing marginal utility, so transfers never become tolerable. The one clear exception in the Mikea case is slaughtered livestock, which are large and perishable. Consistent with the model, meat from slaughtered livestock were consistently widely distributed.

“Sharing” should not be assumed to be a default nonmarket exchange activity among hunter-gatherers and others. Archaeologists concerned with interpreting the lives of prehistoric foragers ought to consider the size of the potentially-exchangeable resource packets and their preservability as important factors affecting the transferability of food between households. An important research question may be whether market exchange evolves differently from nonsharing foragers than it does from generous foragers. The tolerated theft model suggests that in nonmarket exchange, goods are valued by their marginal utility. How does this type of value get transformed into explicit commodity value at the genesis of markets? Foragers who do not experience diminishing marginal utility of their resources may be unlikely to part with them through market exchange as well, unless they are well compensated.

Mikea are geographically situated to exploit supply and demand inequities between markets on the coast and markets on the savanna. Mikea can produce either protein or carbohydrates through foraging. Protein is profitably sold in savanna villages such as Vorehe, where a vendor can liquidate 150 cooked *tambotrike* in just a few hours and earn 75,000 malagasy francs, enough money to purchase new clothing for two people. Carbohydrates can be profitably sold on the coast, where wild tubers and honey are eagerly purchased by fishermen who are bored of eating fish. However, there is a lot of variation in the market behavior of Mikea households. High transaction costs appear to constrain the profitability of retailing. A more important determinant of market behavior appears to be the financial status of the household itself. Households facing food shortages may wish to emphasize acquisition of food value. Interestingly, this may be accomplished either by the

household's eating its own production, or by selling the food and using the profits to purchase a larger quantity of low-quality food.

Households decide whether or not to participate in markets based on the contrast between how they value goods (and how they weigh transaction costs) and the value assigned to goods by the market. Subsistence producers may decide to convert to market exchange when: (1) the transaction costs are low (including the social costs); (2) the market price of a sellable good is greater than their own marginal utility for the good; and (3) when the market price of a purchased good is less than their marginal utility for that good. Risk and shortfall may actually encourage people to become involved in markets, if it provides them with a method for converting a good that grants little utility into much needed food value or security.

Mikea households appeared to preferentially emphasize foraging, thereby intentionally underinvesting in agriculture. Even when swidden maize fields could potentially have been of any size at low cost, Mikea households tended to plant small fields that were too small to produce enough food to feed their families under optimistic circumstances. I have argued that this may have to do with the long delay between land preparation and harvest. Farmers conceive of delayed agricultural rewards as highly uncertain, a "drunkard's promise;" crops have long exposure to possible threats such as insufficient rainfall, grasshoppers, unsupervised cattle, and thieves. Meanwhile, wild tubers provide high and rather constant rewards in the present. Mikea may not value agriculture very highly because the immediate rewards from *ovy* foraging are greater than the discounted future rewards from agriculture. However, when portfolio performance is imagined in the beginning of the agricultural cycle, the large potential rewards from farming may be evaluated independently from the delay, consistent with the phenomena of "Allais' Paradox." Decision-makers desire the long-term benefits of cultivation, but on a daily basis when farming labor is required, they cannot endure the opportunity costs of not foraging.

Foragers are unlikely to convert into farmers as long as agriculture is risky, highly delayed, or low yielding while foraging provides high immediate rewards. The following changes could lead to increased emphasis on agriculture: decrease in foraging efficiency, increase in agricultural production, decrease in the delay between land preparation and harvest, or decrease in the riskiness of farmed crops.

In summary, a general model for subsistence change ought to consider the following set of variables. The first set of variables relates to the household: household size, household composition, the productivity of each type of household member (age/sex group) and the fluidity of household composition (availability of fosterage). Secondly, in regards to food production, for each activity there is a certain mean reward, probability of failure (reflected in the standard deviation of reward), production costs, and a delay to the reward. The third set of variables relates to exchange: the marginal value of goods that the household produces and purchases (related to their size, quantity, and preservability), market prices, and transaction costs. The set of relationships represented by these variables together simulate a variety of important household subsistence decisions.

### **C. Future research directions**

Herein, I have mapped out some of the basic relationships influencing household subsistence strategy in the face of unpredictable environmental variation. However, before a general model of human subsistence change can be attempted, behavioral ecologists need to be more specific about the relationship between measurable currencies, utility, and fitness.

The evaluation of the adaptive significance of a behavior ought to be a three part process. First of all, humans optimize consumption of certain measurable currencies—cash, energy, macronutrients, and time among others. Secondly, humans subjectively evaluate these currencies according to how badly they are needed. This subjective value, called utility by economists, is tricky to measure empirically, although we may be pretty sure of the overall shape of utility functions. Third, acquisition of utility ultimately contributes to a

household's survivorship and reproduction—and thus, Darwinian fitness. An adaptive behavior is one that produces a payoff that contributes to utility such that the actor is motivated to practice the activity at a frequency that will yield fitness benefits.

No one has really investigated the adaptive value of behaviors at all three of these levels. Optimal foraging theory models usually skip the middle step. A common assumption in optimal foraging theory is that foragers maximize acquisition of a currency, or more often, acquisition rate, and that this translates directly into increased fitness. This assumption disregards the changing marginal utility of energy. Once a subject is well-sated, consumption of additional energy will cede diminished utility. Economists are accustomed to working with this relationship, but they rarely proceed to the fitness level.

This three-part process translates economics into adaptation. With this feat accomplished, the big question becomes, how much of recent historical change in subsistence behavior has occurred as an adaptive response to changing stimuli? Contrarily, to what degree has subsistence change been nonadaptive or neutral, but caused by externally-imposed political or economic constraints? The Mikea Forest may be a good field site for examining this issue, because of the great variability of subsistence strategies in the present and the long recent history of political and economic flux. The challenges of historical research in the Mikea Forest region are the paucity of written historical sources and the lack of previous archaeological fieldwork. I envision conducting such a project using a multidisciplinary team of ethnographers, demographers, oral historians, and archaeologists. The research teams would simultaneously collect data on ecology, food production, and the political economy of the region.

I intend to keep track of the economic lives of the 26 households in this study throughout this next decade. This would enable a view of how households' portfolios change dynamically, and how households react to both environmental variability and historical change.

#### D. The future for the Mikea

In 1998, representatives of the Malagasy governmental organization ONE (Organization National de l'Environnement) visited to Vorehe to give a *kabary* (a public speech) to discuss plans for a "Mikea Canal" that would irrigate all the "unused" land around the village. The irrigated land would be divided evenly among all the Mikea households in the forest, in exchange for an agreement to stop chopping down trees. This plan had been attempted before in the southern part of the Mikea Forest, west of the village of Ankililoake.

ONE assumed that Mikea plant *hatsake* because they are new to farming and do not know any better techniques. Yet, as we have seen, Mikea have a long farming history. I propose that Mikea practice *hatsake* because it is the least labor intensive farming technique available, and household labor is limited. So long as tubers are profitable and agriculture is risky, low-cost farming techniques ought to be preferred.

The main problem with the irrigation plan is that it assumes that rice agriculture is more beneficial to poor Mikea households than *hatsake*. Malagasy hold rice in high esteem. Rice agriculture symbolizes civilization. However, cultivating irrigated rice is a very labor-intensive activity. Mikea households lack endogenous labor, for family sizes tend to be quite small; and they lack the capital necessary to hire labor. Mikea households are not likely to invest much time and energy in rice fields so long as less costly alternatives exist.

Interestingly, Mikea from the Namonte Basin *already have* almost unlimited access to irrigible land. The seasonal lakes of the Namonte Basin have been sown with rice in the past and there are some rice paddies there today. Any household from Behisatse or Amondralambo or half a dozen other forest communities could be growing irrigated rice already, but they have chosen not to. This further suggests that *hatsake* is actually better from the household's perspective, even if environmentally unsustainable in the long term.

Another aspect of this is that the Namonte Basin is isolated from markets by the coastal dunes to the west of it. Perhaps Mikea households would find rice agriculture at

Namonte to be more profitable if they had a solid road across the dunes to the coastal villages or the city of Morombe, where carbohydrates are highly valued.

There is also some question with the Mikea Canal plan as to how the land would be divided. A local proponent of the plan in Vorehe told me that the president of the *commune rurale* (county) would visit each Mikea community, and allocate equal portions of land to each household. This would be tricky to implement, for the definition of who is “Mikea” is ambiguous (Yount 1996; Poyer and Kelly 2000; Yount, Tsiazonera, and Tucker in press). Some say that any forest resident is Mikea, others say that anyone living west of the Iovy creek is Mikea. The definition of Mikea, and people’s willingness to identify as such, seems to have changed since the Mikea Canal plan was unveiled.

The best way to limit the extent of deforestation is to eliminate the maize market. I have not discussed the maize market very much in this dissertation because it did not affect the households I observed very much in 1997-1999 (although it was more important in 1996). Deforestation in the northern part of the forest, where I focused my research, was rather limited, with average *hatsake* sizes of only a hectare or two. Plus, in the Midforest, the abandoned *hatsake* are not colonized by grasses but instead revert to forest. In the southern half of the forest *hatsake* are 5 to 20 hectares in size, and they are cultivated primarily for sale in bulk. Maize is purchased in bulk by prosperous merchants and then resold to exporters. If the Malagasy government decides to preserve the Mikea Forest, they should discourage bulk maize commerce in the region. Perhaps they should charge a tariff on maize exports, and use the money to fund reforestation projects in the Mikea Forest area. If commercial *hatsake* were brought under control, the government could allow subsistence *hatsake* and petty maize commerce (sale by cup to consumers). This would radically slow the rate of deforestation.

So far, *Eaux et Forêts*, the governmental branch that enforces bans on deforestation, has not intervened much in the Mikea Forest. The problem is that the large deforesters who

cut 5 to 20 ha *hatsake* often have legal permits to do so, while the small subsistence farmers are the ones who lack permits. I would hope that *Eaux et Forêts* will continue to treat the small subsistence farmers with understanding.

By arguing that Mikea are not ancient Vazimba that have lived in the Mikea Forest for millennia, I am definitely *not* saying that the Mikea lack historical claim to the land on which they live. The Mikea Forest had probably been home to Mikea for at least three or four centuries, which is at least as long as most other Malagasy culture groups have occupied their respective territories. By choosing to live in this dry, tough environment, the Mikea have made it their own. Those who live in the Mikea Forest today should be given legal title over their land.

Perhaps the most effective development project for the region would be simply to pave the road from Morombe to Toliara. The Mikea Forest is isolated not because of distance—Vorehe is a mere 120 km from Toliara—but because of inaccessibility. During the wet season it can take as long as a week to travel 120 km. The lack of good roads increases transaction costs dramatically, the result of which is that peasant food producers have a very limited choice of market venues. Often, Mikea and Masikoro end up selling in a market where all the sellers and all the potential buyers have similar quantities of the very same products. This happened with mangoes in November 1997 and with maize in 1999. The result is that price drops precipitously, profit margins are slim, and there is not much to purchase. This does not have to be the case in this region, for the region is characterized by considerable microclimatic variability. The products available and the timing of availability changes rapidly over a short distance. For example, mangoes ripen about a month earlier in Vorehe than they do in Toliara. With good transportation, Vorehe mango producers could earn considerable profits selling mangoes in Toliara.

The future for the Mikea is unpredictable—but then again, so is the present.