

ARTICLES

The Muduga and Kurumba of Kerala, South India and the Social Organization of Hunting and Gathering

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Abstract

This article examines the subsistence practices among the Muduga and Kurumba of Attappady in Kerala paying close attention to the socio-ecological basis of their economic activities. This facilitates an understanding of the close relationship between the distribution of natural and cultural communities, and the way in which the society is organized to reach a successful accommodation of a specific set of environmental needs. The data presented relate to wild and domesticated food products and the kin and social systems employed for obtaining them. I conclude that, although hunting and gathering alone could provide a subsistence, in a modern situation, dependence on agriculture is necessary for a 'better' and 'successful' economic system.

Introduction

Recently, several articles have appeared which consider that, for hunter-gatherers, subsistence based on foraging alone is impossible for survival in tropical rain forests (Headland 1987; Headland and Reid 1989; Headland and Bailey 1991; Bailey et al. 1989; Bailey and Headland 1991). However, there are also "strong evidences that people can live by foraging alone inrain forest and have done so in the past" (Endicott and Bellwood 1991:15; see also Brosius 1991; Bahuchet et al. 1991; Dwyer and Minnegal 1991; Stearman 1991). At the same time, it is an established fact that the cultural environments of tropical South Asian foragers – their intimate and long-term interaction with the neighboring agricultural groups – have greatly shaped their socio-economic systems (e.g., Bose 1956; Gardner 1966, 1985, 1991, 1993; Deetz 1968; Fox 1969; Morris 1977, 1982a, 1982b; Peterson 1978; Bird-David 1988, 1990; Tharakan 2003). Though engaged in hunting and gathering, these foragers combine and navigate between hunting and gathering, shifting cultivation, trade and occasional wage labor - depending on conditions and available resources - ecological parameters, technology, and relations with neighbors (cf. Tharakan 2003:323;

see also Lee and De Vore 1968; Denbow 1984; Myers 1988; Lee 1992; Bird-David 1988, 1992; Guddemi 1992). The purpose of this article is to attempt to understand the human ecology of the Muduga and Kurumba of South India, and examine the extent to which hunting and gathering is accompanied by other modes of subsistence and why.

The Muduga and Kurumba are non-intensive agriculturalists who both hunted and gathered in rain forests while frequently interacting with outsiders. Through data on the subsistence pattern and organization of the Muduga and Kurumba, this article describes the ways in which people are adapted to their natural (tropical)¹ environment and attempts to point out that their contemporary subsistence practices need to be viewed as part of a wider social system of trade, interaction and exchange, and in the context of a changing ecological system resulting from climatic changes, deforestation and restrictions imposed by forest officials, and local socio-economic interaction. Accepting the ecological constraints experienced by rain forest foragers, the paper shows that a mixed procurement system is a possible solution to the problem.

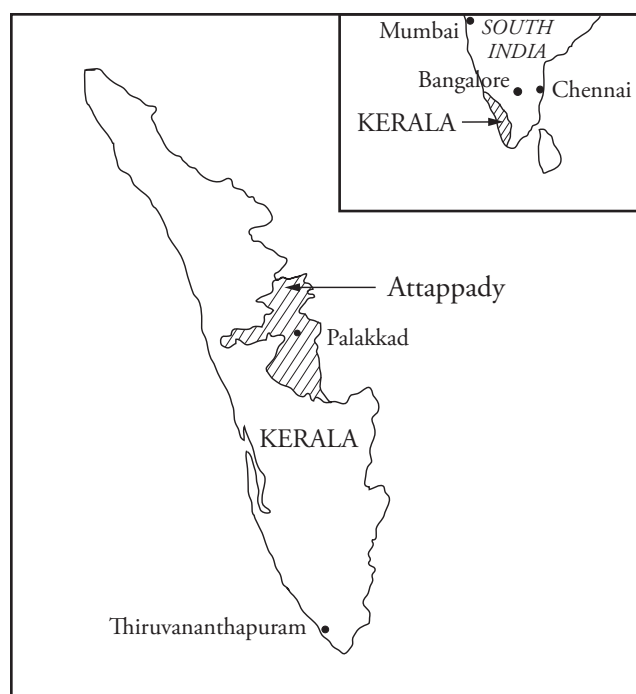


Figure 1. Location of Kerala and Attappady within southern India.

Methods

This study is based on an independent field investigation among the Muduga and Kurumba of Attappady employing mainly methods of participant observation and unstructured interviews. The data were collected in the context of a larger study on the social organization of Muduga and Kurumba. Out of the 21 Muduga hamlets, Veetiyoor, Anakkal, Thaze-Abbanoor and Mele-Abbanoor, and among the 14 Kurumba hamlets, Thadikundu, Anavai and Thaze-Thodukki were selected and household-survey was conducted for about 150 households. The villages were selected by a random sample so as to constitute 15% (around 700 members) of the total population of Muduga and Kurumba estimated to be about 4500. Data were collected in two different field trips on the sample population. The first study was conducted between March 1995 and June 1995. For a more detailed study, Thaze-Abbanoor hamlet was selected (as it represented a hamlet with almost equal number of Muduga and Kurumba co-residents) and data were collected through participant observation, interviews and case studies by living with hamlet

residents from April 1996 to December 1996, and later for a period of one month in March 1997. Observations, interviews and household-surveys were designed to elicit information on family demographics, land holdings, agricultural practices, crop varieties planted, other food procurement activities, techniques used, and division of labor.

Habitat and Settlement

The Muduga and Kurumba² (here after Muduga/Kurumba) are small tribal communities with a population of around 3000 and 1500 people respectively, inhabiting mainly the Attappady area of Palakkad district (erstwhile Palghat) in North Kerala, bordering the Nilgiri and Coimbatore districts of Tamil Nadu (Figure 1). They inhabit mostly the forest areas of southwestern slopes, uplands and foothills (extension of Nilgiri range), and the southern part of Attappady valley, with Muduga people distributed across approximately 21 hamlets and Kurumba across 14. Attappady literally means 'valley' (**padi**) of 'leeches' (**atta**). It belongs to the Mannarkad taluk of Palakkad district situated between 10° 54' and 11° 14' north latitude and 76° 27' and 76° 48' east longitude. It occupies about 250 square miles and lies behind the ridges of Western Ghats, which extend southwest to the Palghat gap (Aiyappan 1948). Attappady is one of the prominent tribal regions of Kerala with abundant vegetation and extensive forests, and most of the area has an elevation ranging from 1200 to 3000 feet. The area is tropical in climate and vegetation characterized by "moist evergreen forest of the slopes and at low elevation" (von Lengerke and Blasco 1989:52) and shrub savanna called **sholas**.³ Interior forests are purely evergreen and exceedingly moist from the first rain in April-May until the end of December, when they abound with leeches. The red loam mixed laterite soil is generally fertile. In summer, the soil is very hard and in the monsoon it is muddy and viscous. Trees of the top canopy occasionally grow to 30 to 40 meters and most of the trees are large evergreen species with dense foliage and straight trunks covered with epiphytic orchids, ferns, mosses and creepers (see von Lengerke and Blasco 1989:52-53; Poirier

1989:80-81). The secondary stratum of the forest comprises small trees with an average height of 10 to 20 meters, followed by dense shrubby stratum and a less continuous herbaceous stratum.

The annual rainfall varies from 500 mm from the Coimbatore side to 1200 to 1500 mm in the dense evergreen forest in the western and southern part of the valley (von Lengerke and Blasco 1989:28). Most rainfall is received during two monsoons—the south-west monsoon which brings most of the rain, between June and August, and the north-east monsoon in October and November. Bhavani and Siruvani are the two important rivers that drain the whole of Attappady and these rivers have all the potential for irrigating the entire area. The Muduga/Kurumba identify mainly three seasons—a ‘dry summer season’ called **kara-gali** between February and May, a ‘wet or rainy season’ called **koda-gali** between June and August, and the ‘cold winter season’ **konda-gali** from October to December (Table 1). October to January is the major harvest season and is termed according to the harvest of respective crops.

The Muduga/Kurumba ‘hamlet’ (**ooru**) is a cluster of 10 to 30 ‘huts’ (**koorai**), with 60 to 200 patrilineally related individuals. There is considerable long-term stability of group membership

and relatively long occupation of settlement. The Kurumba are mainly hunter-gatherers (Bailey et al. 1989) who also subsist on shifting cultivation on hill slopes. Though the Muduga and Kurumba inhabit different habitats, there is no consequential ecological difference in environment, and they share and exploit the same forest biomass and similar ecosystem within the Attappady forest. The two tribal groups are similar in many respects in spite of speaking different dialects, and they intermarry and are bound together in socio-cultural mutualism that is quite ancient (Kapp 1989). Both Muduga and Kurumba exhibit features such as close residence to and trade relation with agricultural communities, as well as very specialized exploitation and inhabitation in secondary forest, both common to the hunter-gatherer groups of India (Bailey et al. 1989:63).

Muduga/Kurumba huts are relatively small and constructed using simple materials like bamboo and strong vines or bark strips for tying the poles and rafters. A hut typically consists of one living room, which is also the place where cooking is done. Every hut has a rectangular earthen base with a ‘linear front porch’ (**deetti**). Huts of close kin are erected in linear rows attached to one another with a ‘long

Table 1. Seasonal variation and climatic conditions.

Period	Months	Climatic conditions	Temperature
Dry Season	Late February	Moderately warm	30 – 32°C
	March - May	Hot	33 – 35°C
	Late May	Summer showers	--
Wet season	Early June	Rain begins	27° C
	July - August	Rain	--
	September	Pleasantly mild	29°C
Cold season	October	Rain begins	25°C
	Mid October – December	Rain and fog (very cold)	20°C
	Mid December – January	Moderately cold	--

single joined porch' (**ottideetti**). The sloping roof structure is built of split bamboo rafters tied with vines overlying the cross poles. **Darba** grass (*Poa cynosuroides*) is arranged on top to make a rainproof roof. The walls are made of split bamboo interwoven like basket work and plastered on the inside with clay. The floor is neatly plastered with a mixture of cow dung and clay and is cobbled with water-worn pebbles. The interior of the hut is divided into two roughly equal parts, **vettara**, a more secular space towards the entrance, and **ullara**, a more sacred space near the fire place where large slow burning logs are kept during cold winter nights.

The Muduga/Kurumba economy

The Muduga/Kurumba economies are a flexible mixture of activities, like most indigenous societies (Butt 1977), mainly depending on shifting cultivation supplemented by hunting, gathering, collection and trade of forest produce and, at times, working as wage laborers for outsiders (Tharakan 2003). This situation can be seen as one of opportunistic changes in subsistence strategies evidencing changing conceptions of the problem of making a living in the forest, especially in regard to limited carbohydrate resources and relations between foragers and non-hunter-gatherers.

Table 2. Species of wild plants used by Muduga and Kurumba.

Muduga name	Botanical name	Parts used
uluma	<i>Grewia latifolia</i>	timber, fruit
beetti	<i>Dalbergia latifolia</i>	timber
tanni	<i>Terminalia bellerica</i>	timber
athi	<i>Ficus glomerata</i>	fruit
beppu	<i>Azadirachta indica</i>	leaf
karampa	<i>Murraya koenigii</i>	leaf
sakke	<i>Artocarpus heterophylla</i>	fruit, timber
mave	<i>Mangifera indica</i>	fruit
tonda	<i>Ricinus communis</i>	seed
muduga tonda	<i>Jatropha curcas</i>	seed
njaval	<i>Syzygium cumini</i>	fruit
eenthu	<i>Cycas circinninalis</i>	fruit
kattu keera	<i>Amaranthus gangeticus</i>	leaves
kanka	<i>Solanum nigrum</i>	leaves
jeenimula	<i>Capsicum frutescens</i>	fruit
moonka	<i>Dendrocalamus strictus</i>	woody stem
oda	<i>Ochlandra travancorica</i>	woody stem
bethu kodi	<i>Calamus rotang</i>	stem
kavari	<i>Helicteres isora</i>	timber
kalamaru	<i>Sida rhombifolia</i>	root and twigs
churula	<i>Tragia involucrata</i>	timber

Table 3. Edible roots and tubers from the wild.

Muduga/Kurumba term	Common name	Scientific name
noora kilangu	root	<i>Dioscorea pentaphylla</i>
savel kilangu	thorny yam	<i>Dioscorea tomentosa</i>
sole kilangu	yam	<i>Dioscorea</i> sp.
perikku kilangu	yam	<i>Dioscorea</i> sp.
ere kilangu	yam	<i>Dioscorea</i> sp.
kavala kilangu	yam	<i>Dioscorea</i> sp.
karinkodi kilangu	yam	<i>Dioscorea</i> sp.
majava kilangu	yam	<i>Dioscorea</i> sp.
kattu kilangu	Indian kales	<i>Colocasia antiquorum</i>

Gathering

Gathering in the forest is of great importance both as a means of obtaining food and also as a source of raw materials. Major plant foods include tubers, edible roots, mushrooms, leaves, berries, nuts, seeds and seasonal fruits (Table 2). A considerable portion of the diet comes from roots, tubers, yams and green leaves. Food is widespread in the Muduga/Kurumba environment and within the forest food occurs in scattered concentration. Wild tubers are available throughout the year, although the rate of return in terms of weight (or biomass) varies. However, it is noted that, *Dioscorea* yams and other tuberous plants in tropical rain forest usually possess fleshy tubers and their nutrient content will not vary much in spite of marked seasonality in rain (see also Bahuchet et al. 1991; Hladik et al. 1984). The edible roots and tubers collected by Muduga/Kurumba are given in Table 3. Starch derived from the powdered nuts of cycas palm has traditionally been one of the primary sources of carbohydrates for Muduga/Kurumba. It is found in steep ridges and slopes, where it grows interspersed with other vegetation. Mushrooms found in limited quantities are considered a delicacy and picked during the rainy season (June to August). They identify about eight varieties of edible mushrooms.

More important in their diet are a number of spinach-like greens, especially amaranth (**keere**) and

solanum (**kanke**) which grow as weeds in the fields. They often use them as relish for the main food. They think little of their taste or nutritive value, but probably these green leaves do contribute to their diet certain elements, such as vitamin C, without which it would be deficient.

Medicinal herbs and roots, dry fruits, honey, bees wax, resin, bamboo and timber are forest products collected mainly for trade in the market or for supply to the government cooperative society (Table 4). Honey is available more in the dry season than at any other time mainly because bees store large amounts of honey at this time in preparation for scarcities during the rainy season (Kempff Mercado 1980). At times, insects are a food source and people eat bee honey comb along with their eggs, and also eat ant-flies as reported for the Paliyan (Gardner 1993), Kayupa (Posey 1981), Yanomamo (Smole 1976) and Yukpa (Ruddle 1973). The Muduga/Kurumba identify four varieties of honey bees:

Kolen (*Melipona iridipennis*), a 3.5 mm, small, harmless bee

Komban (*Apis florae*), a 8 mm, long, small, honey bee

Toduti (*Apis indicus*), a 12 mm, long, forest bee

Karinten (*Apis dorsata*), a large, rock bee

Table 4. Minor forest products collected by Muduga and Kurumba for Kurumba cooperative society.

Muduga name	Common name	Scientific name	Parts used
ten	honey		
mekku	bees wax		
tumma	black dammar	<i>Cannarium strictum</i>	resin
urinchikka	soap nut	<i>Sapindus Laurifolius</i>	fruit
kadukka		<i>Terminalia chebula</i>	fruit
kattutippili		<i>Piper longum</i>	root
padaberu		<i>Cyclea peltata</i>	root
amalpori		<i>Ophiorrhiza mungor</i>	root, fruit
kudampuli	cocum	<i>Garcinia cambogia</i>	fruit
karinkurinji		<i>Strobilanthes ciliates</i>	root, fruit
nannari		<i>Hemidesmus indicus</i>	root
nellikka	gooseberry	<i>Emblica officinalis</i>	fruit
kattu kurumula	black pepper	<i>Piper nigrum</i>	fruit
chunda		<i>Solanum torvum</i>	root
muvila		<i>Pseudarthira viscid</i>	root
kalamaru		<i>Sida shombigolia</i>	root
orila		<i>Desmodium gangoticum</i>	root
cherutekku		<i>Clerodendron serratum</i>	root
puli	tamarind	<i>Tamarindus indica</i>	fruit

Gathering and collecting is done both by men and women, although it is mainly a women's activity. Except for occasional fishing the role of men is minimal and restricted, limited primarily to participation alongside women and children. The only tool used for collecting roots and tubers is the digging stick (**bajji**), made out of the small branches of trees especially **kauri** (*Helicteres isora*) sharpened at one end and stripped of bark. The ease of digging the tubers varies according to the season. During a dry period, the ground may get fairly hard, which accounts for the low return.

Men mainly engage in the collection of forest products like bamboo, reed, grass, vines and wood, which are used to construct huts and manufacture household items like baskets, containers, brooms

and tools. Collection of honey is done only by men who are highly skilled in activities such as climbing big trees, driving away the bees, and also tracing the bees and locating the honey comb in the thick forest. Men usually go in pairs, especially with their brother-in-law for these activities.

Fishing is done in small groups consisting of women and children mostly during rainy season when the river overflows and fills the nearby fields and plains. Small fishes and crabs are an alternative or complementary source of protein. All species of fish are collected, although men devote much less time and energy to fishing than they do to hunting. Fishing techniques include use of small nets, basket traps, hooks, bombs and poisoning. At certain times, particularly during the rainy season when no other agriculture work is

possible, the entire family goes into the forest in search of produce. They combine foraging (hunting, digging wild tubers and gathering wild fruits and vegetables) with collection of minor forest produce, especially medicinal roots like **pada beru** (*Cyclea peltata*) primarily for cooperative societies in return for rice, sugar, cooking oil, kerosene, clothes tobacco etc., and also for trade with non-tribal tradesmen.

Hunting

The other major component of the Muduga/Kurumba diet is the meat and fat provided by hunting. The hunting territory can be divided mainly into two types: a) the farmland (**kadu**) surrounding the hamlet where they occasionally trap small animals like rabbits, mongoose, large bush rats, wild fowls and few other varieties of small birds and b) forest (**sole**) where they hunt animals such as wild boar, deer and antelope. Hunting is mostly a male activity where groups of men, both agnates and affines, gather together and proceed into the forest in search of game for one or two days.

The strategies and tactics adopted by the Muduga/Kurumba are diverse. Though they employ several methods of hunting, the most common is hunting with homemade rifles, assisted by dogs. Traditionally, the hunting of animals was by trapping and did not include the use of bow and arrow. In addition, they construct a variety of traps like **binjivan** and **katari**, snares like **kudukku** or **kanni**, and nets (**bale**) to catch small animals. The farmland surrounding the hamlet is cluttered by various traps. Sets of traps are built and maintained by one or two individuals, and thus require no collective activity. The game selection is broad, and animals most frequently hunted for meat (**kari**) are those that are plentiful or relatively easy to find and shoot or trap, and whose meat is generally desirable.

The game preferred by Muduga and Kurumba over all others is wild boar (**kattu panti**- *Sus scrofa cristatus*). This, according to them, is due to the large amount of meat they provide, and high fat content. It is also by far the most common type of game procured. Table 5 presents the different types of game

Table 5. Animals hunted by Muduga and Kurumba.

Muduga name	Common name	Scientific name
ma	sambar deer	<i>Rusa unicolor</i>
koorama	mouse deer	<i>Tragulus meminna</i>
kelama	barking deer	<i>Muntiacus muntjak</i>
pullima	spotted deer	<i>Axis axis</i>
baradu	nilgiri tahr	<i>Hemitragus hylocrius</i>
belilu	flying squirrel	<i>Petaurista philippensis</i>
eyyan	porcupine	<i>Hystrix leucura</i>
keeri	mongoose	<i>Herpestes edwardsi</i>
alinku	scaly anteater	<i>Manis erassicaudata</i>
utumbu	monitor lizard	<i>Varanus bengalensis</i>
mijalu	rabbit	<i>Lepus nigricollis</i>
pokken	jungle cat	<i>Felis chaus</i>
kattu koli	jungle fowl	<i>Gallus gallus</i>

consumed by Muduga/Kurumba. Hunting is done year round and they resort to hunting and trapping on an average of once a week. Analysis of hunting returns between April 1996 to March 1997 (excepting December 1996) at Thaze-Abbanoor hamlet shows that Muduga/Kurumba on average consumed less than 20 grams of animal protein a day per person (this amount is slightly more among those inhabiting the interior forest).

The Muduga/Kurumba do not usually hunt in large groups. The number of men in a hunting group usually varies from two to six. Even when a group of six men hunt together, they do not use collective techniques such as driving or surrounding the game. Men proceed into the forest in the evening along with provisions of rice, red-gram, tea-powder, sugar and salt for consumption during their stay. Sometimes, they depend on wild fruits and tubers or on small animals and birds. Once they enter the forest they move with extreme patience and silence. Hunters

communicate only through whistling sounds. They do not usually spend more than a day in the forest and always intend to return to the hamlet by dawn. During the night they hunt with the help of powerful head lights with which they can easily notice the movements of animals and identify them from their glazing eyes. The shape and the distance between the eyes help them identify game.

The game is shared equally among all those who participate in the hunt and if the game is sizable a share is given to all other households in the hamlet. Apart from the normal share, the inner meat (i.e., heart and liver) and a thigh go to the person who shot the animal. A small portion of the inner meat is offered to the hamlet's ancestral spirit (**pattan**) and to the spirit in whose name he has used the weapon (**arivu**) (e.g., see Brown 1984; Carneiro 1970). The animal is carried to a suitable place, usually close to a stream not far away from the hamlet, where the butchering or slaughtering takes place.

Table 6. Composition of hunting groups at Thaze-Abbanoor (G^+ and G^- represent ascending and descending generations).

Kin categorial composition of hunting group	Frequency
Brothers	6
Ego; affine – G^0 (2 members)	11
Brothers; affines – G^0	12
Brothers; agnates – G^{-1} ; agnates – G^{-2} ; affines – G^0	2
Brothers; non-agnates (affine's affine – G^1 , affines – G^0)	1
Brothers; affine – G^{+1} , affines – G^{-1}	1
Brothers; affine – G^{-1} , affines – G^{-2}	2
Brothers; affines – G^{+1} , affines – G^0	1
Brothers; agnates – G^{+1}	1
Ego; agnates – G^{-1} , affines – G^{-1}	2
Ego; affines – G^{-1} , affines – G^{+1}	1
Ego; agnates – G^{-1}	3
Ego; wife	2

Social organization of hunting

Among the Muduga/Kurumba it is the corporate group, the clan, which owns the land and has primary rights over its plant and animal resources. However, people from other groups and hamlets are never restricted from hunting and gathering in the clan's territory. The kin composition of 45 hunting groups observed at Thaze-Abbanoor hamlet at different times between 1996 March to 1997 March (excepting 1996 December) shows that only 10 groups were composed of agnates alone. Groups that consisted of brothers alone were six and those which consisted of two brothers-in-law were 11. At times, hunting groups were also composed of husband and wife (Table 6). Further, kin composition shows that the sharing of labor and cooperation in economic activities are not restricted to the household or the close agnatic circle, but also includes closely related affines residing in the hamlet thereby reducing the occurrence of economic units strictly on descent line.

Sharing and food exchange among the Muduga/Kurumba is a highly institutionalized daily

activity. It is necessary that those who obtain game share with those who did not. The Muduga/Kurumba believe that even small game should be shared among all members of the hamlet so as to avoid the craving (**daham**) they feel for meat. However, small game is often shared only among the members of the hunting party and their close kin. Large game animals are always widely shared. In such cases, the unit of sharing widens to include more relatives other than the regular food-sharers (**beetekarar**).⁴ In one case at Thaze-Abbanoor, when Panali⁵ got a wild deer, he shared the meat with a wider kin circle. The sharers of the meat included households of his regular **beetekarar** such as his elder brothers Kaden and Velli, his mother Regi, his elder brother's son Ramaswami and his sister Vellachi in addition to the households of his classificatory brothers Kali and Chiriyen, classificatory sister, his elder sister's son and his mother's brother. Figure 2 shows the genealogical composition of Panali's sharing unit. When they have excess meat, it is dried and preserved.

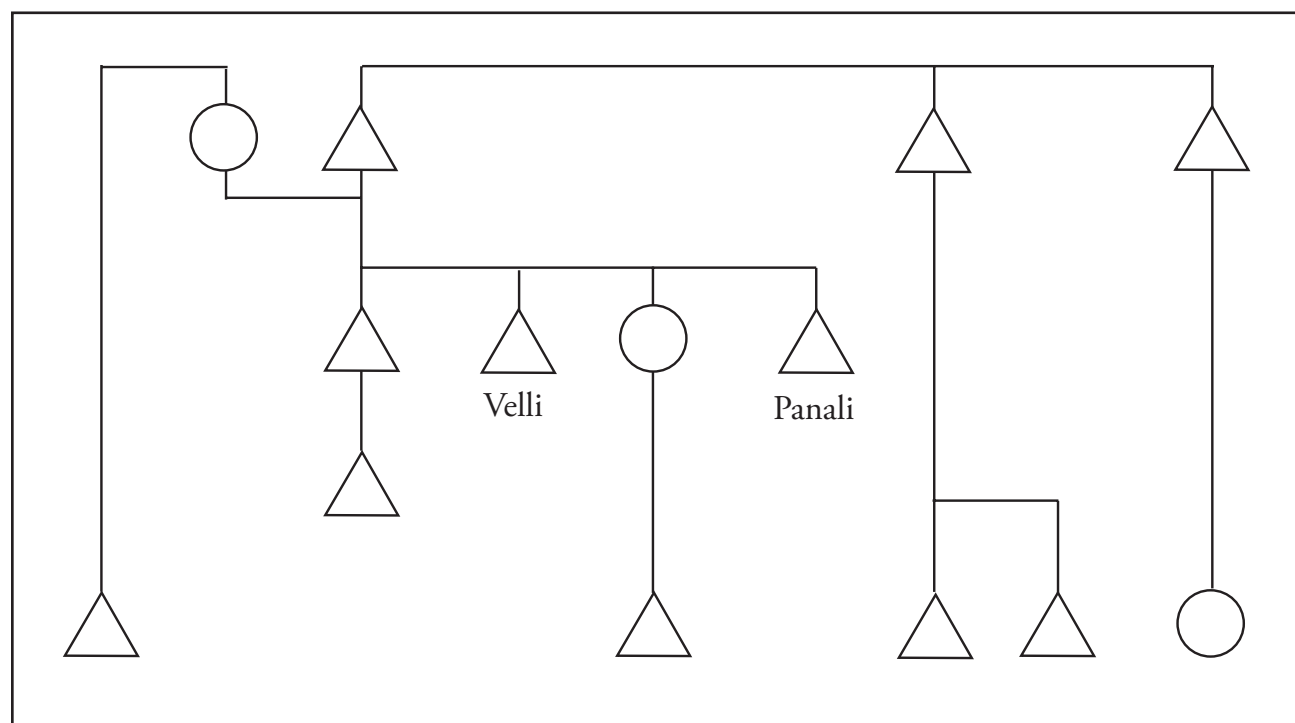


Figure 2. Genealogical composition of Panali's sharing unit.

A clear understanding of the nature of Muduga/Kurumba sharing reveals the meaningful correlation between their hunting and agricultural system, such that as Dwyer and Minnegal (1991:210) point out, “the former necessitated sharing, the latter had been accommodated to a prior ethos of sharing.” During rest periods or at night, hunting stories are related and each day’s experience and expedition in the forest is shared within the group. Since, in a hamlet, almost all are related either as agnates or affines, and a strong notion of sharing exists among them (Tharakan 2003), there is no advantage in keeping food source information from one’s peers. “This constant sharing of information further contributed to effective resource use in that those items noted but left unexploited by one foraging party could be utilized by another” (Bahuchet et al. 1991:253). There are no major sanctions associated with hunting performance and all persons are free to hunt anywhere at any time. Nevertheless, there are minor sanctions such that, if the wife is under ‘pollution’—especially menstrual—the husband is subject to prohibition from hunting. Similarly, women who are in their late pregnancy stage or in their early lactating period are subject to dietary restrictions such as avoiding meat and depending more on food made of millet and tamarind. Faunal taboos such as restraint from hunting animals when they are drinking water, mating, feeding young ones or when they are physically weak do exist, and these taboos may serve a practical function in regulating predation and allowing game population growth.

The Muduga/Kurumba, like their neighboring caste groups, manage to raise smaller livestock like goats and cattle. Almost all the households rear dogs and chickens. Other than the animal protein from chicken eggs and the occasional goat and chicken they slaughter, the Muduga/Kurumba largely look to hunting and fishing to provide them with the animal protein they need. With the exception of a few kinds of creatures like frogs, snakes, monkeys, jackals and dogs, any animal is regarded as edible by them. Thus, as Dwyer and Minnegal (1991:192-204) observed for the Kubo, the success of Muduga/Kurumba hunting depends

on various components of its organization such as broadly based prey selection, diverse strategies, role specialization, sharing of meat, and absence of major sanctions associated with hunting.

Shifting cultivation

Though the Muduga/Kurumba resort to hunting and gathering, these activities never override or interfere with shifting cultivation, their primary source of food. Although food is widespread in the Muduga/Kurumba environment, as Headland (1987) and Bailey et al. (1989) claim, such foods are seasonal, insufficient and have high production cost. Land is abundant and one can cultivate any extent of land according to his or her capacity; thus, agricultural produce is the major source of carbohydrates. The method of cultivation by clearing and burning fresh field is **karikadu krishi** (‘burnt field-cultivation’), and the usage of previously cultivated plot is **pakkakadu krishi** (‘old field-cultivation’). Ownership of land is collective, in the sense that all the patrilineal descendants of the founding ancestor are the joint owners of the hamlet and its territory. Figure 3 shows the diagrammatic representation of Muduga/Kurumba hamlet and its territory. Thus, the descent group has the greatest right over the land which is controlled by the hamlet’s council of elders.

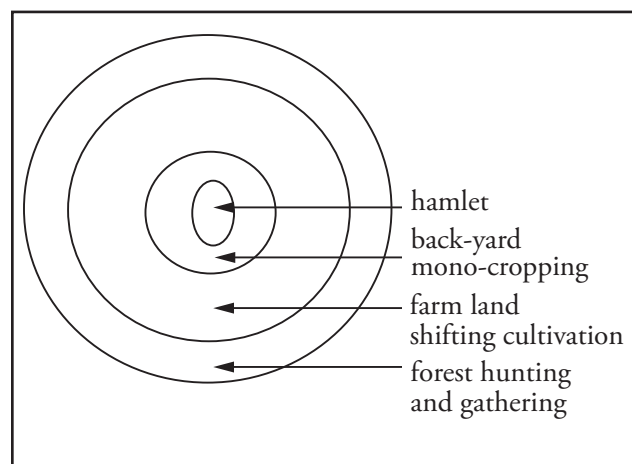


Figure 3. Diagrammatic representation of hamlet and its surrounding territory.

Table 7. Plant species cultivated as mixed crop in swidden.

Muduga name	Common name	Scientific name
rai/kora	finger millet	<i>Eleusine corocana</i>
same	little millet	<i>Panicum miliaceum</i>
tuvari	red gram	<i>Cajanus cajan</i>
kaduku	mustard	<i>Brassica nigra</i>
keera	amaranth	<i>Amaranth hypochondriacs</i>
sakkare	cucumber	<i>Cucumis sativus</i>
amara	bean	<i>Phaseolus vulgaris</i>
payar	cow-pea	<i>Vigna sinensis</i>

Regarding the right to land, it is not the absolute freedom of the individual or the family that matters, but the consent of the council members—especially the ‘headman’ (**moopan**) of the hamlet. Close affines, when in need, may come and reside along with their wife’s father, wife’s brother or maternal kin, and cultivate a portion of their land. In some cases daughters use their father’s land throughout their lifetime. Nevertheless, the above should not be taken to conclude that these are amorphous units with fluid composition and vague social boundaries. The Muduga/Kurumba represent a transition between forager and cultivator exhibiting features of both social organizations. Though they are patrilineal by descent, the system shows bilateral tendencies of a flexible and loosely structured system. This shift from a complete forager to that of a forager-grower is reflected in the change from the use of land as a ‘subject of labor’ which fosters an immediate-return system allowing a process of sharing representing an egalitarian type, towards use of land as an instrument of labor resulting in a delayed-return system. Development of cultivation implies control over both land and people leading to more structured forms with family and lineage as productive units (see Marx

1970; Meillassoux 1972, 1973). The forager-farmer subsistence pattern is not a mere transition state between two ways of life, “[r]ather, it is an adaptation to certain environments in which it arises and persists, and the people who exhibit this adaptation share many features of subsistence style with societies described as hunter-gatherers or foragers” (Tharakan 2003:332).

The entire membership of the hamlet prefers to cultivate in the same area and they shift from one area to another collectively. They usually cultivate an area for 2-3 years and the fallow period may be around 8-12 years, which is sufficient for the forest recovery.⁵ Swidden are an adaptive subsistence economy in tropical forest environment as long as population density is low and sufficient land is available for active cultivation and shifting from one area to another (see Janzen 1975; Meggers 1971; Hames 1983). First year gardens, newly cleared from the forest, have a higher level of fertility than second or third year gardens, since their burning returns nutrients to the soil. Moreover, as Flowers et al. (1982:205) note, “high biomass, higher level of fertility, soil moisture, and sufficient organic matter in the soil are the conditions suitable for slash-and-burn agriculture.”

Table 8. Plant species cultivated as single crop.

Muduga name	Common name	Scientific name
kundu cholam	maize	<i>Zea sp.</i>
makka cholam	sorghum	<i>Sorghum bicolor</i>
poola	manioc (tapioca)	<i>Manihot utilisima</i>
baga	plantain	<i>Musa sapientum</i>
nellu	rice	<i>Oryza sativum</i>
paruthi	cotton	<i>Gossypium barbadense</i>
semp	taro	<i>Colocasia esculenta</i>

Predominant crops cultivated by them are finger millet, little millet and red gram. Also grown in small quantities are amaranth, bean, cow-pea, mustard and several varieties of cucumber (Table 7). The planting pattern involves poly-culture or mixed cropping (simultaneously planted crops with no row arrangements or distinct zonation of crops).⁷ Since often there is a single predominant crop, their swidden can be said to be a 'millet field' or a red-gram field (see also Conklin 1954). Though this "helter-skelter" planting of crops of different varieties and heights does not necessarily result in a "canny imitation" of the tropical forest as Geertz (1969:14, 7) and others (Beckerman 1983a, 1983b) opine, it nevertheless helps in protecting the soil from leaching by heavy rains and limits weed growth and nutrient loss due to heat by partially shading the ground (see Flowers et al 1982). Cotton, maize, dry-land rice etc., are planted as a single crop in separate gardens (Table 8). Small quantities of taro, yam, banana, sorghum, tapioca and maize are grown near their huts. These backyard plantings often are a source of emergency rations.

In shifting cultivation, household members cooperate with one another in almost all its phases from clearing the trees and bushes till the harvest. Certain activities in the cultivation process however are sex-linked and need special skills. Table 9 shows the various seasonal activities involved in shifting

cultivation. Men are responsible for clearing the early set of fields and the women are responsible for most of the subsequent care of the fields, though men and women may assist. Clearing of fields (**kadu saveral**) involves cutting small trees, clearing bushes and shrubs, and collecting branches and twigs into piles for burning when they are dry. This is done at the onset of summer, usually by mid-February or early March. The major part of shifting 'cultivation' (**kadu pani**), such as cutting furrows in the soil, sowing (**kethal**), weeding and harvesting are done mainly by women. Normally women of closely related households (**beethekarar**) collect together for these activities, especially weeding and harvesting. At Thaze-Abbanoor, Ramanan's⁸ family has close interaction with his brother Chitambaran's and sister Maruti's households who are his **beethekarar**. For almost all economic activities, these three households function as a single unit. However, at times, when the labor required is more, the corporate unit widens so as to include more members belonging to a second order relation with regard to kinship and degree of day to day interaction. These include households of Ramanan's sister Mati residing away from the hamlet (with whom there is little daily interaction), classificatory brother Veeran and his brother-in-law's sister. Figure 4 shows genealogical composition of Ramanan's corporate economic unit.

Activities	Seasons
Slashing/clearing	mid February to early March
Burning	end March
Setting the fields	mid April
Summer rains	mid April-May
Ploughing/sowing	end April-early May
Monsoon rains	end May-early June-August
First weeding	August
Harvest of amaranth, mustard, cucumber leaves	August
Watching	August-October
Rai harvest (harvesting of mustard seeds)	September-October
Same harvest	November-December
Tuvari harvest	January

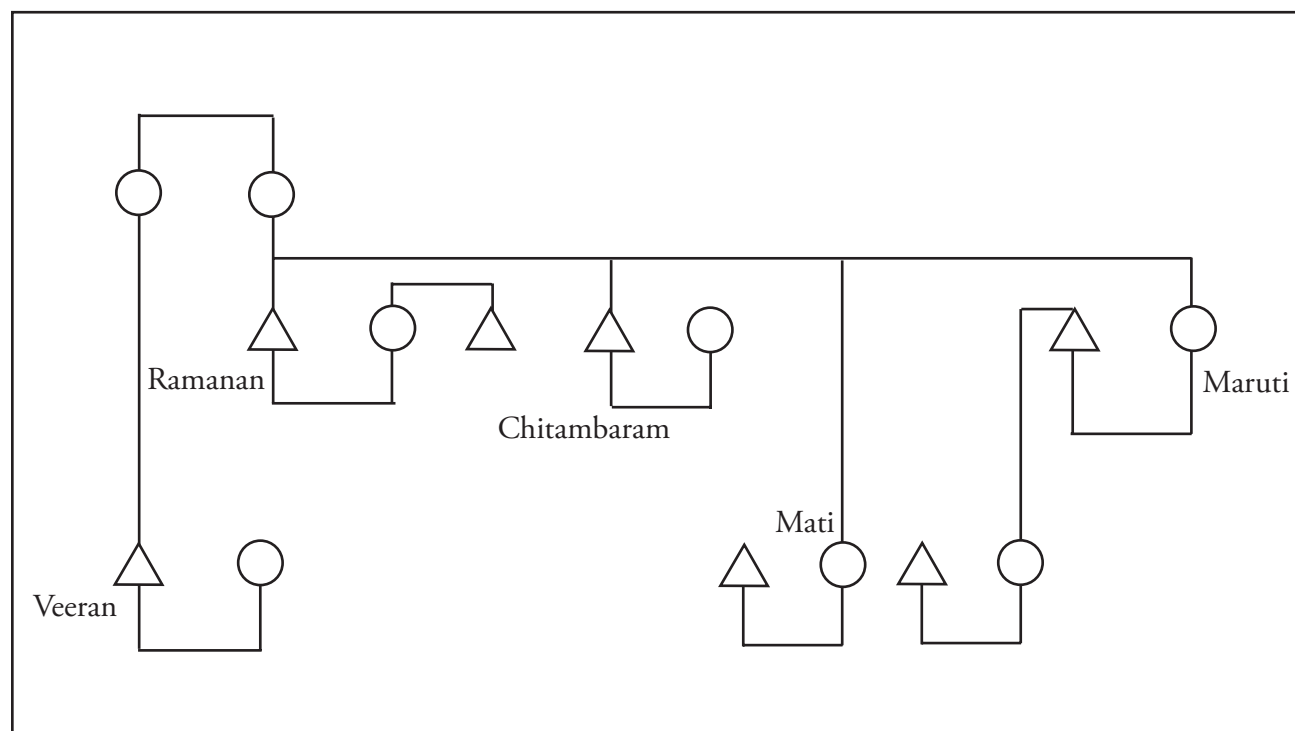


Figure 4. Genealogical composition of Ramanan's economic unit.

Since clearing is tedious work and needs more labor, most fields are cleared communally with the help of kinsmen or **beethekarar**. However, sowing seeds in prepared fields are done by individual families. Red gram (**tuvari**) seeds are sown in shallow holes dug with sticks. Three holes spaced three inches apart in a triangle form a unit, and the units are spaced at an average distance of three feet apart. After a week, when the red gram seedlings are about 4-6 inches in height, the other seeds (finger millet, little millet, mustard and amaranth) are mixed together and scattered helter-skelter in the field. This is called **kora-same kethal**. **Kora** and **same** seeds are mixed in a ratio of 6:1 liters per acre along with a handful of mustard and amaranth seed. Then they cut furrows in the soil, turning it over with a hoe (**kothu**) so that the seeds sown are covered by soil. **Amara** ('pea') is also sown simultaneously so that the creepers can climb on to the red gram plant and grow. Occasionally the tall shrubs which grow among the **tuvari** ('red gram') crop are slashed down by men. Hoes (**kothu** or **kuntali**) with narrow blades or hook shaped branches of small trees are the most frequently used implements in soil preparation which is done mainly by women. Small sickles (**kora-kathi**) are used for harvesting. Men use knives (**kathi**) for slashing and cutting of shrubs and trees.

They weed the garden twice during the growing period. The first weeding is done after 1.5-2 months, during **Adi** month (July- August), when the crops are about one foot tall. Here, with relatively little expenditure of labor, they raise crops that are suitable for their needs in their swidden. Thus swidden are anthropogenic, created and maintained by humans through the manipulation of limiting factors and with the input of energy and nutrients (see also Janzen 1975; Loucks 1977). When the crops are mature and ready to produce the yield, men engage in watching the farm. They erect small 'watch-huts' (**kava-sala**) and spend their nights in the fields guarding the crops from birds and wild animals. Sometimes the entire family shifts residence to the field so as to spend more time in taking care of the crops and return once the harvest is over. Nevertheless, in both cases, it is the men who are mainly involved in the duty of watching the fields. Close kin tend to

cultivate in adjacent fields, which enables them to assist one another and to share the labor in watching, and also to protect the fields from the effect of 'garden magic' (**panti odi**) (also see Brown and van Bolt 1980). Special dietary restrictions, like the taboo against eating the crops (cultivated as well as wild) are imposed on the people until the corn has sprouted and its harvest ritual (**todu**) is held.

Discussion and conclusions

It is noted that tropical forests have the highest biomass, productivity and species diversity of any terrestrial ecosystem (see Longman and Jenik 1974; Mabberley 1983). However, according to Bailey et al. (1989:61), "animals in tropical rain forests are unlikely to be adequate substitutes for carbohydrates as sources for calories." They argue that tropical forests are starch poor and wild foods are very rare and scarce (access to calories and protein is limited), and human foragers are unable to live in tropical forests without access to domesticated plants and animals (Headland 1987; Bailey et al. 1989; Hutterer 1983; Meggers 1973; Sponsel 1986; Milton 1984).⁹ It is also noted that although floral and faunal species diversity is high, within a species, population density is low and distribution of individuals is patchy (Richards 1973; Eisenberg 1984). Be that as it may, indigenous societies are often considered affluent (Bergman 1980; Johnson 1978). This consideration is mainly because of their traditional knowledge base (Posey 1982) and their skill in exploiting resources from their ecosystem using appropriate technology (Kamen-Kaye 1977; Lizot 1972) with a goal of acquiring sufficient supplies "even though resources may not be readily accessible" (Sponsel 1986). Thus, culture adapts a particular population to its ecosystem, such that the system or organization plays an "important role in acquisition, processing distribution of and consumption of food and other resources" (Sponsel 1986) promoting the survival of the group (see also Henry 1951; Siskind 1978; Urbina and Heinen 1982). Moreover, when Colinvaux and Bush in a critical note emphasized high productivity and high diversity as the essential properties commonly associated with the tropical rain forest (1991:153),

Bailey et al. readily accepted it, nevertheless, shifting the question to “the exploitation of the forest’s abundance resources” by foragers (1991:161), which they themselves had highlighted as the major feature of India’s hunter-gatherers (1989:63).

Studies on tropical forest hunter-gatherers provide valuable evidence on changing conceptions of the problems associated with making a living in the forest (Bailey and DeVore 1989; Endicott and Bellwood 1991; Griffin 1984; Hawkers et al. 1982; Milton 1984) and the complex relation between foragers and non hunter-gatherers (Bahuchet and Guillaume 1982; Bird-David 1988; Gardner 1985, 1993; Morris 1982a, 1982b, 1982c; Griffin 1984; Hoffman 1986). Rich forest resources and Muduga/Kurumba subsistence patterns show the rich possibilities of subsisting by foraging. However, it is not easy to live by foraging alone in tropical rain forests as argued by Headland (1987) and Bailey et al. (1989), given the numerous virtues of cultivated food and the increased interaction with food-producing communities. Yet, there is little reason to believe that the Muduga/Kurumba were foragers who only recently adapted to cultivation. A better solution to these difficulties is to “connect hunting and gathering of wild resources with agriculture either directly (where the people practice non intensive agriculture), or indirectly, where the people trade with neighboring farmers for agricultural produce” (Dwyer and Minnegal 1991:188; see also Fox 1969; Gardner 1966, 1985 1991; Kent 1989; Morris 1977, 1982a, 1982b, 1982c; Sponsel 1989). The internal orderings of their social systems are functionally related to their being an enclave in a food-producing society (Bird-David 1982; Gardner 1966; Morsko 1987). Thus it is not the exploitation of wild resources alone, but, the social principle of collective appropriation of resources depicted in the concept of sharing (Ingold 1987) that is characteristic to hunting-gathering. Similarly, norms of reciprocity among these settled hunter-gatherers is a form of risk insurance prevailing under particular economic situations (Cashdan 1985), and owe value and significance in the context of the particular sort of social relation for their own sake (Bird-David 1982).

Though wild plant foods are gathered by the Muduga/Kurumba, it is significant to mention here that their availability is seasonal and irregular and hence are a less important and poor substitute for agricultural produce as energy suppliers in the diet (see also Hart and Hart 1986). The Muduga/Kurumba way of life is to live in settled homesteads and make fields on which to depend for sustenance, and to supplement this living with the expectedly scarce and irregular products of hunting and gathering. As Gardner opines “[f]oraging offers not a truncated or barely remembered way of living, but a rich, ongoing set of practices” (1993:134). Thus components of hunting and gathering exist in combination with shifting cultivation for *better* subsistence. These combinations provide them adequate levels of carbohydrates and protein.

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Notes

¹ Bailey defines tropical rainforest as evergreen or mixed evergreen and deciduous forest lying within the tropics (roughly between 23° 27' N. lat. and 23° 27' S. lat.), with minimum temperatures not falling below freezing, and with a mean annual rainfall greater than 1000 mm. However, Headland's (1987:464-65; 1988) definition restricts tropical rainforest to evergreen with distributed rainfall of at least 4000 mm/year excluding seasonal semi deciduous Southeast Asian monsoon forest (cf. Headland and Bailey 1991:119). With South India, however, we are dealing mainly with yam-rich monsoon forest, not strictly rain forest (see also Gardner 1993:109).

² According to Kapp and others, Kurumba is a collective term for the tribal complex constituting of seven groups: Betta Kurumba, Jenu Kurumba, Mullu Kurumba, Urali Kurumba, Alu Kurumba, Palu Kurumba and the Muduga, differing in language, culture and religious beliefs (Kapp 1985; Kapp and Hockings 1989; see also Tharakan 2003:323). The Kurumba inhabiting Attappady area are the Palu Kurumba. However, the term Palu Kurumba is seldom used and instead they are often referred to as 'Attappady Kurumba'. Similarly the Alu Kurumba are often referred to as 'Nilgiri Kurumba'. Moreover, I hesitate to combine both Muduga and Kurumba under a common term 'Kurumba' since they represent two distinct social groups though having similar customs and habits.

³ Shola is a sloping strip of evergreen forest composed of medium sized and small trees and surrounded by large tracts of grass and savanna with a narrow water course running through it (see von Lengerke 1989).

⁴ **Beethekarar** are closely related kin (agnates as well as affines) who tend to reside close by and engage in a regular exchange of food and service (see Tharakan 2003).

⁵ Panali (real name) aged 32 years is the son of Mullan of *Manjipattan* clan at Thaze-Abbanoor hamlet.

⁶ At Thaze-Abbanoor there are about six separate areas for shifting cultivation. They are **beettidotta kadu**, **ellakara kadu**, **nelliara kadu**, **toonkramale kadu**, **tuvakadavu kare**, **vagasole kadu**.

⁷ In this type of cropping, two or more crops are grown simultaneously and intermingled with no arrangements (Hames 1983:17; Ruthenberg 1971), and this is a wide spread characteristic of native tropical forest (Geertz 1970; Igbozurike 1971; Kass 1978; Meggers 1971).

⁸ Ramanan (real name) aged 35 years is the son of Kuppan of *Manjipattan* clan at Thaze-Abbanoor hamlet.

⁹ The 'isolationist' view of contemporary hunter-gatherer societies had been questioned several times (see Leacock and Lee 1982; Schrire 1984).

References Cited

- AIYAPPAN, A.
1948 *Reports on the socio-economic conditions of the aboriginal tribes of the province of Malabar*. Madras: Madras Government Press.
- BAHUCHET, S., AND H. GUILLAUME.
1982 "Aka-farmer relations in the northwest Congo basin," in *Politics and history in band societies*. Edited by E. Leacock and R. Lee, pp. 189-211. Cambridge: Cambridge University Press.
- BAHUCHET, S., D. McKEY, AND I. DEGARINE.
1991 Wild yams revisited: Is independence from agriculture possible for rain forest hunter-gatherers? *Human Ecology* 19:213-243.
- BAILEY, R.C., AND I. DEVORE.
1989 Studies of Efe Pygmies and Lese horticulturalists in the Ituri forest, Zaire. *American Journal of Physical Anthropology* 78:459-471.
- BAILEY, R.C., G. HEAD, M. JENIKE, B. OWEN, R. RECHTMAN, AND E. ZECHENTER.
1989 Hunting and gathering in tropical rain forest: Is it possible? *American Anthropologist* 91:59-82.
- BAILEY, R.C., AND T.N. HEADLAND.
1991 The tropical rain forest: Is it a productive environment for human foragers? *Human Ecology* 19:261-285.
- BECKERMAN, S.
1983 Does the swidden ape the jungle? *Human Ecology* 11(1):1-12.
- BECKERMAN, S.
1983b Bari swidden gardens: Crop segregation patterns. *Human Ecology* 11(1):85-101.
- BERGMAN, R.
1980 *Amazon Economics: The simplicity of Shipibo Indian wealth*. Ann Arbor, MI: University of Microfilms Int.
- BIRD-DAVID, N.H.
1982 "Inside" and "outside" in kinship usage: The hunter-gatherer Naikan of South India. *Cambridge Anthropology* 7:47-57.
- BIRD-DAVID, N.H.
1988 "Hunter-gatherers and other people: A re-examination", in *Hunters and Gatherers 1: History, evolution and social change*. Edited by T. Ingold, D. Riches, and J. Woodburn, pp. 17-30. Oxford: Berg Publishers.
- BIRD-DAVID, N.H.
1990 The giving environment: Another perspective on the economic system of the gatherer-hunters. *Current Anthropology* 31:189-196.
- BIRD-DAVID, N.H.
1992 Beyond "The hunting and gathering mode of subsistence": Culture sensitive observations on the Nayaka and other modern hunter-gatherers. *Man* (n.s.) 27:19-44.

- BOSE, N.K.
1956 Some observations of nomadic castes of India. *Man in India* 36:1-6.
- BROSIUS, J.P.
1991 Foraging in tropical rain forests: The case of the Penan of Sarawak, East Malaysia (Borneo). *Human Ecology* 19:123-150.
- BROWN, M.F.
1984 The role of words in Aguaruna hunting magic. *American Ethnologist* 11(3):545-558.
- BROWN, M.F., AND M.L. VAN BOLT.
1980 Aguaruna Jivaro gardening magic in the Alto Rio Mayo, Peru. *Ethnology* 19(2):169-190.
- BUTT, A.J.
1977 "Land use and social organization of tropical forest peoples of the Guianas," in *Human Ecology in the Tropics*. Edited by J.P. Garli and R.W.J. Keays, pp. 33-49. New York: Pergamon.
- CARNEIRO, R.L.
1970 Hunting and hunting magic among the Amahuaca of the Peruvian Montaña. *Ethnology* 9(4):331-341.
- CASHDAN, E.
1985 Coping with risk: Reciprocity among the Basarwa of northern Botswana. *Man* 20:454-475.
- COLINVAUX, P.A., AND M.B. BUSH.
1991 The rain-forest eco-system as a resource for hunting and gathering. *American Anthropologist* 93:153-160.
- CONKLIN, H.C.
1954 An ethnoecological approach to shifting agriculture. *Transactions of the New York Academy of sciences* (Series 2) 17:133-142.
- DEETZ, J.
1968 "Hunters in archaeological perspective", in *Man the hunter*. Edited by R.B. Lee and I. De Vore, pp. 281-285. Chicago: Aldine
- DENBOW, J.
1984 "Prehistoric herders and foragers of the Kalahari," in *Past and present in hunter gatherer studies*. Edited by C. Schrire, pp. 253-276. New York: Academics.
- DWYER, P.D., AND M. MINNEGAL.
1991 Hunting in lowland, tropical rainforest: towards a model of non-agricultural subsistence. *Human Ecology* 19:187-212.
- EISENBERG, J.F.
1984 "Behavioural adaptations of higher vertebrates to tropical forests," in *Tropical Rain forest eco-systems: Structure and function*. Edited by F.B. Golley, pp. 267-278. New York: Elsevier.
- ENDICOTT, K., AND P. BELLWOOD.
1991 The possibility of independent foraging in the rain forest of Peninsular Malaysia. *Human Ecology* 19:151-185.
- FLOWERS, N.M., D.R. GROSS, M.I. RIFFER, AND D.W. WENER.
1982 Variations in swidden practices in four central Brazilian Indian societies. *Human Ecology* 10:203-217.
- FOX, R.G.
1969 "Professional primitives": Hunters and gatherers of nuclear South Asia. *Man in India* 49:139-160.
- GARDNER, P.M.
1966 Symmetric respect and memorate knowledge: The structure and ecology of individualistic culture. *Southwestern Journal of Anthropology* 22:389-415.
- GARDNER, P.M.
1985 Bicultural oscillation as a long-term adaptation to cultural frontiers: Cases and questions. *Human Ecology* 13:411-432.
- GARDNER, P.M.
1991 Foragers' pursuit of individual autonomy. *Current Anthropology* 86:367-384.
- GARDNER, P.M.
1993 Dimensions of subsistence foraging in South India. *Ethnology* 32:109-144.

- GEERTZ, C.
1969 "Two types of ecosystems," in *Environment and cultural behaviour: Ecological studies in cultural anthropology*. Edited by A.P. Vayda, pp. 3-28. Berkeley: The Natural History Press.
- GRIFFIN, P.B.
1984 "Forager resource and land use in the humid tropics: the Agta of Northeast Luzon," in *Past and present in hunter gatherer studies*. Edited by C. Schrire, pp. 95-121. New York: Academic.
- GUDDEMI, P.
1992 When horticulturalists are like hunter-gatherers: the Sawiyano of Papua New Guinea. *Ethnology* 31:303-314.
- HAMES, R.
1983 Monoculture, polyculture, and polyvariety in tropical forest swidden cultivation. *Human Ecology* 11(1):13-34.
- HART, T.B., AND J.A. HART.
1986 The ecological basis of hunter-gatherer subsistence in African rain forests. *Human Ecology* 14:29-55.
- HAWKER, K., K. HILL, AND J. O'CONNEL.
1982 Why hunters gather: Optimal foraging and the Ache of Eastern Paraguay. *American Ethnologist* 9:379-398.
- HEADLAND, T.N.
1987 The wild yam question: How well could independent hunter gatherers live in tropical rain forest ecosystem? *Human Ecology* 15:463-491.
- HEADLAND, T.N., AND L.A. REID.
1989 Hunter-gatherers and their neighbours from prehistory to the present. *Current Anthropology* 30(1): 43-66.
- HEADLAND, T.N., AND R.C. BAILEY.
1991 Introduction: Have hunter-gatherers ever lived in tropical rain forest independently of agriculture? *Human Ecology* 19:115-122.
- HENRY, J.
1951 The economics of Pilaga food distribution. *American Anthropologist* 53:187-219.
- HLADIK, A., S. BAHUCHET, C. DUCATILLION, AND C. HLADIK.
1984 Les plantes a tubercules de la forest dense d' Afrique centrale. *La Terre et La Vie* 39:249-290.
- HOFFMAN, C.
1986 *The Punam hunter-gatherers of Borneo*. Ann Arbor, MI: University of Michigan Research Press.
- HUTTERER, K.L.
1983 The natural and cultural history of Southeast Asian agriculture. *Anthropos* 78:169-212.
- IGBOZURIKE, M.U.
1971 Ecological balance in tropical agriculture. *The Geographical Review* 61:510-529.
- INGOLD, T.
1987 *The appropriation of nature*. Iowa City: University of Iowa Press.
- JANZEN, D.H.
1975 *Ecology of plants in the Tropics*. London: Arnold.
- JOHNSON, A.W.
1978 In search of the affluent society. *Human Nature* 1(9):50-60.
- KAMEN-KAYE, D.
1977 Ichtyotoxic plants and the term "barbasco." *Bot. Mus. Leaflets* 25(2):71-90.
- KAPP, D.B., AND P. HOCKINGS.
1989 "The Kurumba tribes," in *The blue mountains: The ethnography and biogeography of a South Indian region*. Edited by Paul Hockings, pp. 232-248. Oxford: Oxford University Press.
- KASS, D.
1978 Polyculture cropping systems: Review and analysis. *Cornell International Agriculture Bulletin* No.32.

- KEMPF MERCADO, N.
1980 *Flora Apicola Subtropical de Bolivia*. Universidad Mayor Gabriel Rene Moreno, Santa Cruz, Bolivia.
- KENT, S.
1989 *Farmers as hunters: The implications of sedentism*. Cambridge: Cambridge University Press.
- LEACOCK, E.B., AND R.B. LEE.
1982 *Politics and history in band societies*. Cambridge: Cambridge University Press.
- LEE, R.B.
1979 The !Kung San: Men, women and work in a foraging society. Cambridge: Cambridge University Press.
- LEE, R.B.
1992 Art, science, or politics? The crisis in hunter-gatherer studies. *American Anthropologist* 94:31-54.
- LEE, R.B. AND I. DEVORE.
1968. *Man the hunter*. Chicago: Aldine.
- LIZOT, J.
1972 Poisons Yanomami dechase, de guerre et de peche. *Anthropologica* 31:3-20.
- LONGMAN, K. A., AND J. JENIK.
1974 *Tropical forest and its environments*. London: Longman.
- LOUCKS, O.L.
1977 Emergence of research on agro-ecosystems. *Annual Review of Ecological Systems* 8:173-92.
- MARX, K.
1970 (1867) *Capital: A critique of political economy*. London: Lawrence and Wishart.
- MABBERELY, D.J.
1983 *Tropical rain forest ecology*. New York: Chapman and Hall.
- MEGGERS, B.J.
1971 *Amazonia: Man and culture in a counterfeited paradise*. Chicago: Aldine.
- MEGGERS, B.J.
1973 "Some problems of cultural adaptation in Amazonia, with emphasis on the pre-European period," in *Tropical forest ecosystem in Africa and South America: A comparative review*. Edited by B.J. Meggers, E.S. Ayensu, and D. Duckworth, pp. 311-320. Washington: Smithsonian.
- MEILLASSAUX, C.
1972 From reproduction to production: A Marxist approach to economic anthropology. *Economy and Society* 1:93-105.
- MEILLASSAUX, C.
1973 "On the mode of production of the hunting band," in *French perspectives in African studies*. Edited by P. Alexandre, pp. 187-203. London: Oxford University Press.
- MILTON, K.
1984 Protein and carbohydrate resources of the Maku Indians of Northwestern Amazonia. *American Anthropologist* 86:7-27.
- MORSKO, M.
1987 The symbols of "forest": A structural analysis of Mbuti culture and social organization. *American Anthropologist* 89:896-913.
- MORRIS, B.
1977 Tappers, trappers and the Hill Pandaram (South India). *Anthropos* 72:225-241.
- MORRIS, B.
1982a *Forest traders: A socio-economic study of the Hill Pandaram*. London: Athlone Press.
- MORRIS, B.
1982b Economy, affinity and inter-cultural pressure: Notes around Hill Pandaram group structure. *Man* 17:452-461.
- MORRIS, B.
1982c "The family, group structuring and trade among South Indian hunter-gatherers," in *Politics and history in band societies*. Edited by E. Leacock and R. Lee, pp. 189-211. Cambridge: Cambridge University Press.

- MYRES, F. R.
1988 Critical trends in the study of hunter-gatherers. *Annual Review of Anthropology* 17:261-282.
- PETERSON, J. T.
1978 Hunter-gatherer/farmer exchange. *American Anthropologist* 80: 335-351.
- POIRIER, F. E.
1989 "The non-human primates of the Nilgiris," in *The blue mountains: The ethnography and bio-geography of a South Indian region*. Edited by Paul Hockings, pp. 79-101. Oxford: Oxford University Press.
- POSEY, D. A.
1981 Wasps, warriors and fearless men: Ethnoentomology of the Kayapo Indians of Central Brazil. *Journal of Ethnobiology* 1(1):165-174.
- POSEY, D. A.
1982 Keepers of the forest. *Garden* 6:18-24.
- RICHARDS, P. W.
1973 The tropical rain forest. *Scientific American* 229(6):58-67.
- RUDDLE, K.
1973. The human use of insects: Examples from Yukpa. *Biotropica* 5(2):94-101.
- RUTHENBERG, H.
1971 *Farming systems in the tropics*. London: Clarendon Press.
- SCHRIRE, C.
1984 *Past and present in hunter-gatherer studies*. Orlando: Academic Press.
- SISKIND, J.
1978 Kinship and mode of production. *American Anthropologist* 80:860-872.
- SMOLE, W. J.
1976 *The Yanamamo Indians: A cultural geography*. Austin: University of Texas Press.
- SPONSEL, L. E.
1986 Amazon ecology and adaptation. *Annual Review of Anthropology* 15:67-97.
- SPONSEL, L. E.
1989 "Farming and foraging: A necessary complementarity in Amazonia?" in *Farmers as hunters: The implications of sedentism*. Edited by S. Kent, pp. 37-45. Cambridge: Cambridge University Press.
- STEARMAN, A. M.
1991 Making a living in the tropical forest: Yuqui foragers in the Bolivian Amazon. *Human Ecology* 19:245-260.
- THARAKAN C., GEORGE.
2003 The mixed economy of the South Indian Kurumbas. *Ethnology* 42(4):323-334.
- URBINA, L., AND H. D. HEINEN.
1982 Ecología, organización social y distribución espacial: Estudio de caso de dos poblaciones indígenas: Pemón y Warao. *Antropológica* 57: 25-54.
- VON LINGERKE, H. J., AND F. BLASCO.
1989 "The Nilgiri environment," in *Blue Mountains*. Edited by Paul Hockings, pp. 20-78. Oxford: Oxford University Press.