Human Health and Forests
A Global Overview of Issues, Practice and Policy

Edited by Carol J. Pierce Colfer

Earthscan People Plants International Conservation Series

Hundreds of millions of people live and work in forests across the world. A vital, yet largely unexamined, aspect of their lives are the issues and challenges of protecting and enhancing human health in forested areas and the unique relationship between the health of forests and the health of people.

This book, written for a broad audience, is the first comprehensive introduction to the issues surrounding the health of people living in and around forests, particularly in Asia, South America and Africa. Part I is a set of synthesis chapters, addressing policy, public health, environmental conservation, and ecological perspectives on health and forests including women and child health, medicinal plants and viral diseases such as Ebola, SARS and Nipah Encephalitis. Part II takes a multi-lens approach to lead the reader to a more concrete and holistic understanding using case studies from around the world that cover issues as important as the links between HIV/AIDS and the forest sector and diet and health. Part III looks at the specific challenges to health care delivery in forested areas including remoteness and the integration of traditional medicine with modern health care. Generous use of boxes with specific examples add layers of depth to the analyses and the book concludes with a synthesis designed for use by practitioners and policymakers to work with forest dwellers to improve their health and their ecosystems.

This book is a vital addition to the knowledge base of all professionals, academics and students working on forests, natural resources management, health and development world-wide.

Published with People and Plants International

Carol J. Pierce Colfer is Principal Scientist in the Governance Division of CIFOR, in Bogor, Indonesia, where her work aims to improve the lives of people living in and near forests.

Contents


352 pp., 6 3/4" x 9 1/2", Figures, boxes, tables, March 2008

Published by Earthscan Publications Ltd.
Human beings are primates, endowed with symbolic thought and culture. They not only try to satisfy biological needs but are also driven by cultural wants in both the material and non-material worlds. These wants generate behaviours that are not meant to contribute to human biological adaptation but rather are aimed at providing psychocultural rewards in the symbolic field, which may in turn have some influence on material wellbeing.

In this chapter we highlight some of the cultural aspects of human diet and health (see Chapter 4, this volume). In trying to convey the significance of cultural difference, we have struggled with a problem that is common for anthropologists and ethno-biologists wanting to share their analyses: we tend to see things in a very holistic manner, and pulling the health-related aspects of human behaviour out of their cultural context is somehow alien. To avoid misrepresentation, we must explain some points in detail to show how local people’s symbolic understandings affect their understanding of health and their practices that lead to (or diminish) health.

Rather than covering the whole spectrum of cultural factors that influence the diet and health of human beings, we have selected a short list of diverse topics – cultural adaptation, food choices, biological optimization, cultural forms of hunger, treatment of high-risk groups, traditional medicines, and social change – that clearly highlight health-related aspects of culture. We illustrate these topics with experiences in central Africa, Indonesia and Amazonia among forest groups whose cultures are intimately connected with forests (Figure 13.1). By briefly exploring these topics, we hope to bring out the tremendous complexity of the cultural dimension of human-forest interactions. Box 13.1 highlights the methods and approaches we implemented during our research. Box 13.2 provides a sense of the holistic nature of culture’s health-related aspects through the particular case of the Fang of southern Cameroon by detailing some crucial elements of their health-related belief and symbolic system.

**FOOD, HEALTH AND CULTURAL ADAPTATIONS**

Since the concept of adaptation – defined as a continuing process of all organisms to achieve a better environment-organism fit in responding to changes in their environment (Appell, 1986, p44) – was first introduced, it has been used in many ways. Of these
In southern and coastal Cameroon (Koppert et al., 1993; Froment et al., 1996) as well as in East Kalimantan (CIFOR, 2006), we have been carrying out studies among rural ethnic groups that are no longer in a situation of pristine isolation and have become involved in a broader cash and market economy during the past half-century. The analytic framework adopted to undertake the anthropology of food among these groups consists of a blending of three complementary grids of comparison (Figure 13.2).

- Inter-ethnic. We synchronically studied distinct ethnic groups sharing the same ecosystem. This ‘synecological’ referential offers the opportunity to analyse the discrete cultural choices elaborated by societies confronted with the same ecological constraints. Cameroon: Mvae trappers, Yasa fishers, Kola Pygmies. Kalimantan: Tubu Punan, Belaka Punan.

- Ecosystemic. We synchronically studied the same ethnic group (the Mvae trappers and farmers) living in two contrasted forest ecosystems. This ‘auto-ecological’ referential provides a choice field to analyse how ecological constraints affect the strategies of distinct communities with the same origin. Cameroon: coastal Mvae trappers in the evergreen coastal forest, inland Mvae trappers in the semi-deciduous continental forest. Kalimantan: remote Tubu Punan, peri-urban Tubu Punan.
Diachronic. It is practically a truism to say that culture is mutable, and that people change. Nevertheless, studies that have explored the dynamics of traditional societies over a fairly long time are few and far between. We also studied the same population living in the same ecosystem but at two distinct periods. Cameroon: coastal Mvae trappers studied by Günter Tessmann in the 1890s, coastal Mvae trappers studied by Edmond Dounias in the 1990s. Kalimantan: medical archives on nomadic Punan in the early 20th century, Tubu Punan studied by CIFOR in the 2000s.

The main results described here concern the Kalimantan case. The inter-ethnic referential clearly reveals, among other things, the diverging diet strategies, the distinct traditional healing practices, and the contrasted economic choices between the Belaka and the Tubu (two groups of Punan who know each other, both having lived in the same forest environments and both formerly nomadic hunter-gatherers). Use (or abuse) of the generic term ‘Punan’ is dangerous, because it overshadows fundamental differences between communities whose cultures do not respond in the same ways to the similar environmental constraints conditioning their diets and health status.

The ecosystemic referential offered the opportunity to compare the needs and wants of two Tubu Punan communities that constantly interact and share the same culture, language and origins, but confront totally different environments. Results reveal interesting trade-offs between the two communities. The peri-urban Punan, who agreed to leave the Tubu watershed 30 years ago to settle near the city of Malinau, enjoy easy access to small-town facilities (schools, dispensaries, markets, job opportunities) and appear economically richer than their parents who chose to stay in the forest. But the former suffer from many social ailments (insecurity, depression, stress, drug addiction, violence) caused by marginalization, social injustice and individualistic attitudes (see Box 10.2 and Chapter 15, this volume). Those who

Figure 13.2 The three complementary 'referentials' used for the study of adaptive human ecology (adapted from Dounias, 1996)
live in the forest envy the material comfort of their peri-urban relatives, but the forest dwellers are much better off in terms of diet and physical fitness, and they profit from the absence of the land tenure conflicts that trouble the more urban Punan. The rural Punan appreciate free access to all kinds of forest resources but pay a heavy tribute in infant mortality because of epidemic outbreaks that erratically occur upstream.

The diachronic referential reveals clearly that the remote Tubu Punan, who renounced a nomadic lifestyle and now live in permanent villages, are much more exposed to transmissible and contagious diseases than their grandparents. Their pharmacopoeia is insufficient to treat diseases like malaria, measles and smallpox, which rarely afflicted their ancestors while they were still forest nomads. A sedentary lifestyle in a pacified environment has reduced warfare and head hunting, but life in permanent villages has considerably increased the risk of contracting vector-borne, zoonotic and crowding diseases (see Chapter 12, this volume), and the remoteness of the settlements along a poorly navigable watershed excludes these communities from access to dispensaries (see Chapter 15, this volume).

multiple possibilities, it is necessary to make a fundamental distinction between biological and psycho-cultural adaptation. Adaptation always involves the sociocultural world of which the individual is a member, and therefore it is necessary to view the psychocultural dimension of adaptation as a fundamental characteristic of any human society. Nevertheless, until recently the dominant tendency among biological anthropologists has been to look upon people’s feeding behaviour and health status through the lens of biological adaptation alone. Interest in the cultural dimension of adaptive responses was strictly limited to practical and material matters, and culture was narrowly reduced to food habits, preferences, choices and overall dietary strategies that contributed to academic discussion about ecology, nutrition and overall subsistence within an evolutionary perspective.

Food is certainly the most appropriate and integrative topic within which to investigate the contributions of culture to biological adaptation and nutritional success (Garine, 1972). However, many cultural behaviours that come into play in the field of food choices incorporate traits – like hedonism – that can hardly be seen just as adaptive responses (Durham, 1976).

Wild yam gathering by the Baka hunter-gatherers of eastern Cameroon is an example that highlights the need to investigate jointly the ecological and psycho-cultural dimension of food. Dounias (2001) has demonstrated that the Baka have a detailed knowledge of the ecology and biology of yam vines, which are extremely difficult to observe in the forest undergrowth. The Baka also have a dynamic understanding of the plant’s growth cycle, and they know how to take advantage of the yam’s double capacity to reproduce both sexually and vegetatively. Ethno-linguistic data have revealed the unique status of yams in Baka plant nomenclature. Baka terms applied to yam morphology are specifically drawn from terms referring to human anatomy, and the Baka also have a wide range of names for the kinds and parts of tubers as well as their consistency and taste. But the harvesting procedures are certainly the key aspect of yam expertise. Dounias uses the term ‘paracultivation’ to define perennial harvesting practices
aimed at managing yam production while keeping the tuber plants in their original forest environment; these procedures are accompanied by social rules protecting the rights of ownership over a supposedly ‘wild’ resource (the plant is cared for, protected, owned, managed and eventually inherited as a private possession); it has even determined the technical design of a digging tool – an auger – that is perfectly adapted to the constraints of a nomadic lifestyle: it is efficient, easy to make and, most important, ephemeral. But beyond their primary function as food, wild yams occupy the full status of a cultural good. They appear in matrimonial payments, prestige dishes and the pharmacopoeia, and they play a central role as a ritual object in the complex interactions among the Baka, the elephant and the mighty spirit of the forest. Yams provide edible tubers that are rich in carbohydrates and proteins. But yams are not only good to eat, they are also good to think about. They not only contribute to the nutritional integrity of the Baka, they also mediate their necessary relationships with the invisible world and the spirits who are seen to exert control over forest resources. This not-atypical example clearly illustrates how ecological perspectives should not be separated from cultural aspects, or people’s perceptions of their resources.

**FOOD CHOICES AND WELLBEING**

The multiplicity of cultural factors influencing food choices and inducing what Igor de Garine describes as the ‘biological arbitrariness of food habits’ (Garine, 1993) are specific to humankind and have contributed to its originality. To understand the dynamics of maintaining a food system and the rationality that is built on forest resources, it is essential to explore the ‘emic’ dimension of food. ‘Emic’, a linguistic and cultural anthropological term, ‘distinguishes the understanding of cultural representations from the point of view of a native of the culture’ from the opposing term, ‘etic’, meaning ‘from the point of view of an outside observer of the culture’ (Barfield, 1997, p148).
Among the Aka Pygmies of the Central African Republic, for instance, the feeling of being replete – required for wellbeing – can be obtained only from an essentially meat-and-honey diet eaten to satiety (Bahuchet, 1985; Thomas, 1987). The high value attributed to both these foodstuffs is also noticeable in their pre-eminence in the prominent rituals of life. For the Aka, ‘health’ is inseparable from ‘life’: the same word is used for both concepts, and both can find full expression only in conditions of equilibrium and harmony.

What is bad for a particular cultural community is not necessarily bad for others. The perceived quality of food is obviously related to the gustatory preferences of the consumer. However, the cultural dimension has such a large impact on food choice that separating the psychological from the physiological aspects of food perception (or taste) has become a challenging task. From an adaptive, biological perspective, the unpleasant bitter taste of many plants, due to substances like alkaloids, expresses the fact that the plant is poisonous – a result of its adaptation to potential plant eaters – and our adaptation to the potential danger. In that respect, bitter cassava cultivars are potentially more toxic because of their cyanide and cyanogenic glucosides content. Nevertheless, many farming societies throughout the world express a clear preference for bitter cassava cultivars.

This preference for bitter over sweet tastes may appear to contradict the general trend that humans select the less toxic cultivars of a given food plant (Johns, 1990). Westerners typically consider human exposure to naturally-occurring cyanides to be wholly undesirable and detrimental to health. But studies have shown that sub-acute exposure may sometimes provide a range of metabolically positive effects for certain consumers. Dietary cyanogenic glycosides may subtly modify the oral biology, for instance by enhancing salivary thiocyanate concentrations that are known to kill oral bacteria and reduce caries and tissue ulceration rates (Jackson, 1994). Among several arguments advanced to justify cultural preferences for bitter cassava (Dufour, 1993), a culinary explanation is that the quality of starch in most bitter cultivars is more suitable for certain foods, responding to locally desired sensory properties, such as touch, smell and taste (Lathrap, 1973). A similar argument was given by the Kubu hunter-gatherers of Sumatra, who used to maintain groves of wild yams, hidden in the undergrowth of natural forest, consistently choosing toxic species for these groves (Doutias, 2005).

**BIOLOGICALLY SUB-OPTIMAL NUTRITION**

By trying to avoid psychological unrest through satisfying symbolic demands, sometimes at the expense of optimal nutritional options, traditional societies are inclined to adopt what could be interpreted as a ‘philosophical approach’ to biological fitness: they make cultural choices that are not necessarily meant to respond to the principle of optimality (Foley, 1985). The particularity of human society may even lie in a recurrent inability to systematically achieve ideal biological fitness (Garine, 1991). A good illustration is the consumption of a particular type of ‘food’ that can sometimes be considered medicine and that may be classed as a drug in the West. Substances like qat, coca, tobacco and alcohol have been vehicles for different forms of social interactions. Their use has played a role in the expression and maintenance of a
particular social order, and their exchange was used to draw attention to related verbal exchanges. Among the Tukanoan- and Witotoan-speaking groups of northern Amazonia, the exchange of such products was used as a frame and pretext for heightened social interactions (Hugh-Jones, 1999). When the social frame is altered by trends – like commoditization – that encourage increasingly individualistic behaviours, the consumption of these substances turns into real drug addiction, with all its deleterious effects and social ailments.

**CULTURAL FORMS OF HUNGER**

Even though forests in equatorial latitudes provide a constant supply of various potential foods that reduce the risk of food shortage (Garine and Harrison, 1988), forest-dwellers are known to undergo what they perceive as ‘lean periods’ in food supply. One may refer here to psychological stress (Harrison, 1982), which has a cultural component exhibiting tangible effects and possibly negative health consequences.

Some authors have attempted to demonstrate how the lack of culturally-valued foods, such as meat, sometimes causes psychological unrest that in turn have negative biological consequences, such as cardiovascular ailments, vulnerability to infection or low growth rates among children (Bahuchet, 1985; Pagezy, 1988). Among the Aka Pygmies of Central Africa, for instance, meat hunger – even in the absence of measured dietary deficiencies – is said to bring about tiredness, loss of vital strength and, in turn, illness resulting from effects expressed at very diverse levels with a blending of material and symbolic aspects (Thomas, 1987). Meat is perceived as essential for health because it is a sign of the hunter’s condition as well. Hunting requires all one’s mental and physical abilities, and thus abundance of meat reflects a healthy hunter (and through him, the vitality of the whole community), with which meat is unconsciously and symbolically associated (Motte-Florac et al, 1993). Similar cravings also exist for fish and other seasonal water-related resources. They are likewise expressed among farming societies, especially when cultural ‘superfoods’ (Jelliffe, 1967) are dwindling; these are carbohydrate staples like rice and sago throughout Southeast Asia (Ellen, 1979; Conklin, 1980) and cassava among Amerindians (Lancaster et al, 1982).

**FOOD AND NUTRITION AMONG ‘HIGH-RISK’ GROUPS**

High-risk groups, as commonly defined by epidemiologists, are members of the community who are more likely than others to face health problems because of environmental constraints. These groups include pregnant and lactating women, infants with increased nutritional requirements and elderly people facing other types of nutritional risks (Pagezy and Garine, 1990). A luminous example of the social management of the diet and health of high-risk individuals is the case of the primiparous mother among the Ntomba of the Democratic Republic of the Congo (Pagezy, 1983; see Chapter 7, this volume, for more gender-related health care implications).
after childbirth, the first-time mother and her newborn are escorted by relatives back to her mother’s house, usually in another village. The young mother and child stay there for two to four years and benefit from very special care. She stays in a seclusion hut, respects numerous food and sexual taboos, uses tools that no one else is authorized to touch, and avoids any physical activity related to food production and preparation. She receives abundant food and daily exposes her fat body (considered healthy by the Ntomba), elaborately attired and made up to focus everyone’s attention on her (Figure 13.4). During this long period of seclusion, over-feeding and intensive care have beneficial consequences for the health status of both the mother and her firstborn, who in other contexts would suffer from low birth weight and weakness. Beyond the obvious adaptive implications of such carefully and benignly-scripted primiparity, the primiparous mother incarnates the ‘true mother’ and radiates a symbolic image of purity and good health that is a source of pride and psycho-cultural wellbeing for the whole community.

Figure 13.4  Chantal Wale, an Ekonda primiparous mother, poses with her daughter at the end of several years of seclusion, in front of a local painting glorifying primiparity

FOOD AND TRADITIONAL MEDICINE

The interactions between medical and nutritional systems have gained a broader audience because of the works of Nina Etkin and collaborators (see Etkin, 2001). In the forest regions of Africa, food and medicine are areas in which people have knowledge – as these pertain to themselves and to their environment. Fieldwork carried out in southern coastal Cameroon shows how beliefs and practices regarding food and health must be approached as a whole (Hladik et al, 1990; 1993). Such interactions can be assessed through local representations of body and health in relation to nutrition but also through medical practices where food is used in the treatment of illness. Some practices of traditional medicine use nourishment as an integral part of the treatment. The therapeutic dish (like chicken soup among US Jews) is a special kind of culinary preparation that in parts of Africa is used to cure victims of witchcraft, food taboo transgressors, and the possessed. The medicinal plants added to the dish constitute a magical protection for patients and help them recover. In the representations of the etiology of diseases caused by sorcery, food is used metaphorically – as in the case of èvú, in which the sorcerer symbolically devours his victim (Box 13.2). Among the Yasa fishers in southern coastal Cameroon, where both the biological reality and the symbolic aspects of health are simultaneously considered, food is used in various ways during rituals dedicated to the treatment of possession. During exorcism rites, for instance, a special preparation is distributed to all the participants in the ritual: patients, drummers and the public (Figure 13.5). It is this protection that makes the consumers invisible to their

Figure 13.5  Exorcism performance by Anasthasie Njuche, a Yasa renowned healer in southern Cameroon

enemies. Medical treatments in this area concern not only the sick individual but the entire community (Garine, 1988; 1990).

Most of the traditional medicines shared as food during these public rituals are forest products, and many are lost with the degradation or change of forest environments (Shanley and Luz, 2003; see also Chapter 3, this volume). Often the environment in which these plants grow is considered essential for the plants to elaborate medicinal powers (Falconer, 1990). In a context of drastic social change, traditional healing may seem inefficient in dealing with dangerous new emerging diseases (see Chapters 12 and 16, this volume). This is, for instance, the case for the Punan, former hunter-gatherers of East Kalimantan, who are confronted today with diseases that they did not meet when they were nomadic (Voeks and Sercombe, 2000). Traditional healers and wise elders are consequently losing their political influence, and social conflict has become recurrent between generations. A lack of social controls results in dramatic misuse of manufactured pills. Self-medication and related addictions degrade immunity and have become a major health problem for the Punan (Dounias and Froment, 2006).

**Box 13.2 Courtyard and Backyard: Managing Exposure to Disease**

The ‘Fang’ of Central Africa comprise diverse ethnic groups – Fang, Mvae, Ntumu, Nzaman, Okak – who speak different dialects of the Fang language sub-group. They understand each other’s languages and share common cultural traits. Courtyard and backyard are fundamental features of the habitat of the Fang in southern Cameroon. These landuses represent physical as well as cultural poles and serve opposed functions that mark out the life history of the Fang, social relationships and symbolically rich settings for everyday life and rituals.

A village has a common courtyard, which is indisputably a public space. It is expected to be a pleasing place that must appear friendly and warm to visitors. People commonly speak loudly in the courtyard, and communication tends to be effusive. Festive events and related dance, music, food and recreational performances always take place in the courtyard. The courtyard is also a privileged floor for communication. This is where the Fang organize the tribunal forum (an integral part of their indigenous legal system). The calling drum sits enthroned there on a special tripod on a platform, or it is sometimes hung in a tree so that its sound is amplified and its message is carried farther. The courtyard is the floor dedicated to leisure and resting. It is also characterized by bare soil and little vegetation, and thus it prevents the proliferation of undesirable animals (parasites, ticks, sand flies, tabanid flies, herbivores, snakes, weaver birds). Having a wide deforested area also regulates the resprouting of spontaneous seedlings, since the many birds living in the forest undergrowth and other seed dispersers are discouraged from flying over or running through such large open spaces. (Colfer noted a similar pattern among her Javanese transmigrant neighbours in Sumatra, who rather compulsively cleaned their houseyards, to keep snakes and other vermin away and to demonstrate to neighbours their industry and tidiness.) Maintaining the soil surface flat and free of vegetation and other debris also prevents puddles and thus limits the proliferation of mosquitoes. The Fang devote a significant amount of time to cleaning, weeding...
and removing useless roots and stumps from their courtyard. Sweeping the courtyard not only removes garbage and animal leavings and prevents vermin, but also symbolically removes importunate spirits. In front of houses – directly under the roof or in shade trees planted there – the Fang also hang containers to gather clean rainwater. Some courtyard trees with an appropriate architecture are even specifically planted to serve as receptacles for rainwater containers. These trees are also used for hanging washed clothes out to dry.

Within the village, each main compound has its own backyard – a private and even, to some extent, unfriendly space. Access to backyards is not really forbidden but it is implicitly restricted or, better said, discouraged. The backyard is known to be full of magical components from vegetal, animal and mineral sources that are hidden in dense undergrowth mimicking the natural forest. By contrast to the care provided to each of the plants growing in the courtyard, the backyard agroforest looks more like a vegetative mess. This space receives the cooking garbage and all the detritus that is carefully swept away from the courtyard. Backyards also benefit from natural fertilization by fallen leaves and the leavings of wildlife, livestock and humans.

The backyard is a woman’s domain. Major access to the backyard is through the backdoor of the kitchen, and the old role of the backyard as a rescue pathway to evade intruders in wartime gave priority to women and their children. Women are in charge of disposing of domestic detritus in the backyard and gathering firewood. They also take care of the crops in the kitchen garden and all non-timber forest products that grow in the undergrowth of the backyard. More importantly, the women take care of countless medicinal plants that are hidden in the backyard and frequently used to treat children’s diseases and fecundity-related disorders.

Until recent times, Fang women used to give birth in the backyard, under the protection of magic that discouraged aggressive sorcery. After delivery, the mother buried the placenta in a secret location in the backyard, beyond the reach of witches. Labour and childbirth were carried out in a crouching position. This position has meaning among the Fang, who recurrently use the vagina to symbolize the foundation, the roots and thus the irremovable source of things, as opposed to the head, which symbolizes the growing or extendable extremity sometimes guiding people far from their origins. This symbolic value given to the vagina and the related crouching position that is adopted during delivery magnify an opposition force that is attributed to women in these fundamentally patrilineal, virilocial and usually patrilocal societies. Today, even if Fang women no longer give birth in the backyard, they still respect a period of seclusion after delivery, when the mother and her child are weak and thus particularly susceptible to witchcraft aggression. The seclusion area is always set up along the back wall of the kitchen, which is considered the most secure place within the house.

The ritual life of the Fang is extremely rich and marked by several initiation procedures that are a prerequisite to entering various secret societies. Fang pagan cults still endure even though they have been weakened today by mission activity and government prohibition and are now confined to the discreet environment of the backyard.

Witchcraft and sorcery are condemned by the church and denounced during the public judgment of persons who are suspected of devoting themselves to such forbidden practices. The tribunal always officiates in the courtyard. Despite the highly visible sentencing, witchcraft dictates the daily life of the Fang and profoundly conditions their social relations. The origin of Fang witchcraft beliefs lies in the obvious difference in the destinies of individuals. The Fang have concluded that there are several sorts of people according to whether they do or do not possess the witchcraft being, èvù, that predestines one’s fortune in life. The Fang then couch their discussion of witchcraft in terms of personal ambition and the search for wealth and glory. Those who have a strong èvù are true witches. The èvù, for the selfish purposes of its
Today, it is widely recognized that transmissible diseases have distinct expressions according to both their ecological context and the human societies affected. Grmek (1969) introduced the concept of pathocoenosis, which suggests that diseases should not be considered isolated problems but instead need to be analysed as a set of diseases in interaction with a given human society and its environment. 'Human ecology' posits the same idea: that the response of an isolated individual to a single disease is no longer the central issue. Instead, one needs to address all the biological constraints that affect a group of humans who are marked by their own historical, religious, ideological and socioeconomic backgrounds.

The situations of social change that are occurring today among forest-dwellers are particularly revealing of the complexity of the interactions in play. Speedy, uncontrolled and forced social change can be harmful to people's health and may in turn be detrimental to their environments. Accordingly, such change puts added demands on the community, especially if it is neither desired nor anticipated. It may result in psychological loss, which if not managed properly may cause dysfunctional reactions.

Throughout their history, forest dwellers have had to adapt to perennial change in forest ecosystems. However, the changes that they face today are much more brutal and radical than those experienced in the past. As deforestation, drastic modification of
resource availability and the invasive influence of the cash economy occur more rapidly, local social, cultural, economic and political systems become increasingly difficult to accommodate (see Chapter 11, this volume). Past forager societies provide dramatic examples of populations that have been forced to make choices that are no longer validated by experience and have been revealed as costly in terms of ecological success (Dounias and Froment, 2006):

- Abandoning camp after a death to protect the living relatives from the wandering and harassing spirit of the dead was a common cultural practice among many foraging societies that efficiently reduced the community’s exposure to infectious disease.
- Limited use of food storage among forest foraging peoples reduced the likelihood of proliferation of potential vectors of rodent-borne diseases. Similarly, some swidden agriculturalists cultivated crops that were propagated clonally and thus naturally stored in the field, not in the home.
- The nomadic Punan had little trouble with smallpox – a serious problem for Kenyah farmers – because the Punan practised silent barter, which served as a social fence protecting them from the epidemics that plagued their sedentary Kenyah neighbours (Knapen, 1998).
- In conditions of low pollution and high recycling by aquatic fauna, the Punan are less exposed to faecal pollution than some other forest-dwellers because of their use of the river for sanitary purposes. Wanting healthy rivers in which to collect clean water for domestic purposes explains why the Tubu Punan have refused to resettle downstream, closer to town (Levang et al, 2006).
- The native garb of the Punan was minimal. Today most Punan wear European clothes, urged on them by missionaries and local authorities, even though such clothes are not well suited for use in the forest. In the absence of soap, the same clothes are worn dirty until they wear out, creating a propitious ground for infectious skin diseases.
- Social regulations like mutual aid, collective activities and food sharing are still common among the Punan who live in the forest, but these customs are in constant decline among their suburban relatives. The increasingly individualistic behaviour jeopardizes high-risk persons like elderly widows who depend on the generosity of other members of the community for nutrition and health (Figure 13.6).

These examples reveal how social change can sometimes invalidate defense mechanisms and nutritional status. Deteriorating physical health can in turn compromise the social and cultural integrity of the society.

An important change in the dietary habits of many traditional societies throughout the past century is the decrease in plant-ash salt production and consumption. Salt was obtained by burning large quantities of plants to ash, then filtering the diluted ash through porous pottery. The filtrates – naturally occurring inorganic substances, including iodine, among others – were traditionally incorporated in dishes as condiments (Portères, 1957). Plants from an aquatic environment, which facilitates ionic uptake, were preferred (Lemonnier, 1984; Dounias, 1988). The development of goitre is fairly recent in some
traditional societies – like the Azandé of the Democratic Republic of the Congo (Prinz, 1993) – and a few authors assume that this development may be the consequence of the decrease in ash salt consumption and its replacement by poorly iodized sodium chloride mineral salt. The situation in East Kalimantan differs markedly, however. Until quite recently, remote Bornean populations had very limited access to salt – indeed, it was highly prized, holding an important symbolic role among the Kenyah – whereas now people can usually buy inexpensive and iodized salt much more easily than in the past.

The Kenyah case reminds us that social change may not necessarily be accompanied by a less balanced biological optimum. There are also many examples revealing positive consequences of change, such as the neutralization of endemic warfare and related anthropophagous practices in Papua. Kuru disease, a progressive neurological disorder, used to be rampant among the Fore natives of the New Guinea highlands. The lethal

Figure 13.6  Meat sharing (here a barking deer) is still the rule among the remote Punan villagers (here in Long Pada, Tubu watershed, Eastern Kalimantan), but is no longer practised by their peri-urban and more individualistic relatives

degeneration was caused by a prion that was ingested during ritual acts of mortuary cannibalism. The disease declined with the progressive abandonment of the ritual cannibalistic practices (Gajdusek, 1996). Other examples include the renouncing of infanticide by Amerindian societies like the Yanomami of the Amazon (Early and Peters, 2000; see Chapter 11, this volume); the significant improvement in dental health from changes in food preparation, the abandonment of the use of teeth as tools, the renouncement of dental mutilation (pointed teeth, upper incisor pulling) for aesthetic purposes, and increased consumption of exotic foods that increase calcium in the diet (Walker et al, 1998); and the decrease in infant mortality among the Kenyah attributable to better nutrition and the presence of resident paramedics in the villages (Colfer, personal observation).

CONCLUSION

This chapter has provided case material primarily from long-term research conducted in Central Africa and Indonesia and also Amazonia about the kinds of ways that culture affects health. Although the particular examples we have provided are unique to these particular cultural contexts, important interactions between culture and forested environments are universal. One point we would like to emphasize is that each and every culture is unique, and thus it is impossible to develop standardized approaches to improving the health of people in forested areas: approaches that will work in all contexts are extremely rare. This also implies the necessity to study each group carefully or work closely with the people in each context to develop appropriate approaches.

Degrading diets and increasing illnesses are symptomatic warnings alerting us to ongoing ecological and sociocultural maladaptations. Yet few anthropologists have explored the cultural feeling of ‘ill-being’ expressed by forest peoples. There is a pressing need for further anthropological research, especially among the few remaining traditional societies subsisting in close interaction with their forest while confronted with drastic changes in their environment (Froment, 1997).

The complexity of the connections between the forest and human health is an increasing matter of debate on the international scene, but such debate remains rhetorical, for two reasons. First, the holistic approaches that would improve communication among conservationists and scientists in medicine, environmental health, ecology, anthropology and forestry – all dealing separately with similar issues – are rare, with a resulting failure to exchange views or share findings. The sociocultural factors that we have highlighted in this chapter, for instance, are generally neglected or, worse, considered anecdotal or retrograde expressions of folklore. Second, the systemic connections that everyone is debating remain poorly documented. In a recent review of roughly 650 documents exploring the state of knowledge concerning human health in forests, Colfer et al (2006) found few studies that looked at these issues in a systematic, comparative, interdisciplinary, longitudinal way. More long-term research studies devoted to these issues are in order, but time is short. Immediate action is required to protect the forest’s fast-changing environments and human populations.
REFERENCES

Falconer, J. (1990) *The Major Significance of Minor Forest Products. The Local Use and Value of Forests in the West African Humid Forest Zone*, Community Forestry Note 6, FAO, Rome, Italy


