COOKING THE WILD: THE ROLE OF THE LUNDAYEH OF THE ULU PADAS (SABAH, MALAYSIA) IN MANAGING FOREST FOODS AND SHAPING THE LANDSCAPE

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This thesis is in memory of George Baru Agong,

and is dedicated to his children.

Abstract

This thesis provides an account of the Lundayeh subsistence system as found in the villages of Long Pasia and Long Mio, situated in the Ulu Padas, Sabah. The research focuses on Lundayeh food and diet, describing the diversity of resources used and the importance of forest foods. Comparison with studies from elsewhere in Borneo suggests that there are many similarities between Lundayeh practices and those of other highland peoples.

These data are used to critically examine the concepts of 'wild' and 'wilderness', considering whether these concepts are meaningful, either analytically or for the Lundayeh. Investigation of the way in which the Lundayeh manipulate and manage their resources suggests that they have had a profound influence on their environment. Consequently, the Ulu Padas cannot be described as a wilderness, nor its resources as wild. The extent to which the Lundayeh themselves construct the categories of 'wild' and 'cultivated' foods is investigated through examining how these resources are owned, and their different roles in the diet. These data suggest that the Lundayeh recognise that there is no simple dichotomy of 'wild' and 'cultivated', but rather, that there is a gradation between these two categories. There is also evidence to suggest that the Lundayeh do not consider any resources as wild, in the sense of being uninfluenced by people.

The environmental perceptions of the Lundayeh are also investigated, and how these have been shaped by their particular way of life, history, beliefs and knowledge systems. It is apparent that for the Lundayeh, the Ulu Padas is a cultural landscape. However, this is changing, as a result of recent social and environmental changes. This thesis concludes by examining the impact of changing perceptions on how the Lundayeh are managing their environment, and on their attitudes towards conservation.

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CHAPTER 1: INTRODUCTION

1: 1. Research aims and objectives

This thesis provides an account of the subsistence system of the Lundayeh of Long Pasia and Long Mio at the end of the twentieth century. I focus particularly on their food resources and diet, describing the diversity of resources used and the importance of forest foods in the diet. I also investigate the resource use and management practices of the Lundayeh, and how these are changing. This research is placed in the context of central Borneo by comparing my own findings with those of researchers who have done similar studies elsewhere in the region. Although no research on diet and use of forest resources has previously been published on the Lundayeh, similar research has been conducted with other peoples, most notably the Kantu' (Dove, 1985), Kelabit (Christensen, 1997; Janowski, 1993), Iban (Christensen, 1997), and Kenyah (Chin, 1985; Colfer et al., 1997).

Using these data on Lundayeh food and diet, I address some wider theoretical questions. The main question to be addressed is whether the concepts of 'wild' and of 'wilderness' are meaningful, either analytically or for the Lundayeh. The term 'wild' (as applied to foods, plants or other resources) has typically been used in contrast to 'cultivated'. I investigate the usefulness of these concepts by looking at the way in which the Lundayeh manipulate and manage their resources, and thus, the impact that they have had on their resources and environment. In addressing this, I consider the question of how forest and resource management can be defined, in particular, whether management has to be consciously recognised by people in order to be so defined.

I also investigate the extent to which the Lundayeh themselves construct the categories of 'wild' and 'cultivated' foods, based on evidence from their different roles in the diet and the way these foods are shared. Following on from this, I investigate the environmental perceptions of the Lundayeh. The way people engage with their surroundings determines what features they encounter and perceive, and their understanding of the environment. Therefore, I investigate how Lundayeh perceptions have been shaped by their way of life, history, beliefs and knowledge

systems. On this basis, I consider whether the Lundayeh view of the Ulu Padas is of a wilderness or a cultural landscape.

The issue of whether 'wild' and 'wilderness' are meaningful concepts is not only of theoretical interest. It also has wider consequences, most significantly in influencing conservation and development agendas. This becomes apparent from examining the environmental perceptions of those working in these fields, such as government bodies and conservation organisations. I describe the perceptions of those organisations that have been involved in the Ulu Padas, and consider the significance of these various perspectives for conservation and development. In particular, I analyse how local perspectives influence people's management of resources and attitudes towards conservation. The Lundayeh are currently experiencing rapid changes to their way of life and to their environment. I consider how these changes are influencing people's perceptions and attitudes towards the environment.

1: 2. Theoretical background

Before discussing the theoretical background to this research, I will begin with some definitions of the main concepts to be addressed in this thesis in order to set the context. Further details of these, in addition to discussion of the literature and main debates relating to these concepts, are given later in the thesis. The main concepts to be considered are 'wild', 'wilderness', 'landscape', 'management' and 'perception'.

The term 'wild' can be used in a variety of ways. As the Oxford English Dictionary (Simpson & Weiner, 1989) defines it, 'wild' can be used to refer to: animals that are 'not tame, not domesticated; plants 'growing in a state of nature; not cultivated'; a place or region that is 'uncultivated or uninhabited'; something that is 'belonging to or characteristic of a wild region; of or in a wilderness'; and also to people who are 'uncivilized, savage'. In this thesis I am interested in its use to describe resources, both plant and animal, and also environments, as in the term 'wilderness'.

The term 'wild resources' is usually taken to mean plants and animals that have not been cultivated or domesticated (Etkin, 1994; Harris, 1989). One problem with this usage is the implication that such resources have been uninfluenced by people, for

example, genetically or ecologically. However, this is often not the case, as I describe in detail in chapter four. Similar issues are raised by the term 'wilderness'. To resort once more to the Oxford English Dictionary, this defines 'wilderness' as 'a wild or uncultivated region or tract of land, uninhabited, or inhabited only by wild animals'. Vast areas of forest, and other environments, have been described as wilderness, as I describe for Borneo in chapter four. However, as has increasingly been recognised (Padoch & Peluso, 1996), many of these so-called wilderness areas do have people living within them, and often they have had a profound impact on their environment.

The question of how to define 'wild' and 'wilderness' is partly linked to that of how we define 'management', since if something is managed, this implies that it is not wild. However, the question as to what is a managed resource and what is management is a difficult one. Usually implicit within a definition of management is that it refers to an action that involves conscious planning for the future. Often it is very narrowly applied, for example, only referring to very obvious management strategies, such as cultivation of plants in fields. However, in more recent years, a number of researchers have drawn attention to the fact that much management of plant resources goes on outside of fields and farms, and that habitats may be managed in ways not previously recognised (Alcorn, 1981; Balée, 1994). For example, plant resources may be pruned, weeded, or selectively felled, while forests may be subject to enrichment planting, clearing or protection. I consider how to define management in section 4: 5: 1.

Describing a landscape as a 'wilderness' reflects one perception of that landscape – albeit often a mistaken one. By perception of the environment, I refer to how people discern and understand their surroundings. Just how to define 'perception' is a problematic issue, and this has been the subject of much debate within the fields of both psychology and philosophy (Segal et al., 1966). One definition of perception, that of the psychologist Gibson, writing in 1979, is that it is 'an active and exploratory process of information pickup' (Ingold, 2000: 166). Therefore, perception of the environment relates to how people discern their environment through their senses – through seeing, smelling, feeling, tasting and hearing. However, perception does not only relate to direct experience, but also to what

people learn from other sources, for example, what is taught to them by others of their own society, in school, from T.V. and other media, and so forth. If we accept Gibson's view of perception as an 'exploratory' process, it follows from this that people's perception will vary depending on the way in which they interact with their environment, for example, whether they are farmers, hunters, tourists, researchers... In chapter five, I discuss some of the differing perceptions of the Ulu Padas landscape.

One concept remains to be defined, and that is 'landscape'. One definition of landscape is that it is 'the material manifestation of the relation between humans and the environment' (Crumley, 1994: 6). Thus, it includes the meanings that people ascribe to the environment, and the various kinds of knowledge (for example, stories, ecological knowledge, beliefs and myths) that are associated with it. As I describe in chapter five, there has been a shift away from a view of the landscape as something neutral and passive. Rather, the landscape is recognised as being inter-twined with people, each influencing and shaping the other. This shift in ideas has also been paralleled in studies of environmental perceptions (Ingold, 2000). Thus, it is now recognised that 'people's perceptions of their world and their material engagement with it are intimately bound together and creative of, as well as created by, the landscape.' (Bender, 1996: 323) Let us now consider in more detail some of the theoretical developments that have contributed to current ideas about these various concepts.

The theoretical background to this project lies in the overlapping fields of archaeobotany, historical ecology and ethnobiology. In this section, I describe some of the developments in these areas as they relate to the issues addressed in this thesis. In particular, I consider how the concepts of 'wild' and of 'wilderness' have come to be challenged.

Let us begin from the perspective of archaeobotany. One field of research that has fed into the development of these ideas is that on the origins of agriculture, and in particular, the process of plant and animal domestication. Researchers had long assumed that the transition from hunting and gathering (and the use of wild foods) to agriculture (and the use of cultivated and domesticated plants and animals) was a

relatively abrupt one. Implicit in such models was the assumption that a clear distinction exists between hunter-gatherer societies and agriculturalists (Harris, 1989). However, in the 1960's, evolutionary and ecological models were proposed to describe the development and adoption of agriculture (Harris, 1969). These models indicated that such a shift may have been more gradual. Furthermore, they highlighted the variety of ways in which people interact with plants, suggesting that modes of subsistence can rarely be classified as simply 'agriculture' or 'gathering'. These theories challenged the overly-simplistic dichotomies of wild and cultivated resources and environments, and of hunter-gatherers and farmers. Thus, it was recognised that these opposing pairs are not discrete categories. Rather, these categories encompass points on a continuum along which there are a multitude of types, strategies and varieties. I talk about the development of these ideas in more detail in chapter four, when I discuss the concepts of 'wild' and 'cultivated' with reference to my own data.

These ideas have been further developed through insights gained from ethnobiological research. One notable study is Alcorn's (1981) investigation of the plant management practices of the Huastec of Mexico. This highlights the diversity of types of plant manipulation undertaken by the Huastec, showing that plant resources cannot be categorised simply as domesticates, weeds or wild plants. This research also demonstrates how focusing only on fields and gardens, a tendency in many studies of agricultural and subsistence systems, gives too narrow a perspective. For example, gardens are often difficult to delineate, and manipulation or management of plants often takes place outside these defined areas.

One outcome of Alcorn's research was to challenge the pervasive view of 'spontaneous vegetation...[as] a passive backdrop against which human activities occur' (1981: 402). The fact that this is not so, and that humans have often had an important role in shaping their environment, has slowly gained recognition. Much of the early work that produced further evidence in support of this view was conducted in the Amazonian region. Most notable amongst this has been the work of Balée and Posey on the Ka'apor (Balée, 1994) and Kayapó (Posey, 1985). These authors provide evidence for the anthropogenic nature of these people's environments, which previously had been presumed to be pristine forest unaffected by human influence.

Their research not only challenges the idea of forest as 'wilderness', but also of forest resources as 'wild' (Posey, 1998). Their findings suggest that Ka'apor and Kayapó practices actually enhance environmental and biological diversity, challenging a widespread assumption that people are inherently destructive of their environment. Therefore, it was suggested that many of the practices previously described simply as 'resource use' or 'extraction' activities might better be described as management strategies (Posey & Balée, 1989).

Another influential body of work in historical ecology has been that of Fairhead and Leach (1996, 1998). This has been important, not simply because it critiques the accepted views of much that has been written on West African ecology, but because the underlying reasons why the landscape had been 'misread' are identified. Their findings suggest that representations of West African forests by academics and government officials had been based on mistaken assumptions regarding environmental change. Their evidence comes from careful analysis of historical data, together with in-depth investigation of local people's management practices and understandings of environmental change. It suggests that rather than people having been responsible for deforestation throughout the region, as had long been assumed, in many instances they had actually had a role in re-forestation. Fairhead and Leach (1998: 185-186) suggest that one cause of this misreading of the landscape has been the fact that ecological theory has been based on an equilibrium model. According to this model, environments are assumed to be heading towards a climax vegetation type, or in other words, a natural equilibrium. The effect of people is presumed to be destructive, disrupting this process. Such a model denies that people can have a positive role in shaping their landscape. Thus, in the West African environments, forest was assumed to be the climax vegetation and so was regarded as pristine. In contrast to this, savannah vegetation was assumed to be the result of forest degradation at the hands of local people.

In recent years ecologists have been questioning the applicability of the equilibrium model. For example, it has been suggested that most ecosystems may in fact be unstable, having a tendency 'to oscillate or deviate away from theoretical equlibria' (Vandermeer, 1996: 286). Furthermore, the importance of history has come to be recognised, in particular, with recognition that random events may have a major role

in shaping ecosystems (Putman, 1994). Thus, ecologists have begun to interpret forest composition in terms of the 'unique pathways which led to it' (Fairhead & Leach, 1998: 186). However, while many ecologists have begun to consider the history of climatic and ecological events, the influences and legacies of people's land-use and management strategies are still widely ignored, and people's history in the environment continues to be denied.

Fairhead and Leach have suggested that another factor has had a role to play in hindering our understanding, not only of West African ecology, but also more widely. This is the fact that within ecological studies, and more generally in Western science, natural and social phenomena have been conceptualised as being of a different order, and so, are investigated separately (Fairhead & Leach, 1996: 5-7). Thus, ecologists typically have looked at an environment and analysed the effects of man and of 'natural' processes separately. Such a division has not been confined to ecology. Within anthropology and the field of cultural ecology, there has been a tendency to separate man from his environment, in part because these disciplines have been locked into a nature / culture dichotomy. Such views have led to overly simplistic explanations for societies' environmental relations, as typified by the theories of cultural materialism and environmental determinism.

Such approaches have now been widely critiqued (Descola & Pálsson, 1996; Ellen & Fukui, 1996) with the undermining of the nature / culture dichotomy, and with increasing recognition of the integral nature of people and their environment. Research into landscapes and environmental perceptions has contributed to this latter shift. Thus, the dominant western perspective in which the landscape is regarded as a background against which people act has been challenged. Rather, a 'dwelling' perspective has been proposed (Ingold, 2000: 153; Tilley, 1994: 13). According to such a perspective, not only are people an integral part of the landscape, but the two are created and formed together. In other words, the landscape should be viewed as a process involving an 'unfolding' of relations between people and their environment (Ingold, 1993: 156), or as a 'cultural process' (Hirsch, 1995: 22). I describe these ideas in more detail in chapter five.

To summarise, the main shifts in theory and ideas that have led us to the present emerging consensus are, following Balée (1998: 14), that:

- a historical perspective is necessary in the study of landscapes, resource use practices and the relationships between people and the environment;
- societies and their environments are intertwined, and should be understood as total phenomena;
- much, if not all, of the biosphere has been affected by human activity;
- human activity may increase biodiversity.

It remains for me to describe how these ideas have been applied in Southeast Asia. Although much of the early work in historical ecology was conducted in Amazonia, the ideas developed here have built on similar developments in the field of environmental history in Southeast Asia. Important early works were those of Conklin (1954) and Freeman (1955) who focused on synchronic studies of swidden agricultural systems. Similarly, Geertz (1963) and Fox (1977) investigated processes of change in subsistence systems in their research in Indonesia. In recent years, Southeast Asian environmental histories have begun to be re-examined by geographers, historians, and anthropologists (e.g. Boomgaard et al., 1997; Brookfield et al., 1996; Wadley, 1997), albeit without the same ethnobotanical emphasis found in the historical ecology research conducted in South America. Much of the recent work that takes an ethnobiological approach has focussed on agricultural and subsistence systems. Most notable among these has been the work of Dove (1985), Padoch et al. (1998) and Peluso (1992). These, and others, have all taken a historical perspective, focusing in particular on changes in subsistence systems, and highlighting the integral nature of agriculture and forest use. In particular, such works have aimed at giving accurate analyses of the impact of swidden activities on the forest and landscape, questioning the prior assumption that they are necessarily destructive.

Most recently, the developments made in academia have been applied in the field of natural resource management and conservation. In particular, there has been widening recognition of the need for a historical perspective when trying to understand local management systems and integrate these into conservation projects (Eghenter, 2000; Horowitz, 1998). Furthermore, the implications of denying local

peoples' role in managing their resources and shaping the landscape in addressing issues such as land rights and management of resources has been recognised. Thus, the persistent use of the concepts of 'wild' and of 'wilderness', one reflection of this, has been increasingly challenged with evidence from local people's management systems, perceptions and histories (Brosius, 1986; Peluso, 1996; Tsing, 1993). These matters are returned to in the final chapter of this thesis.

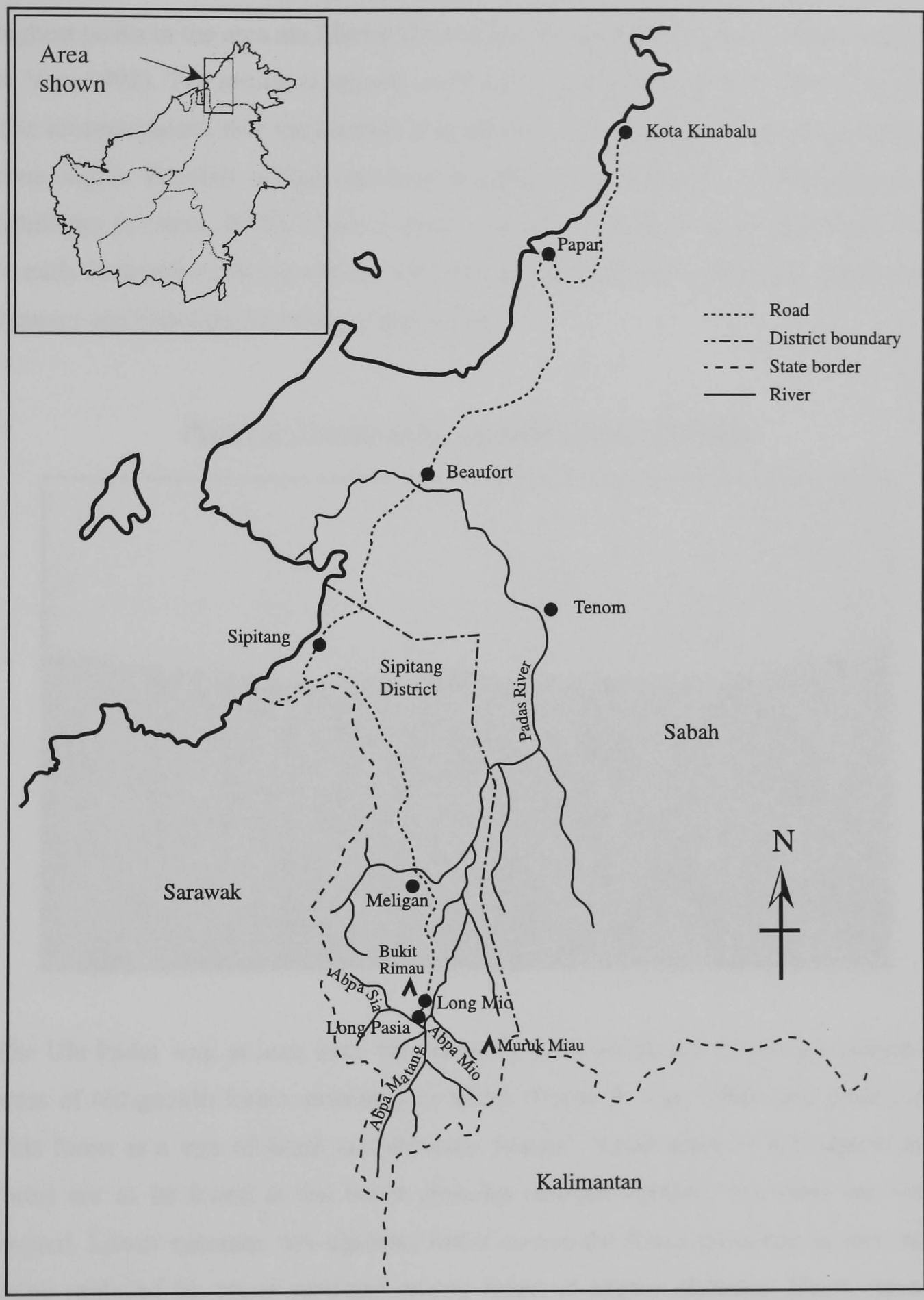
1: 3. The geographical context

The villages of Long Pasia and Long Mio are situated in the far southwest corner of Sabah (figure 1.1). Administratively, the villages lie within Sipitang District. Thus, it is in the town of Sipitang that the local government offices are found, the main police station for the district, and the hospital. Bio-geographically, however, the villages are in the Ulu Padas region. This refers to the headwaters (*ulu*, in Malay) of the Padas River, a region that extends to the borders of Sarawak and Kalimantan.

Plate 1.1: Confluence of the Matang and Sia Rivers at Long Pasia

The Lundayeh call the Padas River, Abpa Matang, *abpa* meaning 'river' or 'water'. Long Pasia is situated where the Abpa Sia (or 'Pa Sia) meets the Matang, the Lundayeh word *long* meaning river confluence (see plate 1.1). Long Mio is near to

Figure 1.1: Location of Long Mio and Long Pasia



the Abpa Mio confluence, further downstream. The villages are at an altitude of 1000m, and are surrounded by undulating hills, and beyond these, mountains. The highest peaks in the area are Muruk Miau (2084m) and Bukit Rimau (1909m) (Payne & Vaz, 1998). The terrain is mountainous, with many rivers, gorges and waterfalls. The altitude means that the climate is relatively cool, the nights becoming cold on clear nights. Rainfall is high, estimates ranging from 2000mm to 3500mm a year (Phillipps & Lamb, 1998). There is some seasonal variation, it being drier from July to early September (the time when rice fields are burned before planting), and also in January and February (the time of harvesting).

Plate 1.2: The mountainous terrain of the Ulu Padas

The Ulu Padas was, at least until very recently, covered by one of the last extensive areas of old-growth forest remaining in Sabah (Payne & Vaz, 1998) (see plate 1.2). This forest is a mix of heath and montane forests[1]. Small areas of hill dipterocarp forest are to be found at the lower altitudes (around 1000m), but these are very limited. Lower montane oak-chestnut forest covers the lower mountain slopes, this being replaced by upper montane mossy forest at higher altitudes. Heath forests (widely referred to as *kerangas* forest in the Malaysian literature) are numerous, but nowhere very extensive, occurring on patches of poor, sandy soils. Some areas of riverine forest occur along the upper reaches of the Matang and Sia rivers. Long

Pasia and Long Mio are situated on old alluvial flood plains, and surrounded by a mosaic of fields and secondary forest of varying ages, a consequence of people's long history in the region, and their practice of swidden agriculture.

Until recently the region was relatively isolated, a logging road reaching Long Mio in 1994 and Long Pasia in 1997. When the road only reached as far as Long Mio, travel to Sipitang involved an hour's walk or a boat journey for the people of Long Pasia, followed by a five hour car journey (in dry weather). Ten years prior to this, it would take a day's walk to reach the village of Meligan, from where a vehicle could then be taken to town. Alternatively, a flight could be taken to Lawas. In about 1985, the Malaysian Airline Service (MAS) began running a weekly flight (depending on the weather) to Long Pasia. This service was halted in 1998 because of low demand, a consequence of the improving road link.

Logging activities have brought many changes to the region, particularly in the last five years. The land immediately surrounding the two villages, an area of 12,300ha, is State Land. Such land is, by default, owned by the Sabah Government, although people can apply for land title. Indeed, most of this area is either under application, or in a very few cases, title has been granted. This area was designated as State Land in the 1980s. Beyond this lies Commercial Forest Reserve, which means that it is available for commercial timber extraction. Indeed, under agreements with Sabah Forest Industries Sdn. Bhd. (SFI), much of this land has been designated either for conversion to industrial tree plantations or for timber harvesting. Small areas (totalling 9,653 hectares) are protected, having been designated as Virgin Jungle Reserve (Payne & Vaz, 1998). The classification of land in the region is shown in figure 1.2. Logging activities are taking place throughout the Forest Reserve, with logging in the southern portions, in the vicinity of the villages, since 1998. Extension of the logging road upstream of Long Pasia took place at the beginning of my fieldwork period, and a year later there had been extensive logging.

Until the time of my research, forest resources were still readily available to local people, and they still depend to a large extent on these. This has been encouraged by

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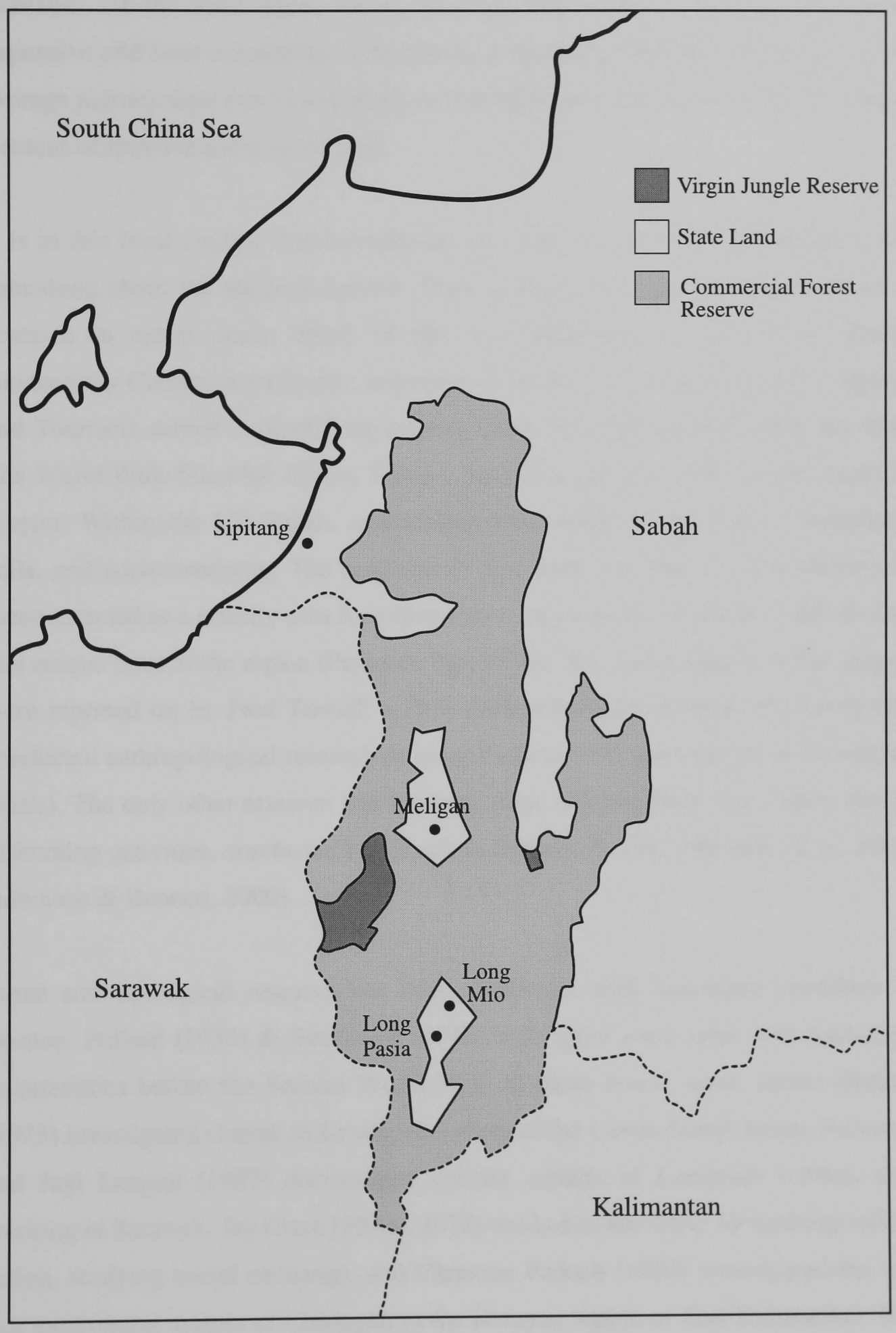
[1] For a detailed description of the region's forest types and their botanical composition, see Phillips & Lamb (1998).

Figure 1.2: Land classification in the Ulu Padas
(Source: Payne & Vaz, 1998)



the relative isolation of the region. However, this situation is rapidly changing, largely because of logging. Today, forest resources are becoming less readily available. At the same time, access to town and markets, while still relatively expensive and time consuming, is becoming ever easier. During my time there, the average journey time from Long Pasia to Sipitang decreased from five to four hours because of improvements in the road.

It is in this local context that I conducted my work, but it is also necessary to say something about the research context. The Ulu Padas has been the subject of some research in recent years. Much of this was undertaken as part of the Sabah Biodiversity Conservation Project (a project of the Ministry of Culture, Environment and Tourism), aimed at identifying priority areas for conservation within the state. The World Wide Fund for Nature, WWF – Malaysia, carried out the research for this project. Within the Ulu Padas, assessments were made of the botany, hydrology, soils, and socio-economy. The outcome of this work was that the Ulu Padas was recommended as a priority area for conservation, in particular, because of the diverse and unique flora of the region (Payne & Vaz, 1998). The social aspects of this project were reported on by Paul Towell, a PhD student from Manchester University. He conducted anthropological research in Long Pasia in 1997 (and has yet to submit his thesis). The only other research that has been done in Long Pasia was a short survey of hunting activities, conducted by Elizabeth Bennett in 1993 (Bennett et al., 1995; Robinson & Bennett, 2000).

Some anthropological research has been conducted with Lundayeh elsewhere in Borneo. Pollard (1933) & Southwell (1949) both spent some time with Lundayeh communities before the Second World War. In more recent years, James Deegan (1973) investigated change in Lundayeh society in the Lawas Damit Basin, Sarawak, and Jayl Langub (1987) documented various aspects of Lundayeh culture, also working in Sarawak. Jay Crain (1970a, 1978) worked in the lower Mengalong valley, Sabah, studying social exchange, and Christine Padoch (1986) investigated the wet rice agricultural system of Lundayeh in the Kerayan region of East Kalimantan. It is to the ethnography of the Lundayeh that I now turn.

1: 4: 1. Lundayeh language and distribution

The Lundayeh live in northern central Borneo where the borders of Sabah, Sarawak and East Kalimantan meet. The heartland of this people is the Kerayan-Kelabit highlands of East Kalimantan, this being the area from where the Lundayeh are thought to have originated. This is both according to Lundayeh oral histories, and the accounts of researchers (Harrisson, 1967; Schneeberger, 1945). From here, the Lundayeh migrated to Sarawak, Sabah, and in small numbers, to Brunei.

The distribution of the Lundayeh across four states has contributed to some confusion in the literature, because of the use of different ethnic names in each of these[2]. Thus, they have been variously referred to as Lun Bawang, Lundayeh, Southern Murut, Sarawak Murut, Kemaloh-Kelabit, Kelabitic Murut, Putuk and Dayak (Crain, 1978; Lebar, 1972: 158; Sellato, 1997). The use of the name Murut, in particular, has caused much confusion. This is because the term Murut, in its most widely applied sense, refers to the members of another language family, Idahan Murut, spoken primarily in Sabah. This includes the Lundayeh's neighbours in the Ulu Padas, the Tagal (referred to locally as Murut). Although these two peoples share some cultural characteristics, they are linguistically remote (Lebar, 1972; Martin, 1994).

The Lundayeh are in fact most closely related to their Kelabit neighbours in Sarawak, with whom they share both cultural and linguistic affinities (Janowski, 1987; Saging & Bulan, 1989). Both of these languages belong to the Apo Duat group (Hudson, 1978), also called the Kelabitic Murut language group (Lebar, 1972). The relationships within this group are unclear, Crain (1978: 123) describing it as an 'undefined linguistic and cultural homogeneity'. It includes the languages of the Tabun, Tring, and Sa'ban peoples (Blust, 1984; Clayre, 1992; Martin, 1994), as well as the seven 'Murut dialects' recognised by Southwell (1949). Crain (1970a) made an attempt to correlate these dialects with those recognised by the Lundayeh, the results of which are shown in table 1.1.

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[2] In fact, confusion over ethnic identity has been the norm for all Borneo peoples. This has been the result of the political division of the island, and also because of the complex linguistic and cultural situation (King, 1979; 1982).

Crain's findings largely agree with the explanations I was given by the people of the Ulu Padas. They explained that Lun Lod, Lun Nan Ba and Lun Ilu' (names that refer to the people themselves, as well as the language) are dialects of their own language. The dialect spoken in the Ulu Padas is the most widely distributed, in part because this was the dialect into which the Bible was translated and in which missionaries became fluent. Lebar noted in 1972 that this dialect was becoming widespread as a result of missionary activities.

Table 1.1: The relationship between Southwell's 'Murut Dialects' and Lundayeh isolects (Crain, 1970a: 23)

SOUTHWELL'S 'MURUT DIALECTS':	LUNDAYEH ISOLECTS:	LOCATION:
Pa Ruab	Lun Lod	Lower Trusan, Lawas (Sarawak), Brunei Bay (Brunei).
Pa Brunei	Lun Lod	Limbang River (Sarawak, Brunei).
Ba	Nan Ba	Wet padi areas of Ulu Trusan (Sarawak) & Sesayap watershed (East Kalimantan).
Pa Kemaloh	Lundayeh	Mid-tributaries of Sesayap (East Kalimantan), Ulu Pa Trusan (Sarawak) & Ulu Padas (Sabah).
Long Berang	Lundayeh	Lower Sesayap (East Kalimantan).
Ulu Kerayan	Lun Ilu / Lun Ilau	Upper tributaries of Kerayan (East Kalimantan).
Kelabit	Kelabit	Kelabit plateau (Sarawak).

The people of the Ulu Padas also recognise that the Kelabit language is very similar to their own. However, unlike the other groups, the Kelabit are not regarded as Lundayeh, because of cultural differences (Janowski, 1987). Today then, the people that are recognised as being culturally the same are the Lundayeh, Lun Lod, Lun Nan Ba and Lun Ilu'. In East Kalimantan and Sabah, this group is referred to as the Lundayeh, while in Sarawak, the preferred self-referrent is Lun Bawang. Sellato (1997: 49) has suggested the use of the term Putuk for this group of peoples, because of the bias inherent in the name Lundayeh. He noted that in recent decades there has been a strengthening of local ethnic identities. For example, among the Lun Ba there is a desire to promote their particular identity, and distinguish themselves from the Lundayeh. However, at present, the name Putuk is little known in either Sabah or Sarawak.

I emphasise that this is the situation today, because there is no evidence that such aggregate categories would have been recognised in the past. Rather, people would have regarded themselves as belonging to a particular longhouse, and more inclusively, perhaps to a group of longhouses within a river system (Deegan, 1974). Reflecting this, people referred to themselves by longhouse or by river valley, and not by an ethnic grouping (Harrisson, 1959a; Lebar, 1972). In fact, the river was probably a stronger unit than the ethnic group for all central Borneo peoples, with marital and economic exchanges, warfare and other forms of political activity taking place primarily within a river basin (Rousseau, 1989). Thus, there was no sense of a larger Lundayeh cultural group. This only developed in the twentieth century as a result of increasing contact between various Lundayeh groups (Crain, 1978), and also with the influence of the church which acted as a unifying force (Deegan, 1973: 284-286).

As I mentioned above, the Lundayeh regard the Kerayan-Kelabit highlands as their heartland, and furthermore, regard themselves as essentially a highland people. Even those who live in the lowlands recognise their roots in the highlands. This is reflected in their name, *lun* meaning people, and *dayeh* meaning upriver or headwaters. I should also explain here the meanings behind the names of the various Lundayeh groups or dialects. The word *lod* means downriver, thus, Lun Lod are people of the lowlands, or more literally, downriver[3]. Lun Nan Ba means people who have (*nan*) wet rice fields (*ba*), the main form of rice agriculture of this group[4]. The origin of the name Lun Ilau or Lun Ilu' is less clear, but is thought to refer to the main river along which these people live, the Ilau river (Crain, 1970a: 30-31). In the Ulu Padas, they are called Lengilu, a name derived from that of the river confluence (*leng* or *long* meaning river confluence) (Ganang, unpubl.). The word *bawang* means village, town or a particular place. Therefore, Lun Bawang means people of the village, or local people. In fact, the phrase *lun bawang* is not just used as an endonym by the people

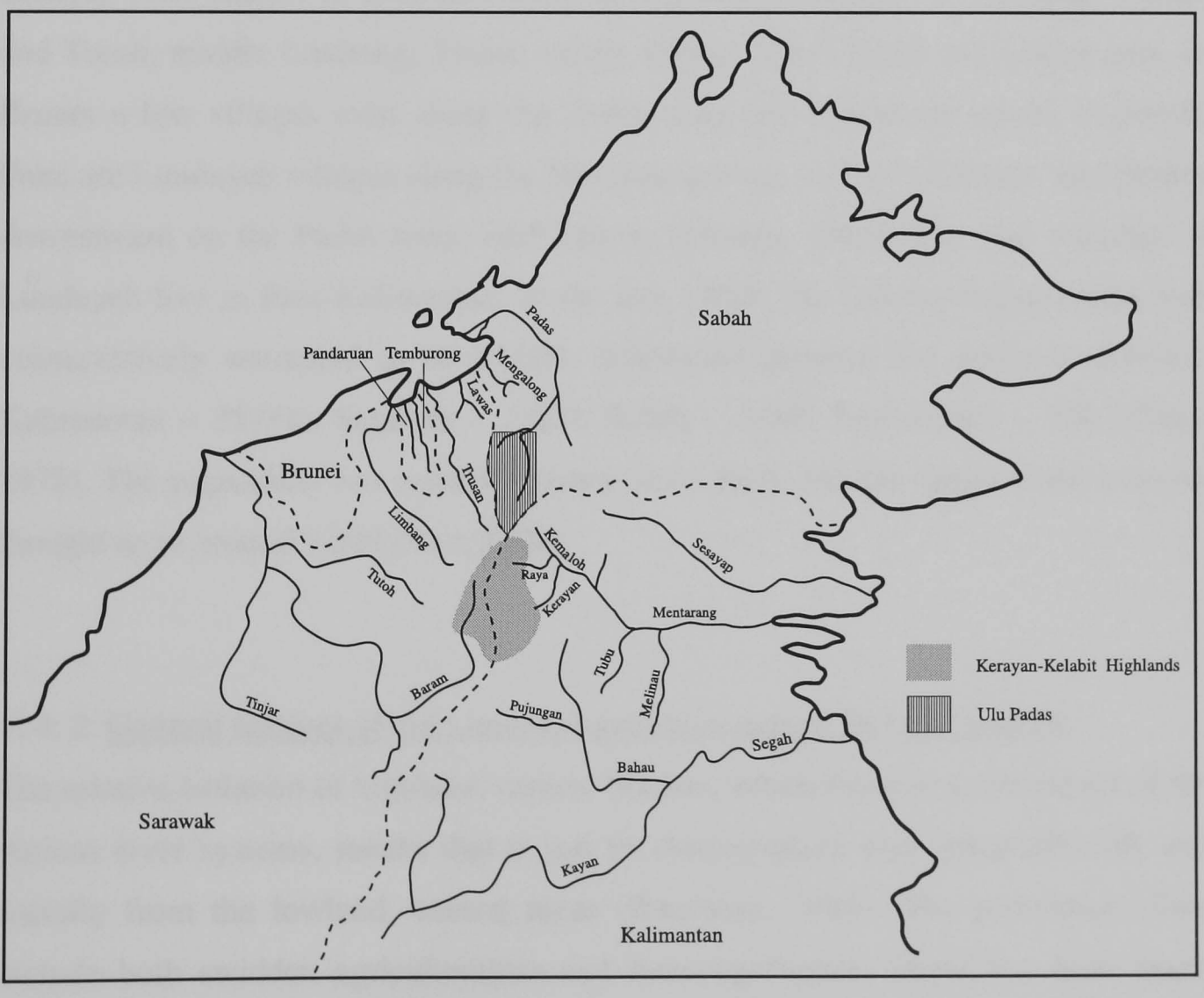
[3] The name Lun Lod is only used to refer to early migrants to the lowlands, and not to those people who migrated in the twentieth century (Langub, 1987).

[4] The people of the Ulu Padas themselves use this name more restrictedly than either Southwell or Crain, to refer to people from a region of the Kerayan highlands where only wet rice is cultivated. This is in agreement with the findings of Padoch (1985) who reports that Nan Ba is the name of a valley in the Kerayan where wet rice is cultivated almost exclusively, as it has been for many generations.

of Sarawak, but also more generally to refer to the original inhabitants of a village or region, in contrast to newcomers and outsiders.

For the Lundayeh (Crain, 1970a: 29), as for all other Borneo societies (Eghenter, 1999; Padoch, 1982), migration has been prevalent throughout their known history. The time when the Lundayeh's ancestors first inhabited the Kerayan-Kelabit highlands are uncertain (figure 1.3). Sellato (1997), using evidence from oral histories, has suggested that these people moved into the highlands fairly recently, migrating from the lowlands in the seventeenth century. The prevailing theory prior to this was that of Harrisson (1959a), a theory that also ties in more closely with the origin myths of the Kelabit (Janowski, 1987) and the Lundayeh (Harrisson, 1967).

Figure 1.3: Location of the Kerayan-Kelabit highlands



According to both these peoples' myths, their ancestors originated in the Kerayan-Kelabit highlands, and migrated from here. Similarly, Harrisson (quoted in Lebar, 1972: 159) apparently suggested that these highlands were first settled by the

ancestors of the Lundayeh in the 'early centuries of the Christian era', probably from the southeast. In the seventeenth century the Lundayeh moved south and west into the Baram, Limbang and Bahau river systems. Their northward expansion was limited by the Kayan and Kenyah peoples. However, they were able to move down the Trusan into Sarawak, occupying the Lawas Damit valley between 1820 and 1935 (Deegan, 1973: 163-172). The movement of the Lundayeh into Sabah along the Padas river was also relatively recent, taking place over the last 200 years (Deegan, 1970). During the twentieth century this northward migration into Sabah has continued apace because of political and economic changes in Indonesia (Crain, 1970a: 35-38), as I describe in more detail in chapter two.

Today, the Lundayeh are found in East Kalimantan, southeast to the Bahau headwaters, east to the upper Mentarang, and northeast in the Kemaloh, Raya and Sesayap river basins. In Sarawak, there are Lundayeh villages on the upper Baram and Tutoh, middle Limbang, Trusan valley, Lawas Damit basin and Lawas area. In Brunei a few villages exist along the Temburong and Pandaraun rivers. In Sabah, there are Lundayeh villages along the Mengalong river, in the Ulu Padas, and further downstream on the Padas river, near Tenom (Moody, 1984). The vast majority of Lundayeh live in East Kalimantan. In the late 1960s, the Lundayeh population was conservatively estimated to be 34,000, distributed between the states as follows: Kalimantan – 25,000, Sarawak – 7,000, Sabah – 2,000, and Brunei – 300 (Crain, 1978). The population has certainly grown since then, and for Sabah alone is today thought to be around 5,000 (Vaz, 2000).

1: 4: 2. Cultural features of the Lundayeh and other central Borneo peoples

The relative isolation of highland, central Borneo, which lies above the rapids of the various river systems, means that it can be distinguished both geographically and socially from the lowland, coastal areas (Rousseau, 1989). The populations here include both swidden agriculturalists and hunter-gatherers. There has been much interaction between, and integration of, these various peoples, with relationships ranging from trading partnerships, patronage and enslavement to warfare. There has also been a long history of migration within the region. These processes have resulted in complex and overlapping cultural and linguistic patterns. Thus, the

agricultural societies share many social and cultural features, such as settlement patterns, social organisation, burial practices, religious beliefs, and material culture (Rousseau, 1989). However, some of these societies are closer linguistically to nomadic societies than to other agricultural peoples (Rousseau, 1990: 3; Seling & Langub, 1989).

The Lundayeh have much in common with neighbouring swidden agriculturalist societies, including the Kayan, Kenyah and Kenjang. However, as I mentioned above, it is with the Kelabit that they are most closely related, both culturally and linguistically. I will describe here some of the main features of Lundayeh society and culture, highlighting the similarities and differences between the Lundayeh and other central Borneo peoples, in order to place the Lundayeh in their wider ethnographic context.

The Lundayeh are predominantly swidden agriculturalists, although not exclusively so. The development of irrigated rice agriculture alongside shifting cultivation is a distinguishing feature of both the Lundayeh and Kelabit, as is the practice of raising buffalo (Rousseau, 1989; Saging & Bulan, 1989). The origins of wet rice cultivation are unclear, the system differing from that found in the lowlands. The main difference is that it does not depend on a sophisticated irrigation system, nor on major earth-moving. Rather, it makes use of naturally swampy and low-lying areas, and flooding is encouraged by creating bunds out of earth and vegetation (Janowski, 1987; Padoch, 1983; 1985; Sellato, 1997). However, it seems that this was not the only system practised in the highlands, the presence of *sawah*-like fields in the Kerayan being noted in the 1930s (Janowski, unpubl.). In the central highlands, both the Lundayeh and Kelabit have apparently practised wet rice cultivation for several centuries, alongside swidden cultivation (Deegan, 1974; Janowski, unpubl.; Padoch, 1983). For certain groups of Lundayeh, such as the Lun Nan Ba, wet rice is the main form of rice cultivation. This is the case in the region from Ba Kelalan to Long Semadoh in Sarawak (Deegan, 1974), and in the western part of the Kerayan plateau in East Kalimantan (Padoch, 1983; 1985; Sellato, 1997).

In the past, the Lundayeh were ruled by hereditary chiefs, this forming the basis of social stratification. Stratification was also a feature of the Kayan, Kenyah, Kenjang

and Kelabit. In all these societies, a hierarchy of slaves, commoners and aristocrats used to exist. However, the Lundayeh and Kelabit differed in that they were less rigidly stratified than other societies. The chiefs had less control over their followers, and people could move between classes, at least between those of commoner and the ruling class. Since the nineteenth century under the influence of the various state governments, and with the further impact of Christian missionaries at the start of the twentieth century, this system has been in decline. Today, at least among the Lundayeh, it has all but disappeared, although it lingers on in the continuing use of the category *lun do*. This phrase, translating literally as 'good people', used to refer to the aristocracy or ruling class, in contrast to *lun dat*, 'bad people', the slaves and commoners. It is still widely employed to refer to people of wealth, good ancestry, or to those held in high esteem. Indeed, within the villages of the Ulu Padas, those families who dominate the political and social affairs of the village are those with 'good ancestry', being the descendants of *lun do*, and at times, they are still referred to in this way.

Similarities between the Lundayeh and other central Borneo societies are also apparent in settlement patterns. The river system has had a central role in influencing patterns of both movement and settlement. People migrated and settled along rivers, a section of a river basin forming a village's territory. A village was typically a longhouse, or sometimes several longhouses. For most Borneo peoples, villages were usually between 150 and 350 people, although they could be as large as 1000 people (Rousseau, 1989). Lundayeh villages tended to be small, of 50 to 250 people (Deegan, 1974). For central Borneo societies, the longhouse, and the individual households of which it was composed, were more important than kinship for social organisation. In particular, the household was the social, economic and religious unit. Thus, the household owned property, functioned as a unit of agricultural production, and engaged in ritual activity. Among the Lundayeh, a household consisted of a family of between 1 and 4 generations. After marriage, a newly wed couple usually lived for a short while with one of their parents, either the wife's or husband's family, before moving into their own apartment or establishing a new longhouse.

The household continues to be of central importance today, but increasingly, fewer people are choosing to live in longhouses, at least among the Lundayeh. By the late

1960s, Crain (1970b) reports that over half the Lundayeh families in Sipitang District were living in individual family houses, rather than longhouses. The same pattern was observed in Sarawak, where Deegan (1973) noted that longhouses were being replaced by single family dwellings in the 1970s. In Sabah today, one longhouse remains in Kaban, a village in the lowlands near Sipitang. In Long Pasia there is a two-door longhouse house. (This hardly seems to justify the name 'longhouse', but it is referred to as such within the village.) A few longhouses are still to be found in Sarawak and Kalimantan, but the majority of people have moved into single family houses. This shift took place as a result of a number of factors. Encouragement from the government had an important role, which encouraged people to build individual houses through financial incentives, supposedly in the interests of better hygiene and safety from fires. In addition, the cessation of headhunting made this change possible, as there was no longer the need for defence from attack.

Warfare and headhunting have played an important part in the social organisation, religion and worldview of societies throughout central Borneo. The Lundayeh, in common with other societies, conducted headhunting both for religious purposes and for individual prestige. Warfare was undertaken to subjugate a group, take part of its territory and to capture slaves (Rousseau, 1989). These practices had largely died out by the turn of the nineteenth century (Deegan, 1974).

There are a number of other features common to central Borneo societies, which I will touch on only briefly. The Lundayeh and their neighbouring societies shared similarities in styles of clothing, body adornments, such as beads, and transformations of the body, most notably tattoos (Rousseau, 1989). Beads have been an important item of trade through much of Borneo, and were an important form of wealth. Other items of prestige, again common to many Borneo societies, were gongs, jars and swords. Burial practices were more varied, but a number of societies practiced secondary burial, including the Lundayeh and the Kelabit (Rousseau, 1989). There were also many common features in people's religious beliefs, most notably a widespread belief in augury and omens (Harrisson, 1960; Seling & Langub, 1989). Many of the practices and beliefs once characteristic of central Borneo societies have died out. The widespread conversion of people to Christianity at the start of the twentieth century was central in this. The vast majority of

Lundayeh today are Christians, those in Sabah and Sarawak belonging to the SIB church (*Sidang Injil Borneo,* Evangelical Church of Borneo), and in Kalimantan, to the GKII church (*Gereja Kemah Injil Indonesia*, Evangelical Church of Indonesia). I mentioned earlier that Christianity contributed to the creation of a concept of a Lundayeh people. Similarly, Christianity seems to have had a role in maintaining the distinction between the highland people of central Borneo, who are mostly Christian, with the lowland peoples, where Islam is predominant.

1: 5. Methodology

My fieldwork was conducted in the Lundayeh communities of Long Pasia and Long Mio, situated in the Ulu Padas, southwest Sabah (plates 1.3 and 1.4). I lived there from September 1999 until November 2000. I spent most of my time in the village of Long Pasia. This was the village in which I was based, but every month I stayed in Long Mio for a period of between 7 and 10 days. In Long Mio I lived with 5 different families, while in Long Pasia I lived with 8 families, spending just over a month in each household.

Much of the data come from my direct observations and from informal conversations as I joined people in their everyday activities – hunting trips, agricultural activities, gathering vegetables, socialising in the village. Through observing the ways in which people interacted with their environment and utilised plant and animal resources, I was able to investigate people's perceptions of their environment. In particular, I observed the different rules and behaviour relating to people's practices, and noted their explanations for these. I also undertook more formal data gathering. There were four aspects to this: making plant collections of food resources; conducting hunting and dietary surveys; holding interviews and community discussions; and undertaking mapping exercises.

Plant collecting expeditions were regularly organised. These were conducted in the areas surrounding the villages with people from the villages. I asked people to tell me about the plant resources that they used, saying that I was particularly interested in those used for food. I collected specimens of plant species used as vegetables, fruits, spices, leaves for wrapping rice, cooking containers, as well as plants that are used to

Plate 1.3: Long Pasia

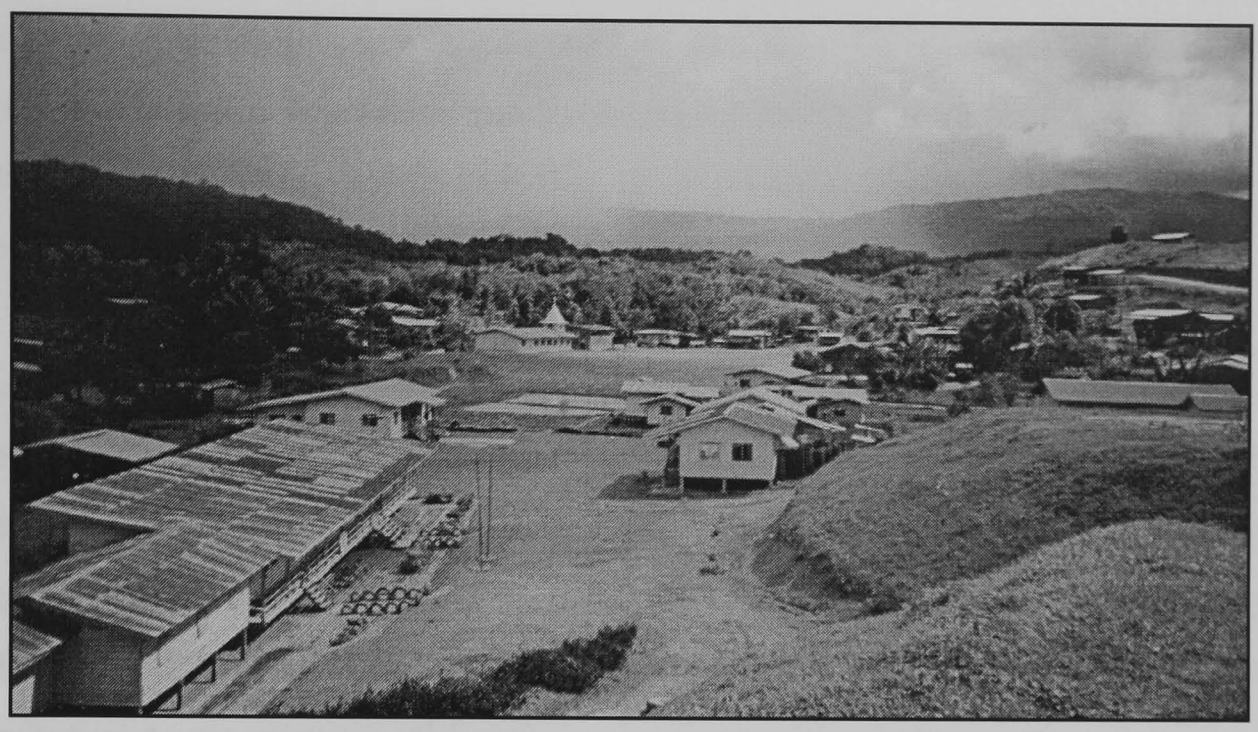


Plate 1.4: Long Mio

obtain food, for example, to make fishing nets, animal traps, fish poisons and hunting charms. Various other resources were also identified in the field without collecting specimens, including some medicinal plants, dyes, weaving and construction materials. Common vegetables and fruits were identified with the aid of illustrated books (Chin & Yong, 1980; Poh Tin et al., 1991), and Sabah Parks staff also provided some identifications from photographs.

A variety of people accompanied me on collecting trips: the young, elderly, men and women. This was something that I encouraged, so that I could get an idea of the distribution of knowledge about edible plants and to build up a full picture of resource use by the villagers. As a result of these collecting trips, I made 327 herbarium collections. Three duplicates were made of each specimen for later distribution to the herbaria of Sabah Parks, Forest Research Institute Malaysia, and the Royal Botanic Gardens, Kew. A partial set of specimens was also collected for the University of Kent at Canterbury's Ethnobiology Laboratory. The identifications were made by myself, with the help of the staff of Sabah Parks and Kew herbaria.

Hunting and dietary surveys were conducted in each of the two villages for five periods of one week, in November/December 1999, January/February, March/April, July/August, and September/October 2000. For these, I asked an adult from each household to record all the foods eaten within the house. I also asked them to record the sources of these foods, and the number and types of animals and fish hunted or caught. During one survey, I asked the children to keep their own food diaries, to enable a comparison to be made with that of the adults. In addition, I kept a diary of all the foods eaten in the households where I stayed. This diary gave me almost complete dietary records for the periods that I stayed with these families. I describe this aspect of my work in more detail, including an analysis of my methodology, in chapter four.

In order to investigate hunting success, I observed the hunting activities of five households in each of the villages over several weekly periods. I recorded the number of times that a member of the household went hunting, the number of people who took part, the duration of the trip (estimated to the nearest half day), and what animals were caught. These surveys were undertaken while I was staying in the

households in question. In Long Pasia, observations were made over a total period of 97 days, during which 31 hunting trips were made. In Long Mio, I recorded 9 trips over 40 days. Animals and birds were identified with the use of illustrated books (Francis, 1998; Payne et al., 1994). Using photographs that I had taken, fish species were identified by Sabah Parks staff, and some of the edible insects were identified by Arthur Chung of the Forest Research Centre, Sabah Forestry Department.

In addition to the conversations that were engaged in throughout the research period, I held long interviews with the elderly members of the communities of Long Pasia and Long Mio. These interviews were conducted in the last three months of my research, by which time I was able to converse easily in Lundayeh[5]. I interviewed seven men and two women from Long Pasia, and four men and three women in Long Mio. These accounted for nearly all of the very elderly members of the population. I was also able to conduct two additional interviews with an elderly Lundayeh man and woman, currently living in Renau-Renau and Sri Menanti respectively, villages close to Sipitang. The oldest people with whom I spoke were probably in their 70s, and so were able to recall some 60 years back. In addition, they were sometimes able to tell me things from an earlier date, based on what they had been told by their own parents. The interviews were conducted informally, in order to encourage relaxed conversation, often taking place in the evenings and over a number of occasions. Thus, I had no set questions, although I directed the conversation to cover certain topics. I asked about the way of life when they were young, and how this had changed during their lifetimes. I enquired about the diet, use of forest resources, hunting and farming practises. Food taboos and prohibitions were a particular subject of discussion. I also asked about the belief system prior to people's conversion to Christianity. In addition, I asked people to recount myths (*buek*, *mumuh*), legends (*laba'*) and other stories.

Several large group meetings were held in the two villages, to discuss in further detail certain aspects of my research. I held a total of three sessions each with the men and women, and two sessions with the school children. During these meetings I

[5] At the start of my fieldwork I conversed in Malay, which I could speak to a basic level, and in which all the villagers, except the very elderly, are fluent. During the course of the year I learnt Lundayeh, in which I became proficient.

asked people to identify edible plants from photographs, in order to check the information I had already collected about names and uses, and to get an idea of the variation in people's knowledge. In addition, I asked about people's views regarding food and health, sustainability of harvesting, and how people's food and diet has changed during their lifetimes. A number of mapping exercises were undertaken. I asked both the men and women to draw maps for me showing the most important areas used by them for hunting, fishing and the harvesting of plant foods. In addition, I asked them to map the local names of places and sites of cultural significance (for example, burial sites, old village sites, earthen mounds). These were each drawn by one individual, with the guidance of the rest of the group. In Long Mio, eight women and fourteen men participated, and in Long Pasia, eighteen women and twenty-one men.

I also participated in a series of workshops organised by WWF to investigate the potential for future collaboration of the villages in conservation projects. One aspect of these workshops was to identify how local people, and outsiders, use and value the environment of the Ulu Padas. I describe this process in detail in chapter five.

1: 6. Thesis overview

The current chapter describes the background to this research, placing it in its theoretical and geographical context. In the remainder of this thesis, my own research findings are described and analysed. Chapter two is primarily descriptive, giving an account of the Lundayeh subsistence system. I describe the use and management of forest resources, and the agricultural system. I also give an overview of Lundayeh history in the Ulu Padas, describing the movement of people through the region over the last century.

In chapter three, I focus specifically on Lundayeh diet and food resources. The diversity of resources that are used, and the vegetation types from which these are harvested, are described. I also investigate resource use patterns, and the reasons underlying these. To conclude this chapter, I consider how food preferences reflect particular Lundayeh cultural values, and how dietary patterns are changing.

Chapter four investigates the impact of the Lundayeh on the Ulu Padas through the management and manipulation of their environment and resources. I also address the question of how 'management' can be defined, and consider in what ways the Lundayeh manage their environment. On this basis, I consider whether the Ulu Padas environment can be regarded as a 'wilderness'. Furthermore, I investigate whether forest resources can be regarded as 'wild' from an ecological perspective, and whether the Lundayeh themselves employ such a concept in relation to their food resources.

In chapter five I investigate the different ways in which the Ulu Padas landscape is perceived. I describe how local people's perceptions are shaped by their engagement with the environment, and how these are changing. I also compare local perceptions with those of the various groups of outsiders who have been involved in the region, and consider how Lundayeh views are being influenced by these.

Following on from this, chapter six investigates Lundayeh attitudes towards conservation and development, and how these are changing as a consequence of changes in environmental perceptions. Recent resource management decisions made by the Lundayeh are used to illustrate this. I conclude the chapter with a summary of my findings.

CHAPTER 2: EXPLORING LUNDAYEH HISTORY IN THE ULU PADAS AND PEOPLE'S ENGAGEMENT WITH THE ENVIRONMENT

2: 1. Introduction

In this chapter, I give an account of the way of life in the Lundayeh villages of Long Pasia and Long Mio, describing the ways in which people use, manage and interact with their environment. This provides the basic data and background material that I use in my later arguments, investigating how the Lundayeh have influenced and shaped their environment and resources.

I begin with a description of the two villages, and the way in which settlement patterns have changed over the last one hundred years. I then describe the subsistence strategy, with respect to people's use and management of forest resources and their agricultural system. I also consider how this strategy has changed, and is changing today, as people have responded to new circumstances and opportunities during the last century, and more particularly, in the last ten years.

2: 2. Shifting settlement patterns in the Ulu Padas

The distribution of people is clearly influential in shaping patterns of resource use and in determining people's impact on their environment. Therefore, an understanding of the history of settlement patterns in the Ulu Padas can help in interpreting how the Lundayeh have influenced this landscape. Here, I trace the history of Long Mio and Long Pasia, describing the movements of people throughout the region during the last century and the changes that have occurred in the structure of village life. I also investigate the factors responsible for shaping settlement patterns. Although I focus on the Lundayeh, many of these factors have had widespread impact, influencing other peoples of the interior of Borneo (Rousseau, 1990: 332-339).

I start at the beginning of the twentieth century, as this is as far back as existing oral history relates. At this time, the Lundayeh way of life was different in many respects from what is found today. Perhaps the most significant difference was that the

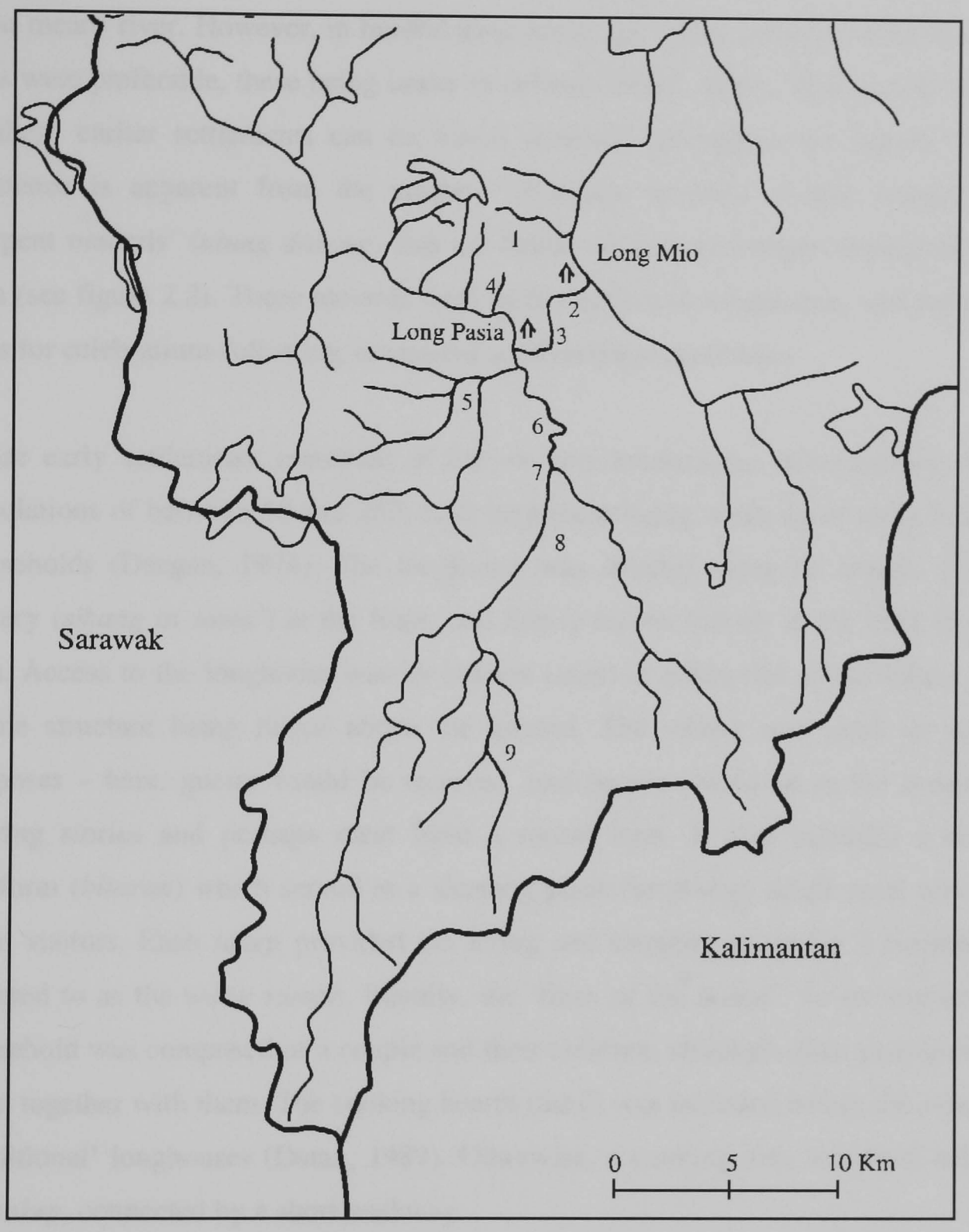
Lundayeh practised headhunting, as they continued to do up until the 1930s, the time at which Christian missionaries reached the area. Ethnographic information about these times is sparse, and so information has to be garnered from second-hand accounts and through analogy with other Borneo peoples at this time, about whom more is known (Banks, 1937; Hose & McDougall, 1966; Pollard, 1933; Roth, 1968; Schneeberger, 1945).

In the early 1900s the Lundayeh of the Ulu Padas lived in small villages scattered along the rivers Matang and Mio. The way of life at this time can best be described as semi-nomadic, with people living and farming in an area for a number of years before moving on. These movements were usually over relatively short distances, within a river basin for example, but there were also long distance migrations (Crain, 1970a: 29; Deegan, 1973: 171; Sellato, 1997: 42-45). Movement was prompted by the need for new land, disputes within the village, or as a result of warfare. Thus, there was a constant shifting of the population, not just for the Lundayeh but for all the peoples of the interior (Eghenter, 1999; Guerreiro & Sellato, 1984; Jessup, 1981). In fact, according to the people of Long Pasia, their village is the site of an earlier Murut settlement. There is supposed to be a Murut burial site here and many of the local place names are of Murut origin. The Murut people were apparently driven down-river by the Lundayeh. Warfare and head-hunting had a significant role in prompting migrations. One old lady of Long Pasia recounted to me how her family fled to Sabah from Kalimantan when she was a girl, because her father had killed someone and was in fear of a revenge attack.

The founders of Long Pasia were people of the Matang river basin. At the time when today's elderly generation were born, some 70 years ago or 80 at the most, there were three longhouses scattered along this river at particular confluences. These settlements were at Abpa Pelanuk, Long Pasia and Abpa Ruren. The elders of Long Mio were born in one of three longhouses, two of which were situated upstream of the current village site on the River Mio, and a third one at Long Pegisi. The location of these settlements is shown in figure 2.1.

From this map, people's preference for making settlements close to rivers is apparent, the rivers being an important means of navigation as well as a source of

Figure 2.1: Past and present village sites and satellite settlements



Key:
1. Long Pegisi
2. Long Mio (old location)
3. Long Pinasat
4. Long Lelayor
5. Abpa Ruren
6. Meganit
7. Long Bayur
8. Long Magut
9. Abpa Pelanuk

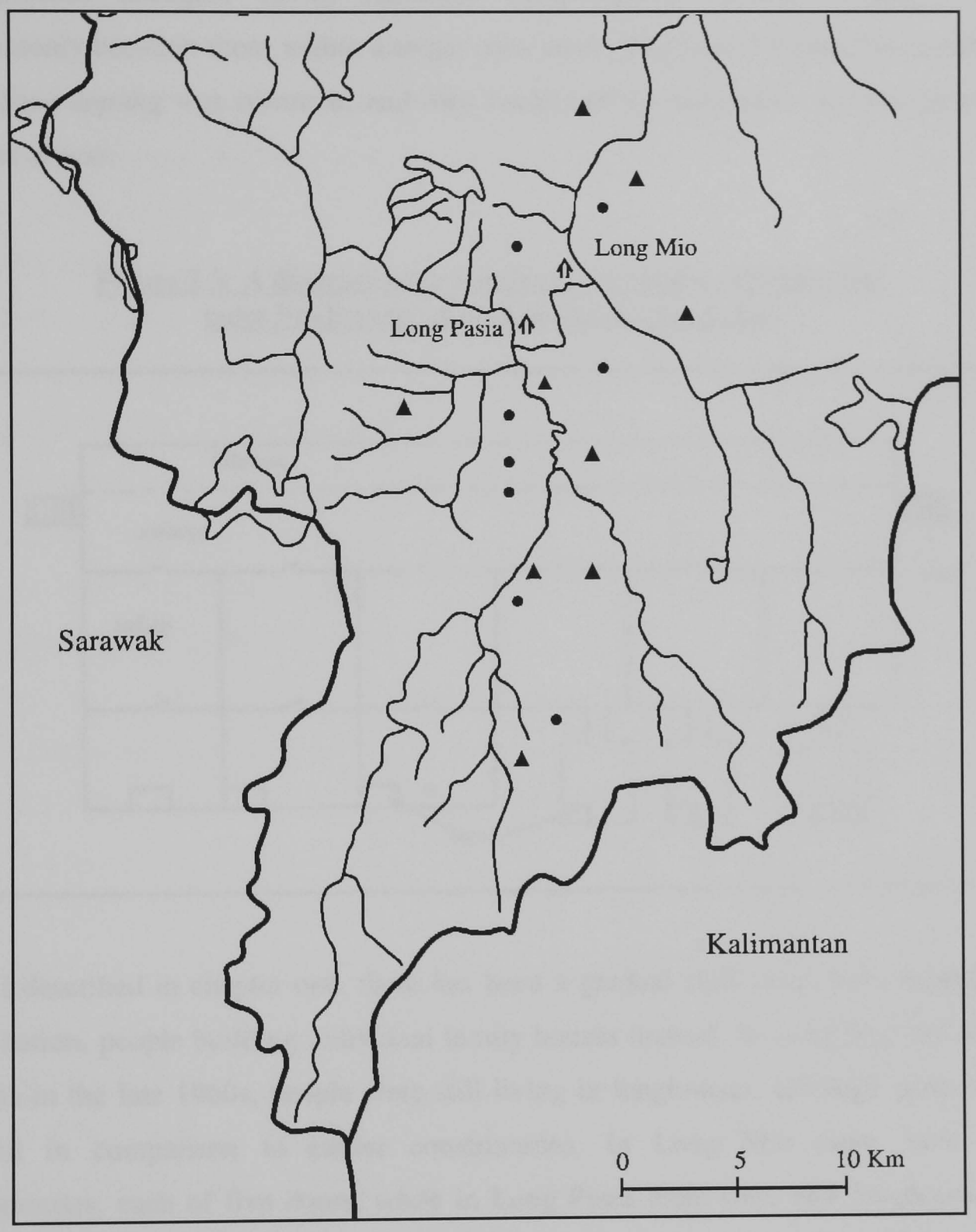
water. Indeed, the names of these villages refer to the rivers on which they were located. The name 'long' is derived from the word for river confluence, *lung*, and *abpa* means river. However, in headhunting times, the threat of raids meant that hill sites were preferable, these being easier to defend (Datan, 1989). Evidence for some of these earlier settlements can be found scattered throughout the region. Their existence is apparent from the earthen 'crocodile mounds' (*ulung buaya*) and 'serpent mounds' (*ulung darong*) that are found on hills and ridges throughout the area (see figure 2.2). These mounds were built adjacent to longhouses, and were the sites for celebrations following successful headhunting expeditions.

These early settlements consisted of one or two longhouses, *ruma kadang*, with populations of between 50 and 250, each longhouse being made up of some 5 to 30 households (Deegan, 1974). The longhouse was divided along its length, with a gallery (*sikang* or *tawa'*) at the front, and family rooms (*takep*) at the back (figure 2.3). Access to the longhouse was by ladders (*ican*) at either end of the *sikang*, the whole structure being raised above the ground. The *sikang* was used for social purposes – here, guests would be received, and people would sit in the evenings, sharing stories and perhaps meat from a recent hunt. It also included a raised platform (*bitaran*) which served as a sleeping place for young, single men, and any male visitors. Each *takep* provided the living and sleeping space for a household, referred to as the *wang rumah*, literally, the 'flesh of the house'. At its simplest, a household was composed of a couple and their children, although often grandparents lived together with them. The cooking hearth (*tatal*) was included within the *takep* in 'traditional' longhouses (Datan, 1989). Otherwise, a cooking area was built behind the *takep*, connected by a short walkway.

Deegan (1974) suggests that the longhouse was the physical manifestation of the Lun Bawang community, at least prior to 1900. Its members were bound together by ties of kinship, with the smaller longhouses being composed of closely related kin and affines (Crain, 1970b). The longhouse also functioned as a social entity in that its members were closely tied in co-operative relationships. These were mainly expressed through sharing agricultural activities. Thus, much of the work in the fields was undertaken communally, working in each household's fields in turn. One benefit of such a system was that by working in groups people were better protected

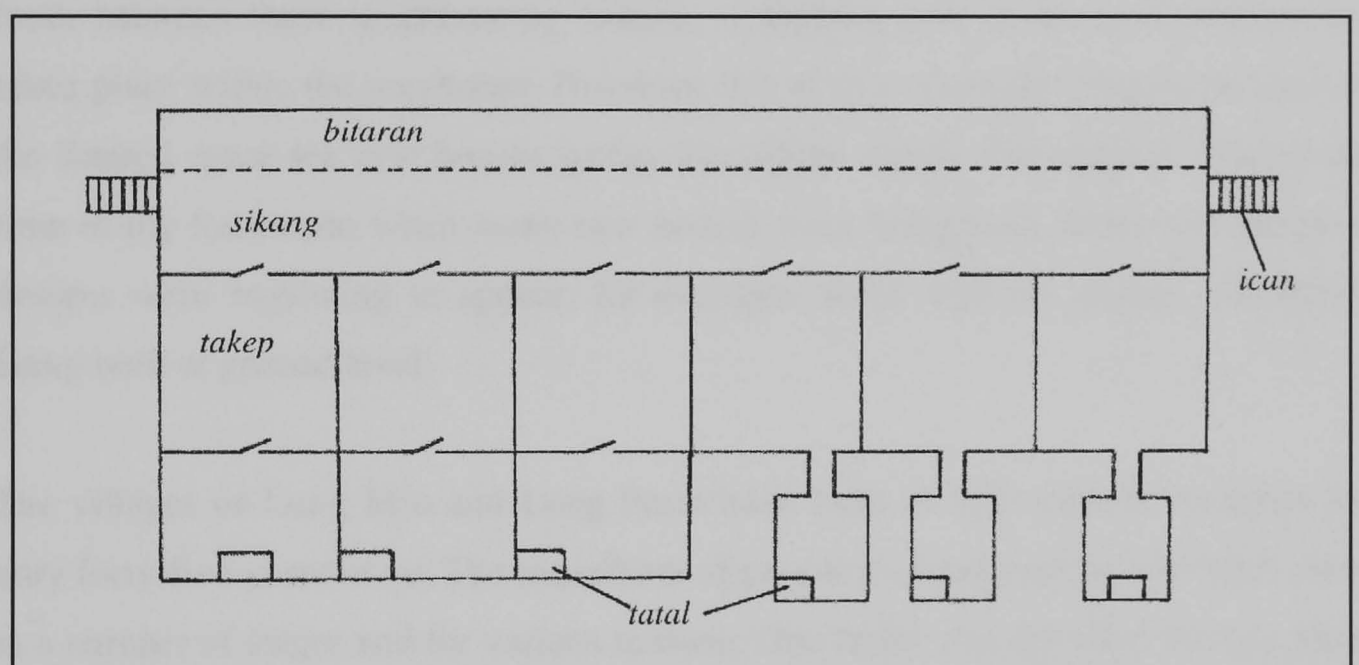
Figure 2.2: Location of *ulung* (crocodile and serpent mounds) and burial sites

(● = *ulung;* ▲= burial site)



against raiding parties. Both the longhouse and its agricultural lands, or territory, were referred to as the *kapung*. Some larger *kapung* included two or more longhouses (Deegan, 1974). Alliances were formed between *kapung*, most commonly between those within a single river basin. Marriage between the members of allied *kapung* was common, and they could call on each other for assistance in times of war.

Figure 2.3: A diagrammatic Lundayeh longhouse, showing the more 'traditional' design on the left hand side



As I described in chapter one, there has been a gradual shift away from longhouse habitation, people building individual family houses instead. In Long Mio and Long Pasia in the late 1960s, people were still living in longhouses, although these were small in comparison to earlier constructions. In Long Mio there were two longhouses, each of five doors, while in Long Pasia there were two longhouses of five doors, one of four doors and one of three doors (Crain, 1970c). These were among the last longhouses to be built here, as it was around this time that people began to build individual houses.

In Long Mio and Long Pasia today, everyone lives in separate houses with the exception of two families who live in a two-door longhouse. However, certain aspects of the longhouse can still be seen in the design of these individual houses. Thus, there is a *dapur* at the rear, usually connected to the main body of the house by

a walkway. The main part of the house includes a large room, with perhaps one or two bedrooms off this. In the front of the house is a veranda, equivalent to the *sikang*, where guests are received in the daytime, and where many hours are spent socialising and watching the world go by, when there is no work to be done. In one other aspect there are parallels between the longhouse system and today's living arrangements. This is in the geographical arrangement of houses, in which close relatives prefer to build houses next door to each other. Thus, in Long Pasia, where there are a number of different family groupings, you find that the houses of close relatives are often clustered together. In every day life, there is a continual movement of people, and food, between these neighbouring houses, something that in the past would have taken place within the longhouse. However, this is now changing, largely because of the limited space for new houses within the village centre. Furthermore, during the time of my fieldwork, when many new houses were being built, houses of different designs were beginning to appear, for example, some with no *sikang*, and others being built at ground level.

The villages of Long Mio and Long Pasia have been in their current locations for only forty-five years or so. The movement of people to these current sites took place in a number of stages and for various reasons. One factor was the need for new land. This, I was told, was the reason why the longhouse at Abpa Pelanuk shifted downriver, first to Long Magut and then to Long Bayur. Another reason for movement was the fact that villages were, and still are, in a constant process of fission and change. Villages would split because of an increase in population, and so land would become in short supply, or as a result of disputes between people. For example, the settlement of Long Pasia used to be located at Long Lelayor, but the first people to move down-river to the current village's location were prompted to do so because of a dispute over access to water for the wet rice fields. The Christian church also played a role, and this was one of the reasons why Long Pasia became the 'main' village for those people living on the River Matang. It was in Long Pasia that the first church was built, and so families would travel here every Sunday to attend church. The difficulties of making this journey every week led several families to move to Long Pasia.

Another important factor in influencing the movement of people was Government policy. In the early 1950s the government encouraged people to move from the interior down to the towns, for easier administration. Everyone from the Ulu Padas moved down to Sipitang (with the exception of one family who moved to Sarawak), abandoning the villages of Long Mio, Long Bayur, Abpa Ruren and Long Pasia. However, after a few years, several families moved back, because, they explained to me, there were few animals for hunting in the lowlands, and not enough agricultural land. Long Mio and Long Pasia were re-founded in their current locations by one and three families respectively. Others gradually followed, as they became disillusioned with life in the lowlands. The other settlements were not returned to on a permanent basis, although people still farmed the land there. In later years, an additional settlement was started at Long Pinasat. This was founded by a group of families who moved to Sabah in 1962 from Kalimantan (Crain, 1970a: 34). However, in the late 1970s this settlement was abandoned, apparently because of the difficulties of travelling every week to church, and the need to send their children to the primary school in Long Pasia.

As I mentioned in chapter one, there has been a steady movement of people from Kalimantan into Sabah during the twentieth century. This movement became more marked after the late 1940s, the time of Indonesia's independence. The reason for this was that following independence there was a breakdown of communications and commerce in the interior of East Kalimantan. Consequently, the Lundayeh, as well as many other peoples, moved to Malaysia in search of better economic opportunities. Some of the Lundayeh settlements along the Mengalong River, near Sipitang, date from the late 1940s. There are also small numbers of Lundayeh living near Tenom who moved here in the 1950s. Smaller movements of people followed the period of the Indonesian-Malaysian confrontation (1963-1966) (Crain, 1973; 1978). While many of these people moved through the Ulu Padas on route to the lowlands, some families settled in Long Pasia, such as those who lived at Long Pinasat.

We come, finally, to the situation today. Long Pasia is now a village of about 400 residents, living in 68 households, and Long Mio has 120 residents, living in 15 households. In the case of Long Pasia, there are also satellite villages. These are at some of the old village sites where people still farm the land, namely, Long Bayur,

Meganit, Abpa Ruren and Long Pinasat. At certain times of year when there is much work to be done in the fields, for example, during planting and harvesting seasons, families move out to their fieldhouses, only returning to Long Pasia every one or two weeks to attend church and to stock up on supplies.

With the establishment of a school, medical clinic, and the road, the attraction of moving again is small. This has been further discouraged by the expansion of wet rice cultivation, and the granting of registered land title. However, moving is still seen as an option. For example, one group of families has established coffee fields upriver at Abpa Pelanuk on what they claim as their ancestral land (although this is disputed). These families now spend much of the year living there, and talk about moving there permanently, something that was prompted by a dispute with other villagers. Other families talk about the possibility of re-establishing villages at Long Pinasat and Long Bayur if roads are cut through to these sites in the future. These feelings have arisen because of a shortage of land near to the village, and also because of a desire to live once more in a small, close-knit group. In recent years the populations of Long Pasia in particular, and to a lesser extent, Long Mio, have grown. This is largely due to couples returning on their retirement, tempted by the relatively easy access to the area with the arrival of the road. Indeed, it is the expressed desire of most young couples who move away to return to their village in future years.

Today, then, we see a different pattern of migration, mainly between the towns and the village. The younger generation go to towns, throughout Malaysia and more widely, to seek work. However, many return, some disillusioned with urban life, and others with sufficient savings or after retirement. Some people have also moved here from Kalimantan, thus continuing the historic movement of people from the south. However, the underlying reasons for this have changed. Rather than warfare, the search for economic opportunities is now the most important factor.

2: 2: 1. The mythical communities of Long Pasia and Long Mio

Throughout the previous discussion I have been referring to Long Pasia and Long Mio as either villages or settlements. I have studiously avoided the term 'community'

for the reason that although villages are often equated with communities, this cannot be assumed (Kemp, 1988). This is worth highlighting because often implicit in the idea of a community is that its members hold uniform views and beliefs. Indeed, throughout this thesis I discuss 'Lundayeh perceptions'. Although I talk in these general terms, I do not wish to suggest that the inhabitants of Long Mio and Long Pasia hold the same views. Such assumptions have particular implications for conservation issues (which I consider in chapter six), as has been highlighted by Agrawal & Gibson (1999). In their analysis of so-called 'community-based' natural resource management projects, they refer to the concept of community as 'mythic'. I would suggest that describing Long Pasia and Long Mio as communities is, in certain respects, also a myth.

A community is usually defined in one of two ways – either geographically, i.e. as a discrete, spatial unit, or in terms of the relations between people, i.e. as a group of people with shared norms and a homogeneous social structure (Agrawal & Gibson, 1999). Often, these two definitions are assumed to coincide, and in some situations, they may do so. This was perhaps the case for the Lundayeh in the early 1900s and the previous century, when settlements were smaller and more closely knit. As I described above, at this time, the members of a longhouse were typically closely related kin, and were bound together in cooperative relationships (Deegan, 1974). Such a longhouse can perhaps be regarded as a community, in both senses of the word. Today though, the situation is very different. The communities of Long Pasia and Long Mio, as defined in terms of geographical boundaries, do not coincide with the communities that exist with respect to social relations. For example, one family that lives on the outskirts of Long Mio regards itself as a part of Long Pasia. This is the village with which they wish to be associated, and this is where the family attends church (even though this entails a forty minute walk, rather than the five minute walk to the Long Mio church).

This example highlights the role that the church has had, not just in shaping settlement patterns, as I described above, but also in defining social boundaries. Within Long Pasia, a large village with people of various geographical origins, the church has had an important role in uniting people. It is usually through the church that communal activities are organised, whether agricultural activities, village

projects (such as weeding the village grounds or maintaining the football pitch), or social events (visits to other villages and holding feasts).

However, although the church has acted as a uniting force, this is only true to a certain extent. In many respects, Long Pasia is best viewed as a conglomeration of several family groupings, cast together by circumstances. Hidden beneath the seeming unity of the village there exists an enduring legacy of inter-family enmities and alliances (Vaz & Hoare, in prep.). As well as these various family alliances, divisions exist within the village on the basis of length of residence. Those families that have moved to Long Pasia in the last twenty years are still regarded as outsiders by the 'original' inhabitants. This is in spite of the fact that they have built homes, farmed the land and raised children here. This is also an issue in Long Mio where a couple of families have recently returned to the village having spent over ten years working in the lowlands. Their right to a voice in village affairs has been the subject of some debate.

There is little evidence that either Long Mio or Long Pasia fit with a vision of a closely integrated community, in which everyone holds a shared set of beliefs and values. Diverse opinions and views are to be found within both these villages, something that has at times been the cause of conflict. On the other hand, I do not wish to present a picture of these two villages as being completely divided. In certain respects, they do function as communities. This becomes particularly apparent at times of marriage, and even more so, following a death, when the villages are united in providing help and support. In highlighting some of the problems with the concept of 'community' I am simply emphasising the differences that exist within Long Mio and Long Pasia – differences in background, beliefs, perception, decisions, and so on. These need to be borne in mind as I discuss these various aspects in the course of my thesis.

2: 3. Hunting, fishing and gathering

In this account of Lundayeh subsistence strategies, I begin by describing the use and management of forest resources, and follow this with an account of the agricultural system. I have chosen to order it in this way to emphasise the significance of forest

resources for the Lundayeh way of life. Nearly all accounts of agricultural communities start with a description of the farming system, and people's use of forest resources is somehow relegated to second place. Thus, it is implied (not necessarily intentionally) that forest resources are merely a back-up, or optional extra, to agricultural resources. This is to undervalue their importance, at least for the Lundayeh. The use and management of forest resources play a central role in their subsistence strategy, these providing nearly all the meat, a large proportion of the vegetables, and innumerable other resources. Furthermore, these activities form a part of Lundayeh identity, as I describe later. As local people themselves remarked, 'what are the Lundayeh if there is no forest?'

Forest extraction and farming are complementary and closely integrated, and it is often false to make a rigid separation between the two. Farming can merge into hunting, for example, people take advantage of the time they are in the fields to set traps, or they may carry their gun with them when farming in the hope of encountering game (Balée, 1994: 58; Bulmer, 1967; Dove & Kammen, 1997; Linares, 1976). Furthermore, many non-cultivated foods come from habitats created as a result of agricultural activities, such as fallow fields (Kunstadter, 1978). It is the practice of shifting agriculture, conducted over many decades, that has created the mosaic of forest at different stages of regeneration that is found throughout Borneo today (Colfer et al., 1997: 79; Peluso & Padoch, 1996: 121). Thus, farming activities may increase the diversity of non-cultivated food resources that are available. In the light of this, agriculture might better be viewed as part of the system of forest management, as I discuss in chapter four.

Both in the past, and today, the forest provides a wide range of products. The forest (and its rivers) is the source of game and fish, construction materials, firewood, insects, weaving materials, vegetables, fruits, medicines, and in recent years, a resource for tourists. For the Lundayeh people, the most highly valued of these resources is game, and so I will begin by describing hunting activities.

2: 3: 1. 'Going into the forest' – hunting

There is no generic word in the Lundayeh language for hunting. When people are going on a hunting trip, they say that they are 'going into the forest' (*ame bang fulung*). This is the nearest gloss to the word 'hunting', since whenever someone says they are going into the forest, it is implicit that they intend to catch some game. However, the trapping of animals is outside the definition of hunting for the Lundayeh, as it is for many other societies and indeed, researchers (Bennett & Robinson, 2000: 2; Bulmer, 1967; Ellen, 1996: 600-602; Ingold, 1986: 103). In spite of this, I have included trapping in the following discussion, since these activities clearly fit best here.

Hunting is central to the Lundayeh way of life. Game provides nearly all the meat that is eaten, but the importance of hunting is greater than this. To go hunting is seen as part of what being Lundayeh is all about, at least for a man. It is only the men who go hunting, although a few women told me that they had, on occasion, accompanied their husbands on hunting trips. To be a skilled hunter is held in high esteem, and so a good husband is a man who will provide his wife and family with a ready supply of meat. Other factors are increasingly at play in this respect, in particular, the ability to earn a good cash income. However, providing your wife with the cash with which to buy meat is still not considered quite as good as having hunted it yourself.

In both villages, hunting trips take place nearly every day. The data on hunting success rates show that on average two hunting trips per household were made each week (2.2 trips in Long Pasia, and 1.8 in Long Mio) (see appendix 1). Hunting trips range from a few hours walk from the village, to several days travelling upriver by boat and on foot. They may involve individuals, small groups of friends, or almost the entire male population of each of the villages. Hunting trips are organised for various reasons, and with varying degrees of planning. Some hunting is purely opportunistic, involving a chance encounter on the way to or from the fields for example. However, most hunting trips are planned. An individual may decide to go out hunting because there is no meat in the house, or simply because he has nothing else to do. He may also go hunting to get away from village life, or for some solitude. For the young men in particular, a trip into the forest provides an opportunity to escape from the restrictions of village life. It also provides a means of

earning some cash, as I discuss later. Larger group hunts tend to be organised if there is a communal meal, or a group of visitors, for whom it is considered essential to serve meat. Another type of hunt that has been taking place increasingly in recent years are hunts organised by outsiders. People from the lowlands, in particular from Sipitang, come up to the area to do some hunting or fishing, either wanting a break from urban life or the chance to eat some game.

2: 3: 1: 1. Wild boar and other animals

For the villagers, *baka*, wild boar (or bearded pig, *Sus barbatus*) (plate 2.1) is the favourite game animal, as it is for most highland Borneo people (Caldecott, 1988: 30; Chin, 1985: 87; Dove, 1993; Wadley et al., 1997). Boar is preferred because it is regarded as the most delicious meat. However, this is not the only reason. Wild boar is an important part of Lundayeh identity. This is particularly so living as they do in

Plate 2.1: Two boar heads

an Islamic country, since there is a feeling that they need to defend their Christian identity. Wild boar can also be massive animals, and so a single animal provides a large amount of meat. A large male weighs about 80kg, or exceptionally, as much as 120kg (Payne et al., 1994: 296), of which about half the body weight is meat. As

well as meat, the boar provides cooking oil. In the past, the rendered fat was the sole source of cooking oil. Today, although boar fat is preferred, there is not enough to meet requirements, and so increasingly people buy cooking oil in town.

For all these reasons, people prize the wild boar above all other animals, and will go out hunting specifically for it. If there is a chance of catching a boar, other animals will not be hunted even if they are encountered. After boar, deer are the next favoured, both the *payau*, sambar deer or rusa (*Cervus unicolor*), because it is so large, and also the *talau*, barking deer (*Muntiacus muntjac*). *Pelanuk*, mousedeer (*Tragulus napu*) are also popular, having a very distinctive flavour. Most other animals tend to be shot only if there are no boar or deer around. The exceptions to this are the *beruang*, sunbear (*Helarctos malayanus*) and *payu*, bearcat (*Arctictis binturong*), both of which are valued for their gall bladders. These are used as a medicine within the village and also sold to Chinese medicinal practitioners. In the past, two other animals were much sought after – the *temacur*, rhinoceros (*Dicerorhinus sumatrensis*), whose horn was also highly valued in the Chinese medicine trade, and the *kalio*, tembadau or wild cattle (*Bos javanicus*), hunted for its meat. The rhinoceros is now extinct in the area, and the tembadau extremely rare.

In table 2.1, I have listed all animal species that I saw hunted (or eaten), or was told that are still hunted today, or that were hunted in the past. I have also listed in table 2.2, those bird species identified as being regularly hunted or trapped. This shows the diversity of animals that are hunted. There are no taboos on killing particular species, nor apparently were there any in the past. The *suduh*, Malay badger (*Mydaus javanensis*) is the only animal that I was told was not killed, and this was simply because it has a bad smell. It is in fact illegal to kill those species listed as protected under Sabah's Fauna Conservation Ordinance (1963). This legislation, although known about, is ignored by the villagers. This is apparent from the data in the table, in which I have indicated those animal species that are hunted and are also protected.

People's preference for certain game animals are apparent from the data on hunting returns. Tables 2.3 and 2.4 show the numbers of animals that were hunted during the seven-day periods in which I conducted dietary surveys in both villages. Wild boar and deer are the animals most frequently killed. Not surprisingly, there is

Table 2.1: Animal species hunted by the Lundayeh

LUN DAYEH NAME	ENGLISH COMMON NAME	SCIENTIFIC NAME	Seen hunted	Told is hunted	Used to be hunted, but no longer	Protected species
Falang alud	Banded linsang	*Prionodon linsang*	*			*
Talau	Barking deer	*Muntiacus muntjac*	*			
Kekelit	Bats (small species)	Various species		*		
Payu	Bearcat / binturong	*Arctictis binturong*	*			*
Bakaa	Boar	*Sus barbatus*	*			
Kelabet	Borneon gibbon	*Hylobates muelleri*	*			*
Kuir	Clouded leopard	*Neofelis nebulosa*		*		*
Seruang	Cobra	*Ophiophagus* sp.	*			
Kubeng	Flying lemur	*Cynocephalus variegatus*	*			*
Tamai	Frog	Unknown species	*			
Pawat	Fruit bat	Various species		*		
Berangad	Hose's langur / Grey leaf monkey	*Presbytis hosei*	*			*
Tubang	Leopard cat	*Felis bengalensis*	*			*
Kuyad	Long-tailed macaque	*Macaca fascicularis*	*			*
Kuir	Malay civet	*Viverra tangalunga*		*		
Kelasih	Maroon langur / Red leaf monkey	*Presbytis rubicunda*		*		*
Ribuan	Masked palm civet	*Paguma larvata*	*			
Kabuk / Kadarat	Monitor lizard	*Varanus salvator*	*			
Labo	Mouse	Various species			*	
Pur	Mouse	Various species			*	
Pelanuk	Mouse deer	*Tragulus napu*	*			
Dangen	Otter	*Lutra sumatrana / Aonyx cinerea*?		*		*
Arem	Pangolin	*Manis javanica*	*			*
Becuk	Pig-tailed macaque	*Macaca nemestrina*	*			*
Terutung	Porcupine – common	*Hystrix brachyura*	*			
Terutung badak	Porcupine – thick-spined	*Thecurus crassispinis*	*			
Menelen	Python	*Python* sp.	*			
Payau	Sambar deer	*Cervus unicolor*	*			
Fugeh	Slow loris &/or Western tarsier?	*Nycticebus coucang / Tarsius bancanus*	*			*
Badan	Small-toothed palm civet	*Arctogalidia trivirgata*	*			

Labo afing / labo fulung / sigaa	Squirrels	*Tupaia* spp.	*			
Temacur	Sumatran rhinoceros	*Dicerorhinus sumatrensis*			*	*
Beruang	Sun bear	*Helarctos malayanus*	*			
Kalio	Tembadau / banteng	*Bos javanicus*			*	*
Beladan / ebu	Turtle	Unknown species		*		
Kebarun	Water monitor lizard	*Varanus* sp.		*		
Bungaley	Yellow-throated marten &/or Hose's civet?	*Martes flavigula / Hemigalus hosei*		*		*

Table 2.2: Regularly hunted or trapped bird species

LUNDAYEH NAME	ENGLISH NAME	SCIENTIFIC NAME	Protected species
Serukan	Partridge	Unknown species	Some species
Tapiak	Bulwer's Pheasant	*Lophura bulweri*	*
Tuau	Great Argus Pheasant	*Argusianus argus*	*
Balud	Green Imperial Pigeon	*Ducula aenea*	*
Metor	Green Pigeon	*Treron* sp.	
Bau ulun / suit rayeh	Malaysian Peacock Pheasant &/or Crested Fireback?	*Polyplectron malacense* or *Lophura ignita*	*
Gagor	Partridge – Red-breasted?	*Arborophila hyperythra*	*
Sukur	Spotted dove	*Streptopelia chinensis*	*
Keruak	White breasted waterhen	*Amaurornis phoenicurus*	*

considerable variation in the numbers recorded. This is because of variations in people's hunting activities, and in their success. Men's involvement in hunting varies, depending on: their other responsibilities, such as agricultural work and wage

Table 2.3: Hunting returns for Long Mio

LONG MIO	18th – 24th Nov. 1999	7th – 13th Feb. 2000	7th Mar. – 2nd Apr. 2000	31st July – 6th Aug. 2000	11th – 17th Sept. 2000
Wild boar	1	1	-	-	-
Sambar deer	1	-	4	-	-
Barking deer	3	1	2	1	-
Mousedeer	-	2	6	3	5
Langur	2	1	1	1	-
Grey leaf monkey	-	1	1	-	-
Porcupine	-	4	1	-	1
Civet cat	-	-	-	-	2
Python	-	-	-	1	-
Hornbill	1	-	-	-	-
Spotted Necked Wild Dove	-	-	-	2	-

Table 2.4: Hunting returns for Long Pasia

LONG PASIA	29th Nov. – 6th Dec. 1999	24th – 30th Jan. 2000	10th – 16th Apr. 2000	26th June – 2nd July 2000	2nd – 8th Oct. 2000
Wild boar	7	12	9	9	3
Sambar deer	8	7	1	1	1
Barking deer	9	16	11	1	6
Mousedeer	5	8	1	3	1
Langur	3	-	3	-	1
Grey leaf monkey	-	2	-	-	-
Porcupine	4	3	-	1	-
Civet cat	-	1	-	1	-
Pangolin	-	1	-	-	1
Small-toothed palm civet	-	-	-	1	-
Python	-	-	1	-	-
Monitor lizard	1	-	-	-	-
Frog	2	1	-	-	-
Turtle	-	-	-	1	-
Spotted Necked Wild Dove	1	-	-	2	-
Suit fulung (type of partridge)	4	-	-	-	-
Crested fireback	-	-	-	1	-
Bulwer's pheasant	-	-	-	1	-
Green pigeon	-	-	-	1	-

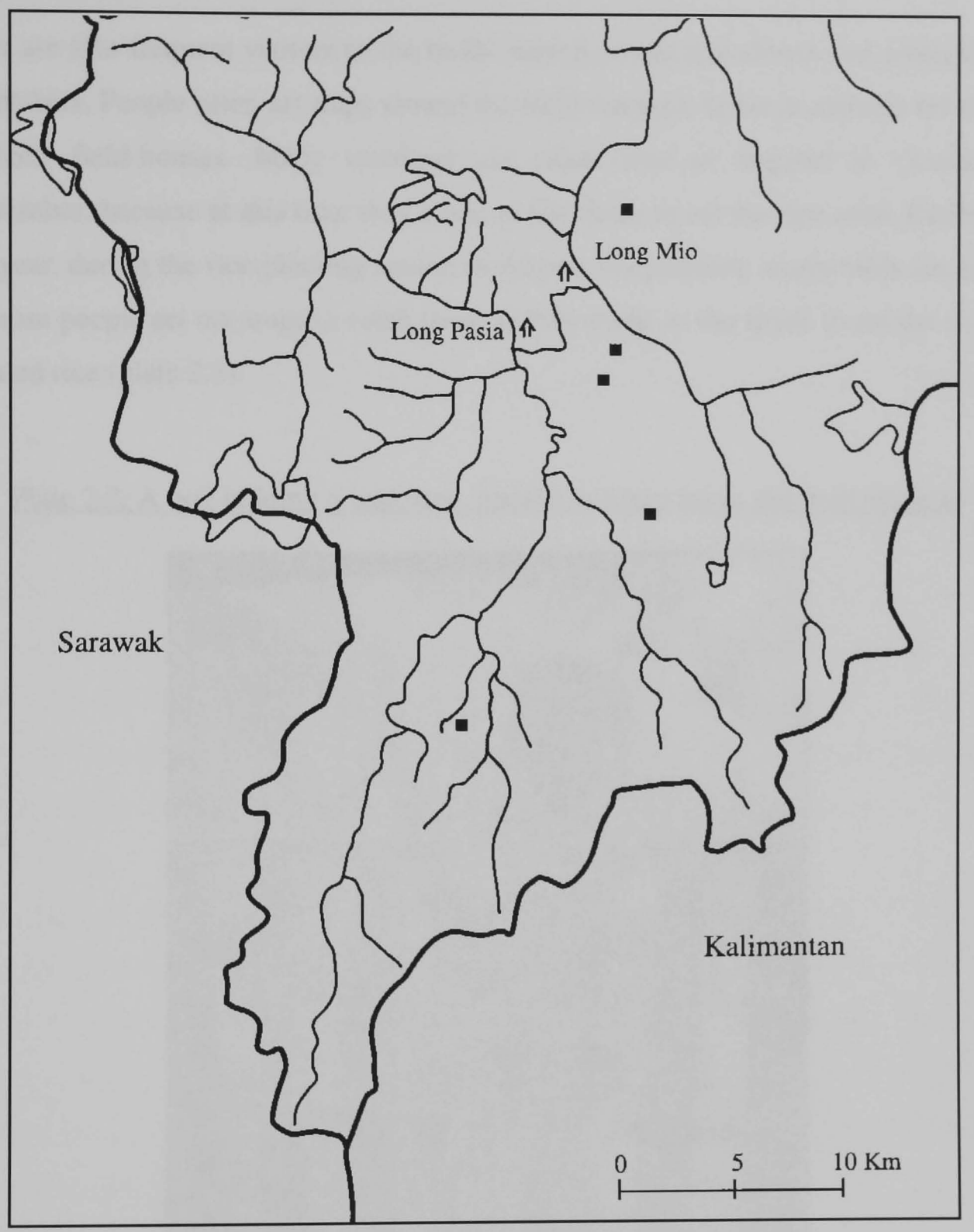
labour opportunities; the need for meat; and whether there are any animals around. For example, on several occasions people told me that there was no point in going hunting because there were so few animals around at the time.

Hunting success, while obviously related to an individual's skill, also depends on the distribution and populations of animals in the area. This is influenced by the weather, local availability of food, and increasingly, by disturbance from logging activities. During periods of dry weather, many animals visit salt licks (*rofen*), because at such times the minerals are more concentrated. The occurrence of salt licks has been found to influence the distribution of many animals, in particular, sambar deer (Caldecott, 1988: 81). There are numerous salt licks in the vicinity of the villages (see figure 2.4), and during dry periods hunters go to lie in wait at these sites. Conversely, wet weather adversely affects hunting activities, because of its influence both on human and animal behaviour. In very wet weather, few people like to go out in the forest. Furthermore, in heavy rain it is both harder for the dogs to find a scent, and the animals do not move around so much, making it more difficult to find them.

Another important factor influencing animal distribution is the fruiting season of forest trees, and also the availability of food in the fields. Fruits of the dipterocarps (Dipterocarpaceae) and the oaks and chestnuts (Fagaceae) are an important part of the wild boar's diet (Caldecott, 1988: 60). Local people are well aware of this, telling me that boar like to eat the fruits known as *saled* (various species of *Lithocarpus*), and *buthu, berangan* and *fidaawee* (all species of *Castanopsis*) in particular. The fruiting activity of these trees is variable, sometimes with many species being involved in a mast fruiting event. The wild boar migrate, following the availability of these fruits. Large-scale movements of boar have been documented from throughout the interior of Borneo (Caldecott, 1988; Dove, 1993), although none were known from the Ulu Padas in recent history. On a much more local scale, individual animals frequent trees that are in fruit, and so hunters take care to note which trees are in fruit or are about to start fruiting. Not just wild boar, but also deer, monkeys, and birds are attracted by some fruiting trees, and so can be caught by lying in wait at these locations (Caldecott, 1988). Apparently, figs (*bua lunuk*, *Ficus* spp.) are a favourite food of barking deer, as well as of many birds. Monkeys are major consumers of the

Figure 2.4: Location of salt licks

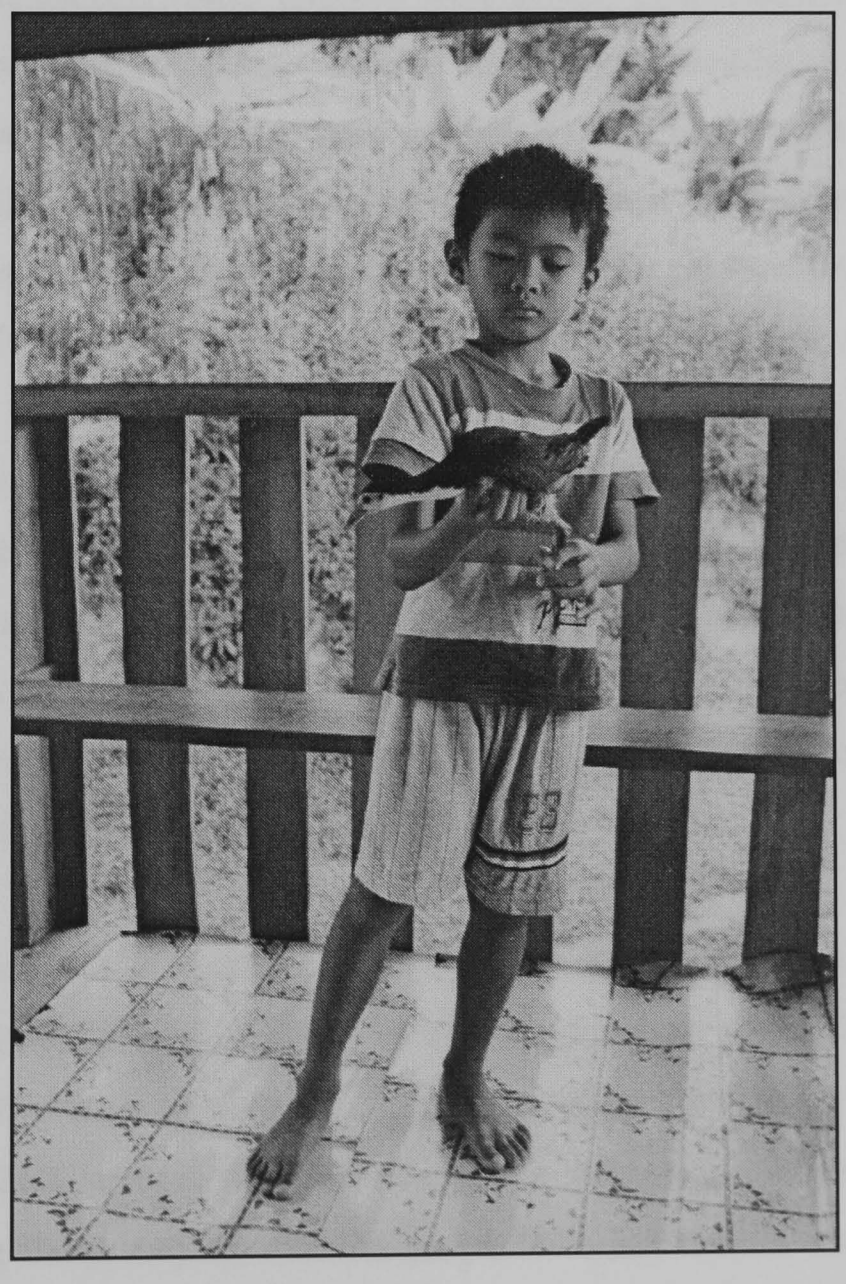
(■ = salt lick)



same fruits that humans like to eat, such as mangos (*Mangifera* spp.), durian (*Durio* spp.) and rambutan (*Nephelium* spp.), to name just a few.

Deer are also frequent visitors to the fields, eating young rice shoots and green leafy vegetables. People often set traps around the field margins, or lie in ambush for them in their field-houses. Many monkeys are either shot or trapped in October - November, because at this time they come to the fields to eat the ripe corn. Earlier in the year, during the rice-planting season in August - September, many birds are eaten because people set out traps to catch them as they come to the fields to eat the newly planted rice (plate 2.2).

Plate 2.2: A boy holding a waterhen, caught in a trap set in the field margins



Some of these factors were responsible for the variation seen in the hunting data for Long Pasia. The most animals were hunted in the first two weeks of surveys. One

reason for this is that at these times the men of the village had few agricultural responsibilities, and therefore, had the time to go hunting. November and December is the time when the rice fields are weeded, a task undertaken mainly by the women. In January, when the second survey was conducted, only a few families had begun to harvest their rice. Another reason why more animals were hunted during these two surveys is that they coincided with the fruiting season of many forest species. In particular, many of the fruits that the boar like to eat were ripe, although apparently there were not many fruit in comparison to previous years, suggesting it was not a mast fruiting year. Awareness of the relative abundance of fruit meant that people were more interested in going hunting because of the greater chance of encountering boar.

During the April survey, fewer animals were killed. One reason for this was that there was a wedding in the village, and so there was no need to go hunting because everyone was eating pork during these celebrations. In the last two surveys, there was relatively little hunting going on because the men were involved with other work. In June and July, the men were clearing the fields for new swiddens, while in October, a lot of the younger men had gone to work in the logging camps.

Such patterns are harder to distinguish from the Long Mio data, because of the small numbers involved. In this village, fewer animals are hunted compared with Long Pasia, even accounting for the smaller population. This is partly because there are only a few men from Long Mio who are interested in hunting. People here often complained to me that animals, and boar in particular, are much harder to find near Long Mio than they are around Long Pasia.

The data collected on the hunting success of ten households provides some support for this (appendix 1). In Long Pasia, 17 out of 31 trips were successful, equivalent to a success rate of 55%, while in Long Mio, just 2 trips out of the 9 were successful, equivalent to a 22% success rate. Another factor contributing to the greater hunting success in Long Pasia may be that the people here are more willing to go further afield to find animals. In Long Mio, it is very rare for any of the men to go on long hunting trips, say of two days or more, whereas in Long Pasia, this is common.

During the periods of observation just cited, the average length of a hunting trip was 1.2 days in Long Pasia, and 0.7 days in Long Mio.

People from both villages often told me that game has become harder to find, particularly in the last ten years. This would not be surprising, given the logging activities and the increasing number of people in the region. One probable consequence of this is that a wider range of species is being hunted, a pattern of behaviour often observed when animal populations decline (Wadley et al., 1997). There is some anecdotal evidence for this. Thus, on a number of occasions people told me that they had shot an animal because they did not find any boar or deer and did not want to return home empty handed.

2: 3: 1: 2. <u>How to catch your boar</u>

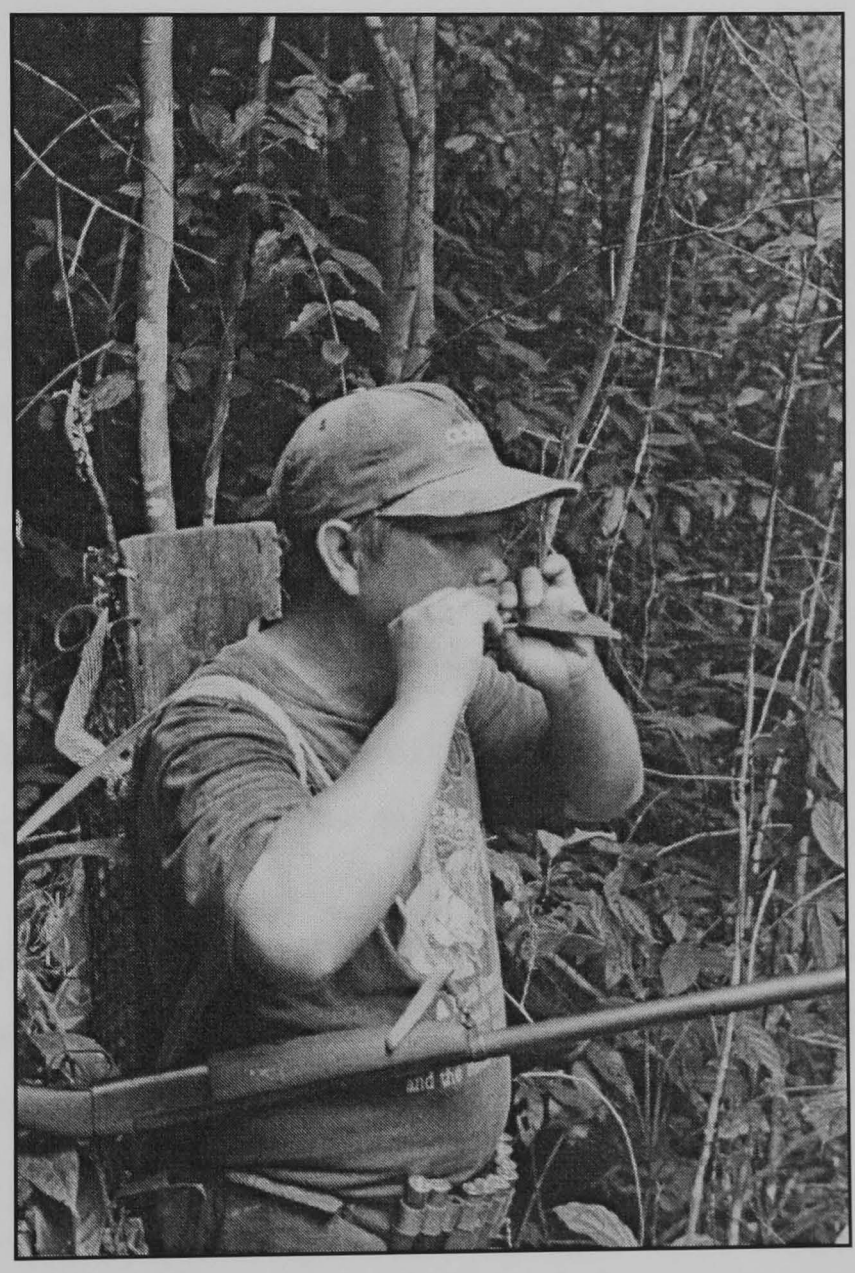
There are a number of techniques employed in hunting. *Nganup* involves the use of dogs. In such cases, usually one person, or occasionally two, will go out with his dogs, of which he may take from one to as many as ten. Hunting dogs are a prized possession, and if a dog is a strong hunter, is of great value – as much as 1000RM (a price equivalent to that of a buffalo).

An alternative method is that of *ngilip*. This involves tracking and stalking the animal. A method often used to catch deer, usually the barking deer, is one of mimicking their cries. By sucking through a folded leaf a high pitched squeaking is emitted, a sound which is said to resemble the cries of a young barking deer (plate 2.3). On hearing this, any nearby adult deer will come to investigate. Apparently though, this no longer works well near the village, because the deer have become accustomed to it.

Ngelibut involves a group of people, and is carried out in secondary forest where many deer are to be found. The deer favour the dense undergrowth of these habitats, which provides them with good camouflage. This vegetation is also a rich source of young shoots, an important food of both the sambar and barking deer (Caldecott, 1988: 81-82). A group of people will encircle an area, and flush out any animals. This is usually done for a village feast, because it involves a communal effort.

Ngilu is to go hunting at night, with the use of a flashlight. The animals are spotted by their eye-reflections, and often the animal freezes, enabling it to be shot. Usually only one person goes hunting in this way because if there is more than one flashlight in use, the animals are more easily frightened off. However, this method is increasingly being used by people with cars who drive along the roads with powerful lamps, searching for animals in the nearby vegetation.

Plate 2.3: Calling a deer while out hunting (*ngilip*)



More traditional methods of hunting at night are to lie in ambush, *ngabang*. As I mentioned above, good spots for this are salt licks and also trees that are in fruit. A small shelter or platform, *barat*, will usually be built for the hunter to sit and wait in.

2: 3: 1: 3. Guns, spears, blowpipes and snares

In his analysis of Ankave-Anga hunting in Papua New Guinea, Lemonnier (1993: 680) suggested that the techniques people use are 'the result of choices made by a culture', and consequently, that they are value-laden. Thus, a particular hunting technique may form part of the cultural value of a food, or it may function as an ethnic marker. For the Lundayeh, the techniques used in hunting do have certain values associated with them, although these are more subtle than amongst the Ankave-Anga. Thus, hunting with dogs is something associated with being Lundayeh, in contrast to people of the towns, and in particular, to Malay (Muslim) people.

The choice of weapon is also meaningful. The most commonly used weapon is the shotgun, this being chosen because it is the weapon with which you are most likely to kill an animal (Wadley et al, 1997). Not everyone owns a gun. Those who don't either borrow one, usually from close relatives or friends, or they invite someone with a gun to join them when they go hunting. Ammunition is quite hard to come by, because it is only legally available to those who have a shotgun licence, which only a few shotgun owners have. In addition, the amount of ammunition that a licence owner can buy is limited. This means that for non-licence owners, buying ammunition on the black market is expensive, bullets costing 3RM in Sipitang, or as much as 5RM in Long Pasia or Long Mio. For this reason, the villagers are often happy to accompany soldiers from the nearby army camp on hunting trips.

The spear (*busu*) is the preferred weapon of some people, and still widely used. Not only is it regarded as a traditional weapon of the Lundayeh, it is said to involve more skill than the use of a shotgun. It also has the advantage that no ammunition is needed.

A weapon that is rarely used nowadays is the blowgun (*aput*). When using blowpipes, poisoned darts are used. The younger generation are not knowledgeable in preparing these, just as they are less skilled in using the blowgun itself. A few of the elderly men do still use blowguns, and some of the school children spend their spare time shooting birds and squirrels and other small animals. However, many blowpipes now simply gather dust on people's walls. This is largely because of lack

of interest. Today, if people go out hunting, they want to catch large animals, for which blowpipes are not suited. In addition, blowpipes are associated with the old way of life, and in particular with headhunting, for which this was the favoured weapon. As such, they have some unfavourable connotations.

Plate 2.4: Two boys with a mousedeer they had caught in a snare-trap (*apung*)

Another important means of catching animals is to set traps. In the past, traps were used to catch large animals, such as boar and sambar deer, as well as people. For such large prey, pit fall traps (*kaab, terimeh*, *peradung*) were used and also spring traps set with spears (*belatik*). These traps are now outlawed by the government because of the danger to people. Today, only traps for small animals are used, an activity most popular among the young boys of the village, such as the brothers photographed with the mousedeer they had caught (plate 2.4). Mousedeer, porcupine

and birds are most commonly caught in snare traps (*ton* and *apung*). Cage-type traps (*ukung*) are also sometimes constructed in the fields, for which the intended prey are monkeys.

2: 3: 1: 4. Sharing the catch

When planning a hunt, an important consideration is that the more people that go along, the less meat there will be to share around. Therefore, groups tend to be kept to a minimum size. The etiquette for sharing the meat is that whoever killed the animal gets the head and also the skin, if this is desired. After this, all parts are divided equally between all the participants. This is regardless of involvement, or expertise, as I discovered when I joined hunting trips. Once the meat has been taken back to the house, the meat is shared out further. If a gun was borrowed, then the owner is given a portion of the meat. Close relatives are always given a portion, as are immediate neighbours.

The sharing of meat can be a somewhat contentious issue, and accusations are occasionally made (behind closed doors) that certain people are not generous when sharing out meat, or that they do not share at all. Certainly the system is now in decline. People often talk of the good old days when the catch from a hunting trip would have been shared between the whole village. Today, this is no longer possible, at least in Long Pasia, because of the large size of the village. In Long Mio, where there are only fifteen households in permanent residence, it is perhaps more surprising that there is little sharing of meat. The reason for this is that there are only a few individuals who regularly hunt, and for them, it is an important source of income. The sale of meat has been a major factor in the decline in the system of sharing meat. I was present on one occasion when a lady bought meat from her own brother, something that made her feel both embarrassed and slightly angry. However, for this man hunting was his main source of income, while she was the wife of a teacher and so was relatively well off. Hunted meat is now commonly sold, both within the village and more widely, as I describe below. Another factor contributing to the decline in meat sharing is that game is becoming harder to find. As forest meat becomes an increasingly scarce resource, people are less willing to share it.

2: 3: 2. 'Going into the river' – fishing

As explained earlier, if someone is going hunting, they say that they are going into the forest (*ame bang fulung*). Similarly, if they are going fishing, then they say they are going into the river (*ame bang abpa*). I would like now to consider what goes on when people 'go into the river'.

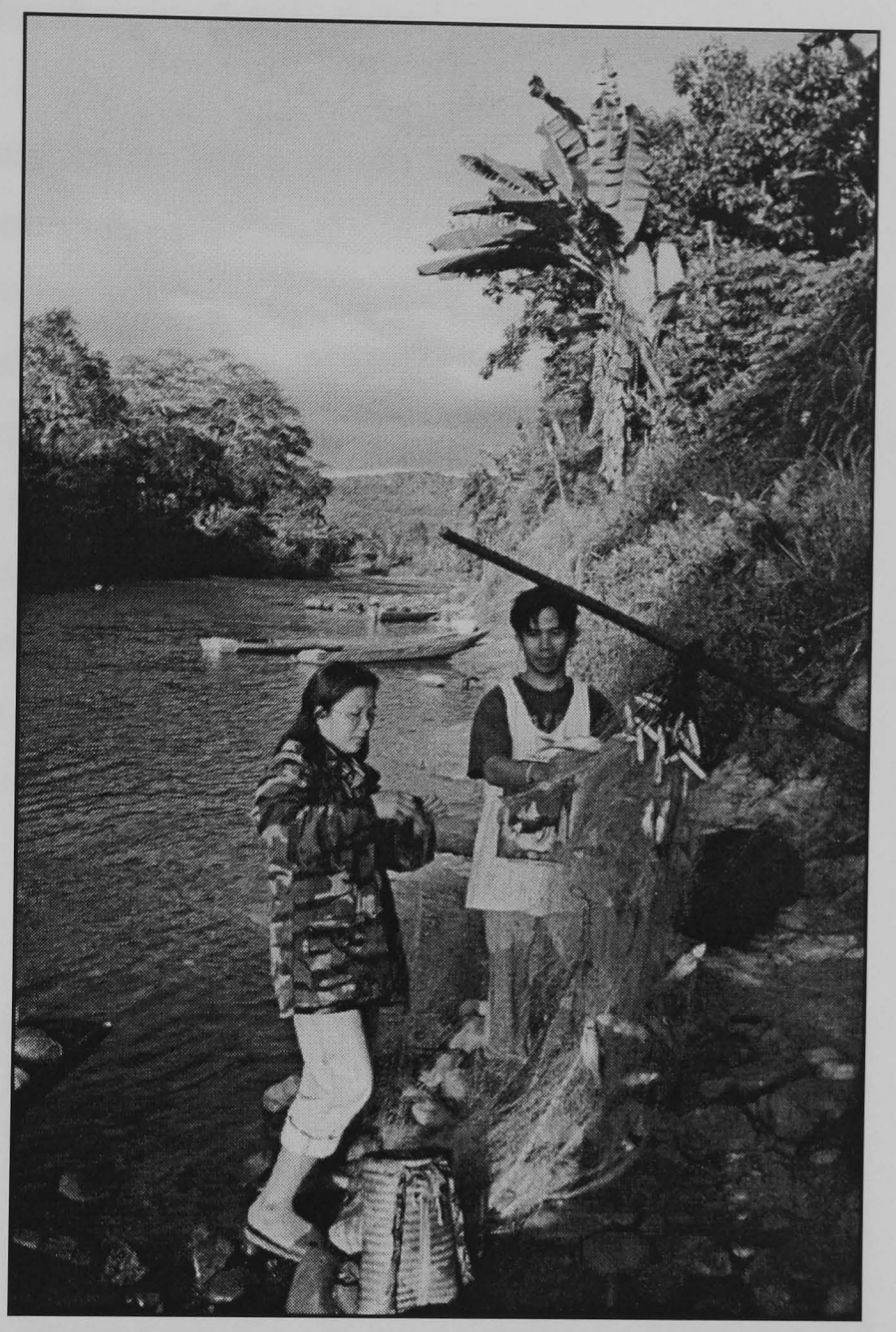
There are many different types of fishing undertaken today, involving a wide range of techniques. These include use of nets, lines, traps, sieves, spearguns and electricity, and take place in rivers, lakes, paddy fields and in recent years, fish ponds.

Drag nets (*pukat*) are usually set along the riverbanks and left here overnight (plate 2.5). *Pukat* are also used for *ngusu lawid*, 'chasing fish'. For this the nets are set across a lake, paddy field or river, and the fish driven into the nets. This can be done by bombarding the water with stones, or by a line of people walking across a paddy field for example, splashing and beating the water surface. Traps (*bubu* or *mering*) are often used in this way as an alternative to *pukat*. In shallow water, sieves (*agag*) or bare hands are also effective. A very easy way to catch fish is to drain the water out of a paddy field, and set traps where the water is flowing out, or use sieves to scoop up the fish.

Cast nets (*rabat*) are most often used when there has been little rain, so that the rivers are not too high or fast-flowing. Most households own a *rabat*, and in dry periods, there are usually people out fishing every day. Massive catches can be made at times when the fish are spawning, which I describe below.

Fishing lines (*keluit* and *lebayan*) are the favoured method of all the village children, for whom fishing is a popular pastime. When school finishes at mid-day a steady stream of children, mainly boys, can be seen heading off towards the river and the paddy fields. Fishing lines are also set in the riverbank, with a spring trap, to be left overnight. For this, bigger hooks are used in order to catch *lawid luang* (*Tor douronensis*), the largest species of fish found in the local rivers.

Plate 2.5: Collecting fish from a drag net (*pukat*)

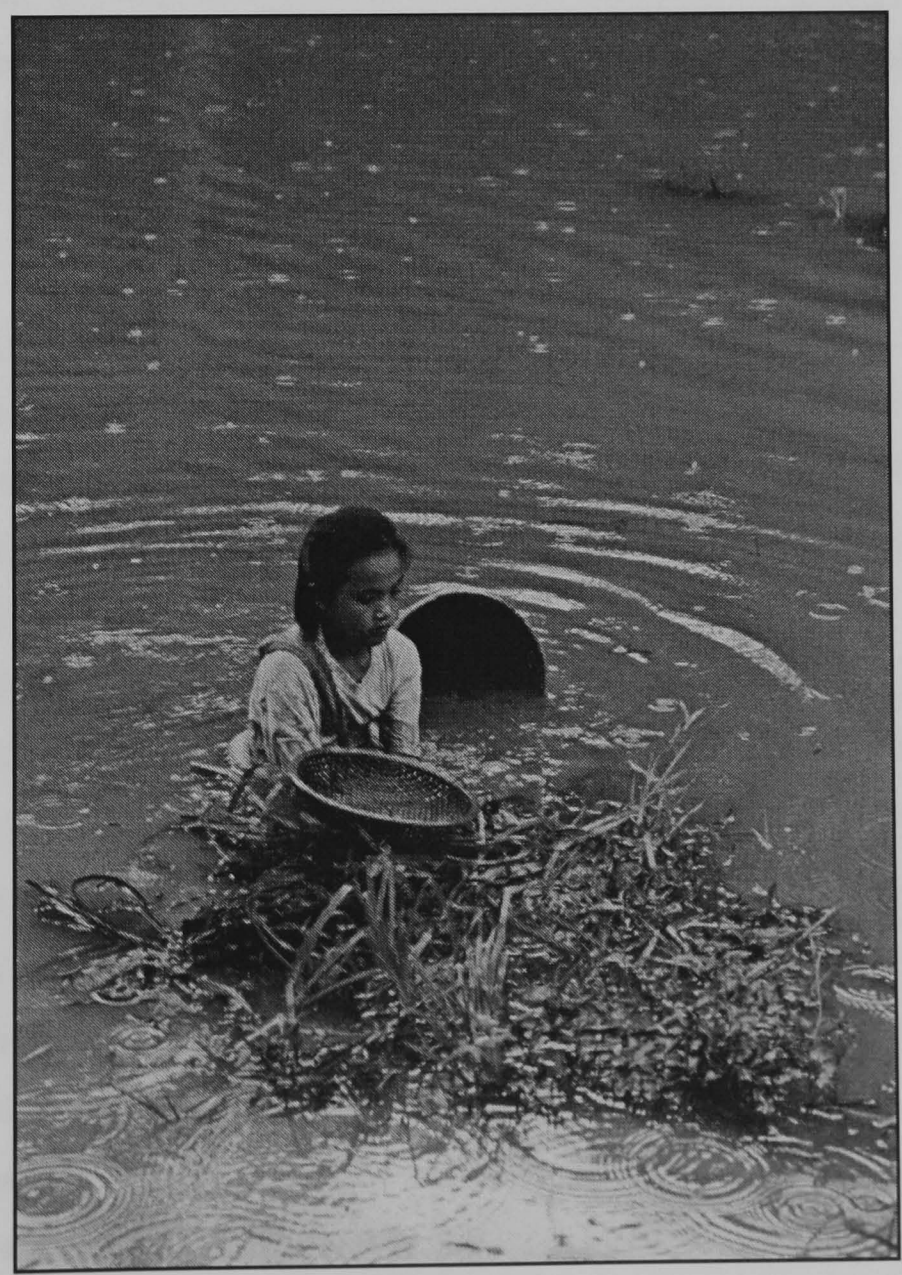


A rarely used method is that of speargunning. This is less popular because not many people own spearguns, and also because larger catches can be made using nets. Speargunning fish is also quite difficult, since diving for the fish is tiring, and the use of a speargun involves considerable skill. In contrast, electricity requires neither much exertion nor skill. There are several people in the village who own generators, and they use these on occasion to electrocute fish. This has the obvious advantage that it is very easy to get large catches, but consequently, has a big impact on the fish population (the reason why this practice has been outlawed by the government). Indeed, there is an awareness within the village of the effects of using electricity, and people often comment that fish are now harder to find. The main reasons that people give for the declining numbers are the increasing human population (both within the

villages and because of the establishment of logging camps), river pollution from logging, and also changing fishing technology.

People suggested to me that with an increased availability of fishing nets it has become much easier to catch fish. This is in comparison to a time, over 50 years ago, when nets were not widely available. Traditionally, people used *lakang* (fish hooks made from bamboo), traps (*bubu*, *taleb*) and fish poison (*ubeh*). Although large catches were made with fish poison, apparently it was rarely used. This is because it involved a lot of work to prepare enough poison, and it could only be used during periods of drought when the rivers were slow flowing. When fish poison was used, the whole village took part, with everyone receiving a share of the fish. Today, fish poisoning is no longer carried out, in part because it is illegal, and also because other modes of fishing are preferred.

Plate 2.6: Collecting snails from a lake



Partly because of the increasing difficulty of finding fish, many people are now building fish ponds. This has also been at the behest of the government, which has been encouraging people to rear tilapia (*Oreochromis niloticus*). These ponds have been popular and successful on the whole, although tilapia are regarded as less tasty than the indigenous fish. By the end of my period of fieldwork there were six fishponds in Long Mio and ten in Long Pasia, half of these having been constructed in the course of that year.

One other resource that should be mentioned here is snails. A larger type (*girig*) are found in streams, but these are rarely collected, because they are so few. More abundant are *akep*, a type of snail to be found in rice paddies and in shallow lakes, living in the mud and on the vegetation growing in the water (rice, sedges and so forth). It is the women who collect snails, either shaking them off the vegetation into sieves, or feeling for them with their hands in the mud (plate 2.6). This is usually done in groups, often the owner of a rice paddy inviting her friends to join her in collecting snails. In Long Mio, no snails are to be found in the paddy fields, because they are not inundated throughout the year. However, there are abundant snails in a nearby oxbow lake.

2: 3: 2: 1. Fish spawning

Fish spawning (*lawid ningaru*) occurs periodically in the Matang River, seemingly triggered by environmental conditions. This event always follows a period of drought, at which time the rivers are very low, almost exposing the gravel banks on which the fish spawn. The nights are also very cold at these times because of the clear skies. The fish are said to spawn only at certain times of the month. The younger people say that this corresponds with certain dates, usually taking place between the 26th and 29th, or failing that, sometime around the 6th or the 16th. The elderly people use a different calendar, saying that the fish follow the moon, spawning only when it is shaped like a bear's head – this is when the moon is just larger than a hemisphere. When I was there the timing of fish spawning events did not correspond with the size of the moon. Nor did they always follow the dates, although it was often close. The dates on which the fish spawned during the time of my fieldwork were: 13th-14th November, 1999; and in the following year (2000), 26th

- 27th January; 15th - 16th May; 1st - 2nd June, in the week of 10th July; 24th – 26th August, and 13th - 14th October. However, this is not to say that there is no basis to these claims, because apparently in recent years fish spawning has become less predictable than it used to be. Local people blame this on the effects of logging on the rivers, which has resulted in siltation and a rise in the water temperature, presumably because the rivers are more exposed to sunlight. Removal of stones from the rivers, to maintain the roads, has also destroyed some spawning sites near Long Mio.

When the fish do spawn, several types are involved, known locally as *arir*, *lepini*, *lipated*, *salap*, and *telamok*. These are all small types of fish. There was one renowned occasion, many years ago, when the *lawid luang* (*Tor douronensis*) spawned. Why they did so is not known, as the larger fish apparently usually spawn in the very deep parts of the river where they are not easily observed.

When spawning takes place, the fish gather at shallow, stony areas in the river during the night. This usually happens three or four times in one night, and over a period of two or three nights. The first fish can sometimes be sighted in the late afternoon or early evening gathering in the shallows. This is a sure sign that the fish will be spawning later that night. The first fish to spawn are the very smallest, *lawid arir* (named after the gravel banks (*arir*) where spawning takes place) being the most abundant. Later that evening, or sometimes the next evening, they are replaced by the larger fish, *lawid salap*. It is this fish that provides the main catch. Another type of fish, *lawid barog*, a large, carnivorous species, also congregate at the shallows at the same time, coming to feed on the spawning fish.

The fish are caught using the *rabat*, and bucket loads can easily be filled. There have been occasions when people were caught unprepared for the fish spawning, and with no *rabat* to hand, resorted to clubbing them with sticks, and scooping them up with their hands. With such large quantities of fish being caught they are usually preserved, either through smoking or pickling. Even so, such an event produces a glut of fish. This is apparent from the dietary survey data. During the second week of surveys conducted in Long Pasia the fish spawned. Consequently, in this week, fish

made up a much greater part of the diet than usual, as I discuss in the following chapter.

2: 3: 3. Gathering forest resources

The phrase 'hunting and gathering' is widely used to describe non-agricultural societies, and so, 'gathering' is used to refer to all those activities that fall outside of agriculture and hunting. It is in this sense that I have entitled this section 'gathering', although I use this word with some trepidation, implying as it does a lack of thought or planning in such activities. Similarly, I use the term 'forest resources' in contrast to those that are formally cultivated. Such a distinction is overly simplistic, as I discuss in chapter four.

2: 3: 3: 1. Insect foods

Insect foods do not constitute an important part of the diet for the Lundayeh today. However, there are a few people who love to eat certain species, and will go out of their way to find them. There are many different types of insect that can be eaten: bees (and their honey), grasshoppers, beetles, cicadas, and various grubs.

Honey is collected from the wild bee (*Apis dorsata* (Chung, pers.comm.)), known locally as *tebikan*. *Tebikan* usually build their nests in *binuang* trees (probably *Shorea* spp.), the nests suspended from the underside of branches. This tree is tall, growing over 30m high, and there are not many men nowadays who are brave enough to climb to the heights of a tree to collect honey, particularly when it is so easy to buy sugar instead. There is perhaps good reason to be wary of climbing high into the canopy, as there are several stories of people who have died after falling from trees while collecting honey. In fact, it is said that spirits guard the nests of *tebikan*, and that unless you call out beforehand to scare the spirits away, they will cause you to fall. Sometimes though, nests are to be found lower in the canopy, in which case they will be collected (plate 2.7). The nest in the photograph was empty, and the last time that someone from either Long Pasia or Long Mio had actually collected honey was two years ago.

Plate 2.7: Checking a bee's nest for honey

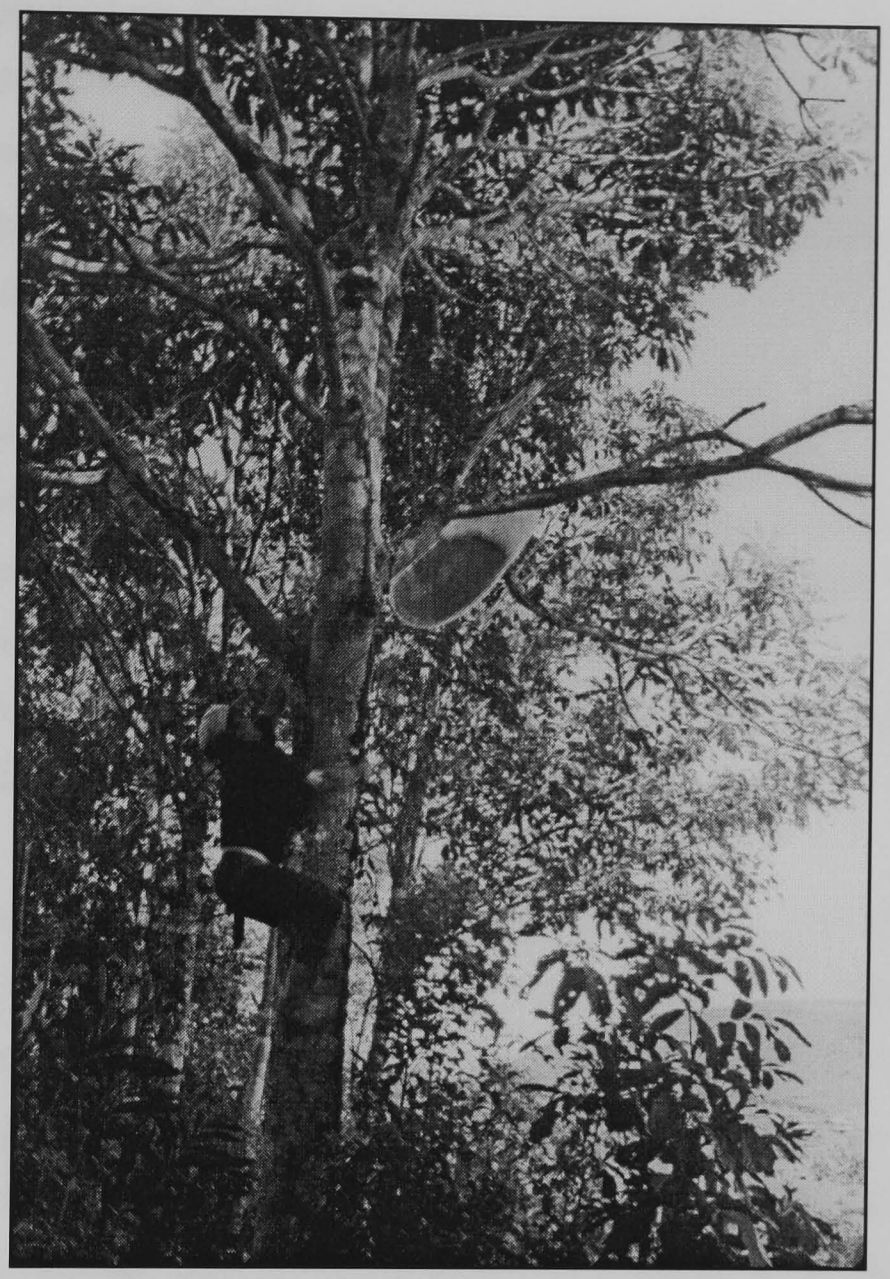


Plate 2.8: The moth larvae *kelatang*

Another bee, *berinuen*, also produces honey[6]. However, this honey is rarely collected. People told me that they were nervous about eating the honey of this bee, as it can sometimes be poisonous. This was thought to be the case if the bees had fed on the nectar of *limuan* (*Gelsemium elegans*), a highly poisonous vine (apparently used by people to commit suicide). If this honey is collected, people may feed a small amount to their dogs first, to check whether it produces any adverse effects.

The larvae of some types of bee are eaten, including *tebikan* and also those of *belug* (stinging hornets or night wasps (Ganang, unpubl.)). These larvae are only occasionally collected, those of *belug* more commonly than those of *tebikan*. This is because their nests are easier to reach, and also because the best time to collect them is in the daytime, when the wasps are not active. To collect *tebikan* larvae (or honey), it is best to wait until night-time when these bees are inactive.

There are two types of beetle grub that are collected for food. One of these, *wet*, is the sago grub, *Rhynchophorus ferrugineus* (Chung, pers.comm.). Despite its name, this grub is not found exclusively in the sago palm. In the area of Long Pasia and Long Mio this grub is most commonly harvested from the stems of *deremeh* (*Arenga brevipes*) and in the young shoots of the bamboo, *bulu telang* (*Schizostachyum brachycladum*). Another grub, known as *kelatang*, is found in the trunks of the tree *beling uled* (*Lithocarpus* sp.) (plate 2.8). This grub, probably a moth larva of the family Cossidae (Chung, pers.comm.), is strongly scented, and provokes similarly strong reactions in people – you either love it or hate it. It is also sought after for its medicinal properties, being used to treat bad stomachs, and to get rid of ticks on dogs.

Very rarely eaten are some species of beetle, cicadas, crickets and *kaber* (various types of small, beetle-like insect). During my year there, I was unaware of anyone eating these, except to show them to me. The edible beetles pointed out to me were species of long-horned beetles (a species of *Diastocera* and of *Anoplophora*, Cerambycidae (Chung, pers.comm.)). The larger types of cicada, such as *sibebper* (a

[6] I was unable to identify this bee. It differs in both its appearance and behaviour from *tebikan*, nesting inside hollow tree trunks. There are apparently three other species of wild honey bee in Sabah (Chung, pers.comm.).

large, green cicada), can also be eaten, although only a few people had ever tried these. Most people had eaten crickets, although not for many years. Many of the adults told me that they had eaten crickets as a child, usually at times when there was a glut of them in the fields. The consumption of all insect foods is in decline, as I discuss in the following chapter.

2: 3: 3: 2. Fruit and vegetables

Of much greater importance, at least in terms of volume contributed to the diet, are vegetables and fruits. I describe their role in the Lundayeh diet in detail in chapter three, so I will only give a very brief overview here.

Plate 2.9: Collecting vegetables from the riverside

The vegetables used include leafy greens (*kerid*), the pith of various monocotyledenous species (*ubud*), mushrooms (*kulat*) and roots (*ubi*). These are mostly collected by the women (plate 2.9). Many vegetables are gathered when women are at the fields or on their way home, collected from within the fields and the surrounding vegetation. When not involved in agricultural work, small groups of women often go off together to collect vegetables (*ngerin*), or children may be sent off in the afternoon to gather vegetables for the evening meal. Many of the green leafy vegetables are collected from the riverbanks.

Palm stems (*ubud*) are usually collected by men (plate 2.10). This is partly because palms tend to be found further from the village, in old growth forest. Men often bring back palm stems after they have been out hunting in the forest, especially if they have not found any game. Also important is the fact that harvesting these requires some skill, particularly the spiny rattans, something at which many of the women are not adept.

Roots of forest species are a food resource that is not commonly used, cultivated varieties being preferred. The only roots that are used are those of *Alocasia* (*ufa'*), and possibly *Dioscorea* species, (although I was unable to collect any specimens of these). Their importance was perhaps greater in the past, when they were eaten mainly as a famine food, or when people were caught out in the forest with a shortage of rice. Another food resource that I was told was eaten as a famine food in the past, but is no longer used, is sago (*nangeh*). This was collected from *kinangan* (*Eugeissona utilis*). Today, the only people who know how to collect and process this are some of the elderly villagers.

Fruits are an important food resource, particularly for children. Fruits are most often collected in passing, if people chance upon some ripe fruits. However, there are some fruits that people will go out of their way for. Durians (*Durio* spp.) are perhaps the most popular, and collecting expeditions are organised when there are trees fruiting. Also favoured are mangoes (*Mangifera* spp.), rambutans (*Nephelium* spp.), and some types of chestnut (*Castanopsis* spp.).

Plate 2.10: Collecting *ubud* of the rattan *Daemonorops ingens* (*wei belikakau*)

Another important plant resource that is related to food, although not edible itself, are the leaves used to wrap rice. A variety of species are used (table 2.5). Most commonly used are banana leaves, as these are in abundant supply around the villages. However, the leaves of *daun itip* (*Phrynium capitatum*) are preferred to make the rice cakes served at weddings and other special occasions.

Table 2.5: Leaves used to wrap rice

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Kayu bina / binua / binasing dara'	Euphorbiaceae	*Macaranga* sp.
Daun itip	Marantaceae	*Phrynium capitatum* Willd.
Daun arid	Moraceae	*Ficus megaleia* Corner
Bong; liawan; sibak;	Musaceae	*Musa* spp.
Terabak	Zingiberaceae	*Alpinia glabra* Ridl. / *A. nieuwenhuizii* Val.
Baku ucat	Zingiberaceae	*Etlingera elatior* (Jack) R.M. Smith
Baku	Zingiberaceae	*Etlingera punicea* (Roxb.) R.M. Smith

2: 3: 3: 3. Fuelwood and construction materials

Fuelwood is a resource that is becoming increasingly scarce, because of the expanding population and also the increasing privatisation of resources. Until recently, many of the people of Long Pasia collected firewood from an area of heath forest about one mile away. However, the owner of this land banned its collection because it was being rapidly depleted. Firewood is now very hard to come by within walking distance of the village, and consequently, people are travelling further and further afield. They are enabled in this by the availability of transport from the lorries that maintain the logging road. As part of a deal made with the company that does this work, they help out the villagers by allowing the occasional use of their lorries to transport firewood and also planks for house building (plate 2.11).

Wood for construction is another important resource. The preferred species are *marid* (*Shorea* spp.), *tumuh* (*Agathis* spp.) and *fidaawee* (*Castanopsis acuminatissima*), these being the most durable. During the time of my fieldwork, twenty-six new houses were built in the two villages, or were in the process of being built. Both villages were also building new churches with wood sawn from the forest. A major reason for this sudden spate of house-building has been the realisation that in a few years time trees with good quality timber will be very hard to come by, and there

may not be lorries available to transport the planks. An additional factor is that sites for houses are in short supply, and so people want to stake a claim to these now by building on them.

Plate 2.11: Planks sawn by the villagers, placed at the side of the logging road for collection by lorry

Today, all houses are made of wooden planks, with the exception of two recently built concrete houses, and all have zinc roofing. The first plank house was apparently built in the 1960s. Prior to this, people used split bamboo, (either *bulu telang* (*Schizostachyum brachycladum*), or *bulu betung* (*Gigantochloa levis*)) and roofing of palm leaves, most commonly using the leaves of *kinangan* (*Eugeissona utilis*) or *deremeh* (*Arenga brevipes*). The shift to building wooden houses was encouraged by the establishment of more permanent settlements, since it is only worth investing the time and effort in building a wooden house if you are going to live in it for a long time. It was also enabled by the availability of chainsaws, which allow much faster

sawing of planks than manual saws. Chainsaws are still a much-prized commodity, these often making up part of a girl's bride price. The appearance of the two concrete houses, just in the last year, reflects in part an increased availability of money, a desire for 'modern' houses, as well as the decision by the men of these households that they did not want to spend their time sawing planks. In future, shortage of timber could further encourage this trend.

People still use bamboo to build their fieldhouses and rice storage huts, although planks are sometimes used for these too. Bamboos are also used for fencing, and various plants are used as rope to tie these together. Most commonly rattans are used for this purpose, for example, *wei leludu* (*Calamus convallium*) or *wei lingan* (*Daemonorops sabut*), but if these are not available, the bark of a number of species can be used, such as the vine *war tulang* (*Spatholobus* sp.) or the tree *kayu talun* (*Artocarpus* sp.).

Both rattans and bamboos are important weaving materials (plate 2.12). They are used to make carrying and storage baskets, winnowing trays, baby carriers and house decorations. These items are still widely made and used, although new materials are increasingly being used, as are shop-bought items. Plastic strips are becoming popular for making the carrying baskets. This is because they are hard-wearing, can be bought in bright colours, and no preparation is required, (unlike rattan or bamboo, the stems of which must be scraped, split, and painted before use). Plant based dyes are rarely used nowadays, and only a few people have the knowledge of how to prepare these. Once again, this is because of the ease of buying dyes from the shops, and because shop-bought dyes are available in many colours. In tables 2.6 and 2.7 I have listed the species used in making baskets, and also the dyes that are used.

The other woven items are mats (*ugam*), the best quality being made from the sedge, *sier* (*Fimbristylis umbellaris*). Another species of sedge, *lebping* (possibly *Schoenoplectus mucronatus*, (Christensen, 1997)) is also used, but this has thicker stems and so does not produce such fine mats. Both these sedges are planted in old paddy fields and ponds, but also self-seed. *Kaber* (*Pandanus* sp.) is used to make very coarse mats, used in the field-huts and for drying rice, coffee and so forth. Woven mats are still popular, but plastic linoleum is also commonly used, and has

Plate 2.12: Women carrying bundles of bamboo stems of *Schizostachyum latifolium* (*bulu poren*), for use in weaving

come to be more or less an essential item in the living room of most families. Weaving skills are in decline, particularly among the men, who make their own carrying baskets and finish off the women's baskets. However, among the women there has been a recent revival of interest in these skills. This has in part been stimulated by tourism, which has created a small market for the baskets and mats.

Table 2.6: Species used in weaving

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME	USE
Bulu ee	Poaceae	*Bambusa vulgaris* Schrad. ex Wendland	Used to make needles (*ee*) used in weaving mats
Bulu poren	Poaceae	*Schizostachyum latifolium* Gamble	Weaving baby carriers & winnowing trays (*rinu*)
Ilad	Arecaceae	*Licuala* sp.	Weaving hats (*rong*)
Wei darii	Arecaceae	*Calamus javensis* Blume	Weaving baskets
Wei laasun	Arecaceae	*Daemonorops ingens* J.Dransf.	Weaving baskets
Wei lingan	Arecaceae	*Daemonorops sabut* Becc.	Weaving baskets
Wei peit	Arecaceae	*Calamus pogonacanthus* Becc. ex Winkl.	Weaving baskets
Wei sia	Arecaceae	*Daemonorops fissa* Blume	Weaving baskets
Wei tua / peit arem	Arecaceae	*Calamus marginatus* (Blume) Mart.	Weaving baskets

Table 2.7: Species used as a source of dye

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME	PLANT PART USED	COLOUR PRODUCED
Ipang	Acanthaceae	*Peristrophe bivalvis* (L.) Merr.	Leaves	Red
Uber	Euphorbiaceae	*Glochidion* sp.	Bark	Black
Bua kurad	Arecaceae	*Daemonorops didymophylla* Becc.	Fruits	Red

2: 3: 3: 4. Medicinals

Forest resources are important as a source of medicines. Although their use seems to be in decline, such knowledge among the younger generation being very limited, local medicines are still widely used. This is in spite of the early influence of missionaries, and the fact that other medical systems are now readily accessible. Apparently, during the early years of missionary activity, the church discouraged people from using all traditional remedies. Nowadays, however, most pastors are more open-minded, recognising that certain remedies are effective. Today, there is a

clinic in Long Pasia, staffed by two nurses. This provides basic healthcare, and free medicines such as cough mixtures and paracetamol, as well as a midwifery service. A doctor also visits about once a month, but usually, if people wish to consult a doctor, they have to go down to the hospital in Sipitang. A fee is charged for a consultation and for medicines. These medical services are widely used, although many people try to avoid going to see the doctor because of the expense involved. Chinese medicines are also popular, and there are several practitioners in Sipitang who are regularly visited by villagers.

These health systems have not replaced the use of local medicines. Rather, people tend to use a combination of the different medical systems, perhaps using a local medicine if they have had success with it in the past, or resorting to these if medicines from the hospital do not work. In fact, it is believed that certain types of illness can only be cured by local medicines. These are those illnesses that have been caused by someone using charms (*felamai*) or poisons (*urep*). Although this is said to happen only rarely today, there are still occurrences. Apparently there are a few individuals knowledgeable in the use of such charms, although people were loath to mention any names. I was more often told that it is the Murut people who have an extensive knowledge of such charms. Certainly, in the past there was a great deal of mistrust, if not fear, of their Murut neighbours because of this.

Knowledge of charms is not something that people will readily admit to. These can be used, not only to harm people, but also for more benign reasons, for example, to attract a boy or girl, or to protect yourself or your child against illness or misfortune. Knowledge of those plants used as antidotes seems more widespread, or this may simply reflect the fact that people were more ready to talk about these, while not being willing to admit to knowledge of the charms themselves. This aspect of the traditional 'medical' system is still strongly disapproved of by the church, and it is generally regarded as something to be discouraged. Consequently, many of the younger people know nothing about this aspect of medicinal knowledge.

However, I do not want to over-emphasise this aspect of Lundayeh medicinal knowledge. The most commonly used medicines are those for a bad stomach or fever, not surprisingly, as these are the most common ailments. Also widely used are

various medicines that are said to promote fast healing, if someone has had a bad fall for example.

What can be defined as a medicine is often difficult to determine, the line between medicine and food being hazy. Many foods have medicinal properties, or they are used in a therapeutic way (Etkin, 1994; Johns, 1990). The Lundayeh believe certain of their foods to be strengthening, or good to eat if you have a particular illness. For example, bitter tasting vegetables are apparently good for those suffering either from diarrhoea or stomach ulcers. I did not collect comprehensive data on medicinal resources (in part because of concern over issues related to bioprospecting). However, those foods that are used medicinally were documented (see tables 2.8 & 2.9).

2: 3: 4. Selling forest resources

There has been a long history of trade in forest products by the peoples of Borneo (Jessup, 1981; Padoch, 1982: 106-107; Sellato, 1994: 164). In the past, this trade was mainly for the purchase of salt, sugar, iron and also cloth. Items such as Chinese jars, gongs and beads were also bought, these being items of prestige and wealth in many Bornean societies. Today, people's need for cash income has increased dramatically. The most pressing needs cited by people are those of schooling their children, and medical expenses. Increasing amounts of manufactured goods are also both needed and desired.

In spite of this, there has been a steady decline in the collection of forest products for sale among the Lundayeh, and more widely in Borneo (Padoch, 1982: 109). This is partly because of the declining demand for many of these products, and also because of a changing way of life, many young people having little interest in spending long periods of time in the forest. This trend has been exacerbated by the increased availability of more lucrative wage labour opportunities, particularly in the logging industry. However, the collection of forest products is still important for many people in Long Mio and Long Pasia. At certain times of year, this activity provides the only source of income for some families.

Table 2.8: Plant foods used medicinally

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME	PART USED	USE
Wei leludu	Arecaceae	*Calamus convallium* J. Dransf.	Stem pith	To treat abdominal pain.
Sayur peit / Sedai / Sesei	Brassicaceae	*Brassica juncea* (L.) Czern.	Leaves	To treat diarrhoea.
Peria	Cucurbitaceae	*Momordica charantia* L.	Fruit	To treat diarrhoea.
Tadjak fadey	Cucurbitaceae	*Benincasa hispida* (Thunb. ex Murray) Cogn.	Leaves	To treat diarrhoea.
Tadjak	Cucurbitaceae	*Cucurbita* spp.	Leaves	To treat diarrhoea.
Siluk fulung	Costaceae	*Costus speciosus* (Koenig) R.M. Sm.	Stem pith	To strengthen sickly children, or to treat flu or colds.
Bua lipau	Euphorbiaceae	*Baccaurea lanceolata* (Miq.) Muell.Arg.	Fruit	To treat diarrhoea.
Bua fatar	Fabaceae	*Parkia* sp.	Seeds	Antidote for many illnesses, e.g. high blood pressure, diabetes and diarrhoea.
War sia	Fabaceae	*Spatholobus* sp.	Sap	To treat diarrhoea.
Pau bulat	Oleanchaceae	*Nephrolepis biserrata* (Sw.) Schott	Young shoots	To strengthen the body, especially after a fever.
Bua biterung eit lipon	Solanaceae	*Solanum capsicoides* All.	Fruit	To treat toothache.
Bua sifei'	Urticaceae	*Debregeasia longifolia* (Burm.f.) Wedd.	Fruit	To treat diarrhoea.
Bua tadjak fadey	Cucurbitaceae	*Benincasa hispida* (Thunb. ex Murray) Cogn.	Fruit	To dispel wind / heat.
Likua	Zingiberaceae	*Alpinia galanga* Willd.	Rhizome	To dispel wind / heat, especially after childbirth.
Halia	Zingiberaceae	*Zingiber officinale* Roscoe	Rhizome	To dispel wind / heat, especially after childbirth.

Table 2.9: Animal foods used medicinally

LUNDAYEH NAME	ENGLISH NAME	USE
Kelatang	Larvae of a moth, family Cossidae.	To treat diarrhoea.
Lawid udun	A species of catfish.	To aid healing of wounds.
Pecuh lawid	Intestines of various fish species.	To strengthen the body, and for general health.

The products that are traded have changed over the years, largely in response to market demand. Rubbers used to be the most important product. Nearly all the rubber was collected from the vine *war kelang* (*Willughbeia coriacea*), although other trees were also tapped. With the widespread development of *Hevea* rubber tree plantations in the 1950s, together with the development of synthetic materials such as plastics, the market for wild rubbers collapsed and its collection ceased (Padoch, 1982: 109; Seling & Langub, 1989). Similarly, damar (known locally as *ilu*), the resin of the *Agathis* tree, used to be an important product, but is no longer traded. Damar is still collected on a small scale, but only for domestic use, as the resin provides an easy way to kindle a fire. *Agathis*, although no longer highly valued for its resin, is now a resource in a much more lucrative trade, that of timber. It produces a high quality timber, and it is this tree in particular that brings the loggers to the area. Local people are also involved in this trade, through selling rights to the timber on their land, an issue I discuss in chapter six.

There has been some trade in cinnamon, this mainly taking place about 10-15 years ago. This spice was being collected from the forest, for sale in the local towns. However, local supplies were rapidly exhausted, something that is blamed on the young men of the time, who apparently chopped all the trees down. Today, only young trees are found scattered in the forest near the villages. Many people have planted cinnamon trees in their fields, some with seedlings collected from the forest, others with those from the lowlands. At present, these only provide enough for domestic use, predominantly used to flavour coffee.

Today, the main resource that is sold is game meat, and to a lesser extent fish. The trade in wild meat is widespread in Borneo. For Sarawak alone the value of this trade has been estimated at $3.75 million dollars per year (Bennett et al., 2000: 321). In the Ulu Padas, the sale of meat and fish has been going on for many years. People used to take meat on the plane down to Lawas when there was a weekly flight to Long Pasia. The restrictions on baggage weight and the infrequent flights meant that there were limitations on this trade. With the availability of regular road transport this is no longer the case, and consequently, the trade has grown in the last couple of years. The trade in meat is mostly of boar, although sambar deer meat is also sold, and very occasionally barking deer meat. Deer meat is sold illicitly, often being referred to as

boar meat when it is being sold, because its sale is illegal under Sabah's Fauna Conservation Ordinance (1963). The village price of meat varies from 5RM to 7RM per kilo, but in the Sipitang area, it sells for 10-12RM. The price of fish is similar, about 5RM per kilo, this only being sold locally, either in the village or logging camps.

For a few families, the sale of meat and fish is one of their main sources of income. One family in Long Mio, and three families in Long Pasia, included someone who was identified within the villages as a professional hunter and / or fisherman. They were referred to in this way because they all spent more time hunting or fishing than in any other activity, including agriculture. Thus, one man of Long Mio sets fishing nets every day, providing that the river is low, and sells the fish either in the village or at the logging camps. In a good week, he could apparently make as much as 150RM. Three men of Long Pasia both spent over half their days out in the forest, hunting boar (until they all went to work in the logging camps towards the end of my fieldwork period). If a large boar is caught, over 300RM can be made. For many other people, although they may spend more of their time involved in agriculture, hunting and fishing still provides a welcome additional source of income.

Another resource that is sold in town is medicinals. A few of the villagers regularly collect *keri buro* (*Boesenbergia stenophylla*) for sale to Chinese medicinal practitioners, a sackful commanding a price of 100RM. Another plant that is sold is the ant plant, *angang* (*Myrmecodia* sp.), apparently a large plant selling for as much as 30RM. This is only occasionally collected by local people. During the time of my fieldwork, members of the Border Scouts, who have a camp near to Long Pasia, collected large quantities of this plant for sale. As I mentioned in the section on hunting, some animal products are sold as medicines. These include the gallbladders of bears and bearcats, which are sold for as much as 300RM each, and also the foreleg bones of the sambar deer, these selling for 50RM a kilo.

A recent development, just in the last couple of years, is that people have started to sell vegetables within the villages. Most of these are cultivated ones, but a few people also sell non-cultivated vegetables, such as bamboo shoots (*Gigantochloa levis* and *Schizostachyum brachycladum*), *tengayen* (*Pouzolzia hirta*), *pau*

(*Diplazium esculentum*) and mushrooms. These activities developed from people selling vegetables to the logging camps. It is still viewed with some unease by many people, who cite how people used to freely share their vegetables. Trade with the logging camps expanded greatly during the year of my fieldwork, because of the establishment of several camps near to the villages. At the end of my time there, weekly trips were being made to the logging camps by the women of Long Mio to sell their produce. Typically, they each made between 20 and 50RM on one of these trips. Most in demand are cultivated vegetables, but fern tips and bamboo shoots are also sold, as well as fish and game.

Vegetables are not usually taken down to Sipitang for sale. The reason for this is that not enough profit can be made to cover the costs of transport – a return trip costs 40RM per person, and a charge is usually made for carrying heavy, bulky goods, especially if these are for sale. If people are going to town anyway, they will sometimes take produce to be sold. Those sold are *tengayen* (*Pouzolzia hirta*), *pau* (*Diplazium esculentum*), *siluk* (*Commelina paludosa*), *bua beludu* (young inflorescences of *Etlingera elatior*), *bua fatar* (the fruits of *Parkia* sp.) and *bua fayang* (fruits of *Pangium edule*). Sweet fruits (i.e. not those fruits eaten as vegetables) are never sold. This is mainly because such fruits are never found in great abundance, and also because they are difficult to transport.

Another resource that is sold is woven items. Baskets and mats are sold to visitors, and there is also some trade between the villagers themselves. Those items that are most commonly sold within the village are the men's carrying baskets and the baby carriers, because there are only a few individuals skilled at making these. However, income from the sale of these is very sporadic, and at a low level. For other villagers, a small basket or a mat is sold for 20-30RM, while the larger baskets can be up to 80RM, prices being doubled for tourists. Sometimes there is a particular demand, for example, the occasion of a marriage. One couple made 200RM from the sale of ten baskets to another family, these to be given as part of the exchange of wedding gifts.

In the last few years, the forest as a whole has become a commodity, being 'sold' to tourists. The sale has not been literal, rather the forest is used as a resource to encourage tourists to come to the area. There has been a steady, if small, flow of

tourists to the village in the last five years, and they come wanting to see an 'unspoilt' part of Sabah, and to go jungle trekking and on river trips. This provides income to many villagers, through work as guides or provision of 'home-stays'.

2: 4. Of rice and men – the agricultural system

The agricultural system of the Lundayeh is centred around the production of hill rice, this crop taking priority over all others. However, the situation is changing, with the expansion of wet rice fields, and increasing land and effort being put into cash crops. I will consider these changes further below, but in the meantime, I want to describe the more traditional aspects of the agricultural system, which are those associated with the production of hill rice (plate 2.13).

Plate 2.13: Harvesting hill rice

The agricultural year begins in July, the time at which decisions are made regarding where people will make fields for that year. These decisions are made on the basis of availability of land, age of secondary vegetation, distance to the land, and what everyone else is doing. 60% of the households in Long Mio and 74% of those in Long Pasia own land. This land situation is a result of a number of factors, namely,

history, personal opportunities and government policy. Most of those who own land are members of the families that founded the villages, while nearly all of those families that moved to the Ulu Padas from Indonesia in the last ten years have no land. The few exceptions are those who have been able to buy land. Land is now recognised as a highly valuable commodity, an issue that I discuss in chapter six.

Those who do not own land, have to rely on borrowing or renting land from others. Usually this is free, some form of payment only being asked for if cash crops are being planted. Payment may simply be a proportion of the harvest, for example, if vegetables are being grown, the owner of the land will usually be invited to help himself to these, with the understanding that this is only for his own domestic consumption. Alternatively, if the land is being more intensively used and greater profits can be expected, for example, from the sale of tobacco, the cost may be as much as a pig (equivalent to several hundred ringgit). Sometimes land is made available because the owner would like it to be cleared. For example, the headman of Long Pasia offered a large tract of his land for rice cultivation because in future years he plans to cultivate cash crops here. In allowing people to plant rice on his land he benefits by not having to clear the forest himself.

Today, the people of Long Mio and Long Pasia only make fields in areas of secondary vegetation, rather than in old growth forest. In the past, both would have been utilised. One reason for this change is that there is no longer any old growth forest close to the villages. Furthermore, felling the large trees found in old growth forest is very hard work, so people prefer to choose land covered with secondary forest when selecting new field sites.

The usual fallow period is between five and ten years. If it is shorter than this, there will be too many weeds, and if it is any longer, then the trees are very large. In recent years, there has been a trend towards shortening the fallow period, and some of the land adjacent to Long Pasia has been used in consecutive years. This practice is not common, because a drop in yield is normally seen in the second year of cultivation. However, people are encouraged to do so by the shortage of land close to the village, and also, the availability of commercial weed-killers. These are not widely used on hill rice fields, generally being used only in paddy fields, but a few people do use

them on land that has not been many years in fallow as weeds tend to be a greater problem here.

When deciding on where to make rice fields, distance and what other people are doing are closely linked. This is because most people want to locate their fields close to those of others, so that work sharing is easy. For example, several families in Long Pasia have land upriver of the village, the furthest involving a one to two hour boat ride (when going upstream, and depending on river conditions). When farming these sites, people tend to live at their field houses during the busy periods of the year, such as harvesting and sowing. If several families are all living there together, work sharing is possible, and it is also more sociable. For these reasons, a group of families will usually decide together whether to farm these more distant sites.

Once the location has been decided, the next decision is when to start clearing the land. This has to be done in anticipation of a dry spell of weather, since following clearing the land needs to be burnt fairly soon after. In the past, the timing of the various stages of rice cultivation was decided with reference to the pattern of the stars, a practice still followed in the Sipitang region in the late 1960s (Crain, 1973). Today, at least in the Ulu Padas, no-one refers to the stars for guidance, relying purely on personal judgement and previous experience. The main stages of rice cultivation, and the timing of these, are summarised in table 2.10.

Table 2.10: The agricultural year for hill-rice cultivation

MONTH:	ACTIVITY:	
June – July	Clearing forest:	clearing shrubs & undergrowth (*lemidik*) felling trees (*temara'*)
August – September	Burning fields:	burning (*notong*) clearing away un-burnt logs(*temuaa*)
August – October	Planting of rice:	dibbling (*nguan*) sowing seed (*maraa*)
October – December	Weeding:	(*demamu*)
January – April	Harvesting:	(*ngerani*)

Clearing the land involves cutting down all the undergrowth, small trees and shrubs (*lemidik*) with a parang (*karit*). This is usually done in work parties, involving both men and women. A line of people will stretch across the land, the men proceeding

first, cutting the larger trees, and the women behind. Following *lemidik*, the large trees are felled (*temara'*) with chainsaws, work that is done exclusively by men. At this stage a dry period of several days is needed so that the cut vegetation dries out, and a good burn can be achieved (plate 2.14). Ideally, burning (*notong*) is carried out four to ten days after clearing. Any longer than this and new shoots start appearing, and it will not burn well. Following burning, the final stage of preparation is to clear any large logs that have not been burnt (*temuaa*).

Plate 2.14: Recently cleared swidden fields, prior to burning

In September and October, people plant their fields. Although this is mostly done by the women, it is not exclusively so. The men will often precede the women across the field, dibbling the holes (*nguan*) while the women follow, sowing the seed (*maraa*). After about a month, usually as soon as all the fields have been planted, weeding begins. Weeding (*demamu*) is the responsibility of the women. The fields are only weeded once, and can then be left until harvest time. Harvesting begins in January, and can last up to the beginning of April, if planting was late.

I mentioned above the practice of work sharing. An important reason for this practice is that it mobilises all the available labour during busy periods, ensuring that work in a particular field is completed quickly. Equally important is the fact that working in

groups is far more enjoyable and sociable. There are a number of ways in which work sharing takes place. It can be in the form of a *gotong royung*, in which all community members, or a particular group (such as the women, men or the youth) are called on to attend. When someone plans to hold a *gotong royung*, they make an announcement in the village, calling people to attend on a particular day. A fee of 3RM is paid to the church for every person that shows up, and the hosts are also expected to provide a ready supply of drinks and cakes throughout the day. Some people also provide additional side-dishes to eat with the mid-day meal (everyone bringing their own rice), particularly if they have recently had a successful hunting trip.

The practice of *gotong royung* replaced a previous system of work-sharing known as *ngerufan* or *musang*, a change that was encouraged by the SIB church (Janowski, 1987). *Ngerufan* and *musang*, still practised in the late 1960s, were agricultural feasts hosted by one family. The participants would work in the fields through the morning, with a feast being laid on in the afternoon (Crain, 1973). *Musang* were relatively small in scale, but *ngerufan* were much larger, with invitations to attend being extended to members of other longhouses, as well as that of the host family. The latter were most often held during the harvesting season. Pigs or a buffalo were slaughtered to provide food for such an event, and *borak* (rice wine) served. (This was replaced by coffee in more recent years after drinking practices had changed.) Because of the costs involved, such feasts were only hosted by the better off families, for whom they were also a means of gaining prestige.

Some parallels can be drawn between the previous system of agricultural feasts and their present-day manifestation as *gotong royung*. Thus, it is still generally expected that the better off families should host more of these events. Similarly, while the food provided is nowhere near as lavish as that associated with *ngerufan* and *musang*, there is still an obligation to provide some food, and much praise is given to those who are particularly generous in this, for example, those who offer large amounts of meat for the mid-day meal.

In Long Mio, all large work parties take this form. In Long Pasia it is more common to employ a system of labour called *feruyud*. Under this system, several families will

decide to work together, taking it in turns to work on each other's fields. Usually, four or five families co-operate in this way, although occasionally as many as ten families may be involved. As with *gotong royung*, whoever's land is being worked provides drinks and snacks, and occasionally side-dishes for those participating. In Long Pasia, *gotong royung* are only used by the wealthier families, or if a family falls behind with their work, perhaps because they have decided to make larger fields this year. In Long Mio they say that they cannot do *feruyud* because there are too few families. However, this does take place on a very small scale between close relatives, for example, siblings or parents and children often work their fields together.

Work sharing takes place at all stages of the agricultural cycle – clearing the forest, planting, weeding and harvesting. A recent development has been people offering waged labour, a change in the last five years. Typically, it is those couples who have recently returned to the village after retirement who employ people in this way, as it is these people who have money and who are less experienced in farming. These opportunities are popular among many of the younger people, those with little or no land, and also with a few women. Often, Lundayeh from Indonesia come to stay with their relatives for several months in order to do such work. This is attractive because of the relative strength of the Malaysian currency.

In the preceding account, I outline the division of labour between men and women that occurs for rice cultivation. Although they do have different roles, both sexes are involved in all stages of its cultivation. However, rice cultivation as a whole is regarded as the responsibility of the women. The fields are referred to as the woman's, and it is she who makes decisions regarding how many types of rice to plant, when to harvest and so forth.

There are a large number of rice land-races planted in Long Mio and Long Pasia, although not as many as have been recorded in other highland communities in Borneo (Christensen, 1997: 31; Dove, 1985: 159-165; Janowski, 1987: 17; Sellato, 1997: 30). Typically, a family will plant at least two land-races in any one year, more commonly, four or five, and the most I recorded, was ten. I noted twenty-nine local names of land-races in total. These refer to both hill and wet rice, and include red and black rices, and glutinous types. The history of many of these varieties is known, and

is sometimes reflected in the names. For example, *fadey kelalan* originates from the village of Ba' Kelalan, and *fadey kelabit* comes from the Kelabit people. If people eat a particularly good type of rice, for example, when visiting another village, they will try to obtain seeds. This exchange of seed is undoubtedly part of a long tradition, and is not just confined to rice. People are always interested in experimenting with new crops or varieties, simply to try new foods or to improve yields or income. In the last couple of years, a few people have begun experimenting with high-yielding varieties of wet rice from the government. I talk about the expansion of wet rice cultivation in more detail at the end of this chapter.

2: 4: 1. Vegetable and fruit crops

As part of the hill rice system, various other crops are grown. At the time of sowing the rice, cucumbers and corn are sown, these crops growing alongside the rice plants. Mustard greens (*Brassica chinensis* and *B. juncea*) are also sown at the same time. These germinate and grow quickly, providing green leafy vegetables in a matter of weeks. The other crops then take over. The corn ripens in late October through to December, while the cucumber produces fruit at the time of the rice harvest. Prior to this, the young leaves are also collected as a vegetable.

One aspect of the agricultural system that has expanded greatly in recent years is the cultivation of vegetables. (A list of the vegetables grown is given in table 2.11.) Many of the crops are those that would have been familiar to people's grandparents, such as tobacco, corn, tomatoes, mustard greens, amaranth, squashes, loofah, beans, sweet potato, manioc and taro. However, there are also some new crops, such as carrots, potatoes and cabbages. Vegetables are often grown in small patches around people's field-houses, or on a larger scale, in vegetable fields, often created from rice fields after the rice has been harvested. (Plots of two vegetable fields are illustrated in figures 3.1 and 3.2 in the following chapter.)

Today, vegetable and tobacco fields are being expanded because of interest in market gardening. The vegetables are mostly grown for sale locally, particularly in the logging camps, as explained previously. Tobacco has been very successful (plate 2.15), as has the other main cash crop, coffee. Expansion of these crops has been

Table 2.11: Cultivated vegetables grown in Long Mio and Long Pasia

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME	ENGLISH NAME
Bawang merah	Alliaceae	*Allium cepa* L.	Red onions
Bawang putih	Alliaceae	*Allium sativum* L.	Garlic
Kusei	Alliaceae	*Allium* sp.	Chives
Kuru (sia & bata)	Amaranthaceae	*Amaranthus* spp.	Spinach / amaranth
Don sup	Apiaceae	*Apium* sp.	Celery
Ufa'	Araceae	*Colocasia esculenta* (L.) Schott.	Taro
Dinudur	Basellaceae	*Basella alba* L.	
Sayur busak	Brassicaceae	*Brassica chinensis* Willd.	Mustard greens
Sayur peit / sawi	Brassicaceae	*Brassica juncea* (L.) Czern.	Mustard greens
Sedai / abi'	Brassicaceae	*Brassica juncea* (L.) Czern.	Mustard greens
Sesei	Brassicaceae	*Brassica juncea* (L.) Czern.	Mustard greens
Kailan	Brassicaceae	*Brassica oleracea* L.	Chinese kale
Kobis	Brassicaceae	*Brassica oleracea* L.	Cabbage
Sayur picai	Brassicaceae	*Brassica rapa* L.	
Sayur putih	Brassicaceae	*Brassica rapa* L.	
Sayur gerinting	Brassicaceae	*Brassica* sp.	
Kangkong	Convolvulaceae	*Ipomoea aquatica* Forsk.	
Ubi waar	Convolvulaceae	*Ipomoea batatas* (L.) Lamk.	Sweet potato
Tadjak cina	Cucurbitaceae	Unknown species	Spaghetti gourd
Tadjak fadey	Cucurbitaceae	*Benincasa hispida* (Thunb. ex Murray) Cogn.	Wax gourd
Timon	Cucurbitaceae	*Cucumis sativus* L.	Cucumber
Timon abai	Cucurbitaceae	*Cucumis* sp.	
Timon belanda	Cucurbitaceae	*Cucumis* sp.	
Tabo	Cucurbitaceae	*Cucurbita* sp.	
Tadjak	Cucurbitaceae	*Cucurbita* sp.	Yellow pumpkin
Sifula / petolak	Cucurbitaceae	*Luffa acutangula* (L.) Roxb.	Angled loofah
Peria	Cucurbitaceae	*Momordica charantia* L.	Bitter gourd
Ubi kayu	Euphorbiaceae	*Manihot esculenta* Crantz	Cassava / manioc
Cangkok manis	Euphorbiaceae	*Sauropus androgynus* (L.) Merr.	
Kacang tanah	Fabaceae	*Arachis hypogaea* L.	Peanuts
Peritak boncis	Fabaceae	*Phaseolus vulgaris* L.	Green bean
Peritak lebping	Fabaceae	*Psophocarpus tetragonolobus* (L.) DC.	Winged bean
Peritak kadang	Fabaceae	*Vigna unguiculata* (L.) Walp.	Long bean
Delei kerokob	Gramineae	*Coix lachryma-jobi* L.	Job's tears
Tebpu	Gramineae	*Saccharum officinarum* L.	Sugarcane
Binamud	Gramineae	*Setaria italica* (L.) P.Beauv.	Millet
Delei	Gramineae	*Zea mays* L.	Corn or maize
Bawing	Lamiaceae	*Mentha* sp.	Mint
Kayu manis	Lauraceae	*Cinnamomum* sp.	Cinnamon
Gesimau	Poaceae	*Cymbopogon citratus* Stapf.	Lemongrass
Lada rayeh	Solanaceae	*Capsicum* sp.	Peppers
Lada	Solanaceae	*Capsicum* sp. (& varieties – white, green)	Chillies
Tomate	Solanaceae	*Lycopersicon esculentum* Miller	Tomato
Beliwan	Solanaceae	*Solanum americanum* Miller	Nightshade
Biterong	Solanaceae	*Solanum melongena* L.	Aubergine
Ubi gentang	Solanaceae	*Solanum tuberosum* L.	Potato
Lobak merah	Umbelliferae	*Daucus carota* L.	Carrots
Likua	Zingiberaceae	*Alpinia galanga* Willd.	
Kunus	Zingiberaceae	*Curcuma domestica* Valeton	Turmeric
Halia	Zingiberaceae	*Zingiber officinale* Roscoe	Ginger

encouraged by the government, which has been running several projects in the last few years, providing subsidies and guaranteed sale prices. However, those who do not own land are unable to establish coffee plantations, as people are only willing to loan land for the cultivation of annual crops.

Plate 2.15: Flowering tobacco plants, with swidden fields in the background

Another recent development has been an expansion of fruit cultivation. There is a long tradition of planting fruit trees, as is apparent from the presence today of fruit trees that were planted by people's grandparents, particularly at old field and village sites. The seeds or young seedlings are often collected for transplanting to a field or within the village. However, in recent years these activities have intensified. This has been prompted by logging in the area, leading people to collect seedlings because of a desire to save some of the forest resources and ensure their continued availability. Increasing numbers of people are also planting cultivated fruit species that were bought in the lowlands. This is being done with an eye on commercial production, as it is thought that fruit orchards could be profitable in the future. In table 2.12 I have listed those species that I saw being cultivated, distinguishing between those that are native to the area or naturalised, and those that are only found in cultivation.

Table 2.12: Cultivated fruit trees

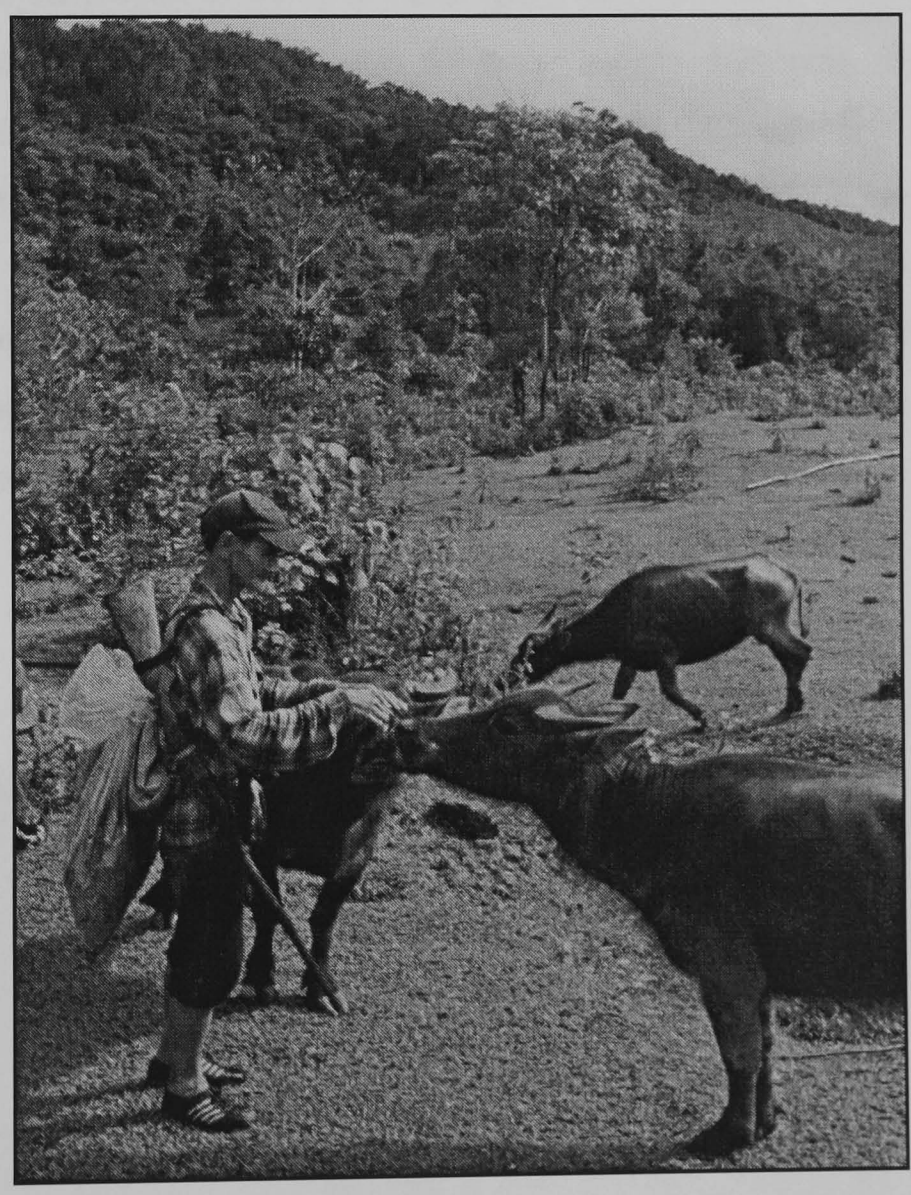
Key: C = only in cultivation; N = native to the area or naturalised;

LUNDAYEH NAME	Cult. / Native	FAMILY	SCIENTIFIC NAME	ENGLISH NAME
Belunu (Malay)	C	Anacardiaceae	*Mangifera caesia* Jack	Mango
Lam	C	Anacardiaceae	*Mangifera indica* L.	Mango
Felam	N	Anacardiaceae	*Mangifera* sp.	Mango
Karamut	N	Anacardiaceae	*Mangifera* sp.	Mango
Karung / Lam karung	N	Anacardiaceae	*Mangifera* sp.	Mango
Durian belanda (Malay)	C	Annonaceae	*Annona muricata* L.	Soursop
Nona (Malay)	C	Annonaceae	*Annona reticulata* L.	Custard apple
Piasau / Butan	C	Arecaceae	*Cocus nucifera* L.	Coconut
Beleleh	N	Bombacaceae	*Durio graveolens* Becc.	Durian
Dalit	N	Bombacaceae	*Durio* sp.	Durian
Lapun salat	C	Bombacaceae	*Durio* sp.	Durian
Lapun	C	Bombacaceae	*Durio zibethinus* Murray	Durian
Kaber	C	Bromeliaceae	*Ananas comosus* (L.) Merr.	Pineapple
Sesila'	C	Caricaceae	*Carica papaya* L.	Papaya
Pugi	N	Euphorbiaceae	*Baccaurea macrocarpa* (Miq.) Muell.Arg.	Tampoi
Fayang	C	Flacourtiaceae	*Pangium edule* Reinw.	Pangi
Talal	N	Lauraceae	*Litsea garciae* Vidal	
Lingat	N	Meliaceae	*Lansium domesticum* Correa	Langsat
Feriubi	N	Moraceae	*Artocarpus* cf. *primackiana* Kochummen	
Lagka	C	Moraceae	*Artocarpus heterophyllus* Lamk.	Jackfruit
Kiran / Tarap	N	Moraceae	*Artocarpus* sp.	
Bong	N	Musaceae	*Musa* sp.	Bananas
Jambu (Malay)	C	Myrtaceae	*Psidium guajava* L.	Guava
Jambu air (Malay)	C	Myrtaceae	*Syzigium samarangense* (Blume) Merr. & Perry; or *S. aqueum* (Burm.f.) Alston	Water apple
Markisa (Malay)	C	Passifloraceae	*Passiflora edulis* Sims	Granadilla / Passionfruit
Buyor	C, N	Rutaceae	*Citrus microcarpa* Bunge; *C. maxima* (Burm.) Merr.; *C. sinensis* (L.) Osbeck; *C. medica* L.	Citrus / Orange / Lemon
Sia	N	Sapindaceae	*Nephelium cuspidatum* Bl. var. *eriopetalum* (Miq.) Leenh.	Rambutan
Rambutan (Malay)	C	Sapindaceae	*Nephelium lappaceum* L.	Rambutan
Beritem	N	Sapindaceae	*Nephelium ramboutan-ake* (Labill.) Leenh.	Rambutan

2: 4: 2. Buffaloes and pigs

One aspect of the agricultural system that I have yet to mention is livestock. The most highly valued animals (not just in monetary terms) are buffaloes (plate 2.16), with pigs a close second. Buffaloes are seen as an investment, and are used as a measure of wealth. Most people, if they have money, would like to buy buffalo. This is in preference to keeping money in the bank, where, I was told by several people, it is too easy to spend. Thus, buffalo remain today, as they were in the past, an important form of wealth. They still often make up part of a girl's bride price (*purut*), although this is sometimes replaced by money. Sixteen families in Long Pasia and

Plate 2.16: A man feeding salt to his buffaloes



five in Long Mio own buffalo, totalling over 150 animals. Cows are owned by a few people, but these are not regarded in the same light as buffalo. Buffalo (or cows) are only slaughtered at times of feasts, such as weddings or Christian festivals, although more commonly, pigs are slaughtered. This is in part because buffalo are so large,

and so to justify killing one, it has to be a very large feast. Also, most people prefer to eat pork.

Pigs are kept by just nine families today, apparently far fewer than in the past. The reasons behind this are unclear, some people suggesting that it simply reflects a lack of interest. Chickens are kept by many families, although there has been a problem in the last couple of years with 'chicken rustling', and one family in Long Mio owns three goats.

2: 4: 3. Becoming *Lun Nan Ba*

In the past, the Lundayeh of the Ulu Padas grew only hill rice. Today the people of Long Mio and Long Pasia continue to grow mostly hill rice, but there is an increasing amount of wet rice being grown (plate 2.17). Cultivation of wet rice began here about forty years ago. In the late 1960s, there were reportedly 'nascent irrigated padi schemes' in these villages (Crain, 1973: 2). It was the Sabah government that first encouraged people to establish paddy fields. The uptake and expansion of wet rice cultivation was further facilitated by the change in people's way of life, with a shift to permanent settlements and a more sedentary way of life.

Plate 2.17: Planting wet rice

Today, the government continues to encourage wet rice cultivation. This is primarily through a system of subsidies, every acre of wet rice planted receiving a subsidy of 300RM annually. People are also keen to increase their yields, and this has led some people to begin experimenting with higher-yielding and fast-growing varieties (all wet rice varieties) which are being offered by the government. Another reason why people choose to cultivate wet rice is to diversify. Growing both wet and hill rice not only reduces the risk of crop failure, but also spreads the work load, since wet rice is planted later than hill rice. A shortage of land for hill rice cultivation near to the village is also beginning to influence people's choices, and this is likely to become a major issue in the future.

Some people are shifting away from hill rice cultivation altogether, because it is so labour intensive and physically demanding. There is also growing interest in cash-crops. It is now less important to be self-sufficient in rice, something that was a matter of some pride in the past. Today, it is recognised that some people choose to follow a different strategy. Those most interested in growing cash crops are the younger generation, in particular young single men (who wish to save up to get married, for example) and young couples (who are concerned with meeting the expense of bringing up children). Often the young men of a family spend all their effort producing cash crops, while their parents cultivate rice for family consumption. Some families with very young babies do not plant rice, or only a very small area, it being difficult for the mother to spend time in the fields. Instead the father concentrates on cash crop production. Two families in Long Mio and seven in Long Pasia were only intending to make small rice fields, or none at all, in the 2000 / 2001 agricultural year. In recent years, good coffee and tobacco crops have provided such families with more than enough cash with which to buy rice as well as meet other needs.

It has been suggested (Vaz, pers.comm.) that in perhaps ten years time, the cultivation of hill rice will have died out because of a lack of desire among the younger generation to follow such a physically demanding way of life. One important factor which is countering this trend is the desire to eat hill rice, which is considered far tastier than wet rice, and also the desire for the other crops grown alongside it – cucumber, corn, squashes and mustard greens. Rice cultivation is also

regarded as a much less risky enterprise than cash-crop production. I was often told that if your rice-barn is full, you at least know that your family will not go hungry. In addition, hill rice cultivation is still regarded as an important part of the Lundayeh way of life, and therefore, something that should be continued. As has been found elsewhere (Brush, 1992; Iskandar & Ellen, 1999), such cultural factors may act to maintain traditional agricultural practices.

CHAPTER 3: LUNDAYEH FOOD CHOICES AND RESOURCES.

3: 1. Introduction

A question that the people of Long Mio and Long Pasia often ask each other is *anun kikid muh*?, or 'what *kikid* do you have?' There is no direct translation of the word *kikid*. It refers to all the side-dishes, or 'relishes' (Dove, 1985: 159), that are served with rice, and so can include vegetables, fruits, chillies, noodles, meat, fish... Asking what people have to eat is often simply a way of teasing them. For example, when passing a house from which the sounds of cooking or eating can be heard, a passer-by may call out this question. If the response is 'boar', then they will often, jokingly, invite themselves in to eat. However, such enquiries also reflect a genuine interest in other people's food, and in particular, whether they have had any recent hunting success.

In this chapter I address this question for the people of Long Mio and Long Pasia, describing what kinds of food they have as *kikid* – the diversity of plant and animal species used, and their contribution to the diet. I also describe other aspects of the diet, namely, those foods eaten outside of formal meals, of which fruits make up a significant part. As well as investigating the diversity of foods that are used, I look at where these foods are harvested, describing the relative importance of different vegetation types.

This chapter then, is primarily descriptive, outlining the range of resources and habitats that the Lundayeh use for food. I also investigate some of the reasons underlying people's food choices, in particular, the links between food preferences, tradition and identity. The way of life and dietary patterns of the Lundayeh are changing, and so I explore some of the reasons for these changes and their consequences.

3: 2. Methodology

Data on food and diet are based on food diaries recorded by villagers. During five seven-day periods in each of the villages, I asked a member of every household to

record the foods being eaten within their household. To each household I gave a form to be completed (shown in appendix 2). This was in the Lundayeh language, and the following questions were asked:

- What foods were collected today? (name of animal, fish, vegetable, fruit;)
- How much was collected? (e.g. number of animals, kilos, bowls, bundles;)
- Where were these collected? (e.g. old growth forest, secondary forest, riverside, fields, shop;)
- Who collected these? (name of person)
- Which of these foods did you sell, what quantity and for what price?
- What foods did you eat today?

The decision was made to conduct surveys with the entire community for relatively short lengths of time, rather than with a small number of people for longer periods. The reason for this was that I anticipated considerable variation between households, something which has been noted in other studies (Christensen, pers.comm..; Colfer & Soedjito, 1996: 167), and which proved to be the case here. To investigate whether there was seasonal variation in people's diet, the surveys were conducted at roughly two-monthly intervals throughout the year.

The number of households for which forms were completed varied between 43 and 59 (out of a total of 68) in Long Pasia, and between 12 and 15 (out of a total of 15) in Long Mio. This represented an average of 73% and 91% of households in the respective villages. This variation in response was largely due to people travelling, and also because people sometimes forgot. In the latter case, I was usually able to ask people to recall the numbers of animals hunted and people's fishing activities.

During one of the survey periods I also asked some of the children to keep food diaries. I conducted this survey in the light of the observation made by other researchers (Campbell, 1987; Etkin, 1994: 5; de Garine, 1990; Pagezy, 1993) that children's diet often differs markedly from that of adults. The children who participated were those in the top two years of primary school (aged between 10 and 12 years). Younger children were felt not to have sufficient writing skills, and older children were absent from the village, going to school and living in town.

In addition, during the entire fieldwork period, I kept a food diary, recording all foods collected and eaten in the households where I was staying and which I observed being eaten elsewhere. Finally, to further investigate the sources from which foods were being collected, I undertook mapping exercises (described in chapter one).

3: 2: 1. Some problems with gathering food data

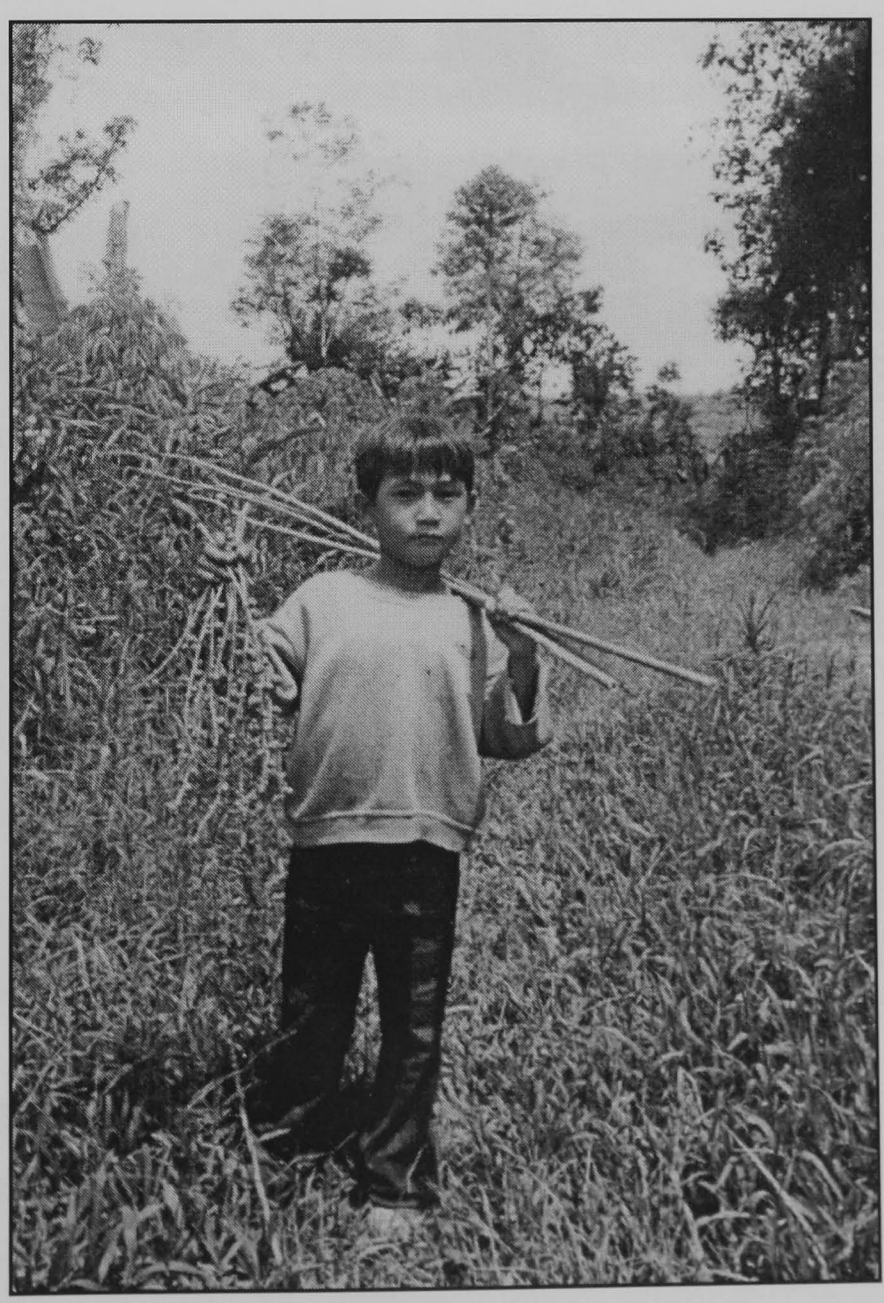
Before considering the results of the food surveys, I would like to highlight a few of the problems inherent in collecting these kinds of data, and a few problems particular to my situation. This will enable a better assessment of the validity of my data and conclusions, presented in the following sections.

Recording what people eat is notoriously difficult (Etkin, 1994: 5; Fleuret, 1979; Jerome et al., 1980; Johns & Kuhnlein, 1990; McArthur, 1977: 99; Strickland, 1986: 134; Ulijaszek & Strickland, 1993: 110). This is because of the need to reach a balance between not imposing too much of a burden on the people being studied, with that of gathering reliable and detailed information. For example, when doing dietary surveys, researchers can attempt to record everything themselves, either through visiting people at mealtimes, or through regular interviews. Such a process is not only time-consuming, but may be intrusive. Alternatively, the people who are the subject of the study can be asked to record their own diet, provided of course that they are literate. This was the approach that I took. There are also potential problems with this method, and I will briefly outline those that I encountered.

Although nearly everyone with whom I worked was willing to participate, inevitably people sometimes forgot to record their foods, and were then reliant on memory. In recalling their diet, I found that people often forgot to record vegetables that they had eaten. This is because there is little variation in these from day to day, and also because there are no obvious prompts to recall which vegetables were eaten. This is in contrast to meat, since a successful hunting trip is readily remembered. Furthermore, foods eaten outside of formal meal times were often forgotten. This was apparent from discrepancies between the food diaries and my own observations.

As well as the vagaries of memory, another important factor which I found influencing my results was the cultural value of particular foods. For example, great value is placed on having a variety of side-dishes to eat with a rice meal, and in particular, in having meat and fish to eat. Consequently, some people were embarrassed at having had just one or two side-dishes with their meals. I also became aware that people had a tendency to over-record meat and fish. This was partly because such foods were easier to remember, but also because of a feeling of embarrassment if the only foods eaten were vegetables. This became apparent when comparing household diaries, since the practice of sharing meat between a number of households made it possible to double check on the number of animals that had actually been hunted.

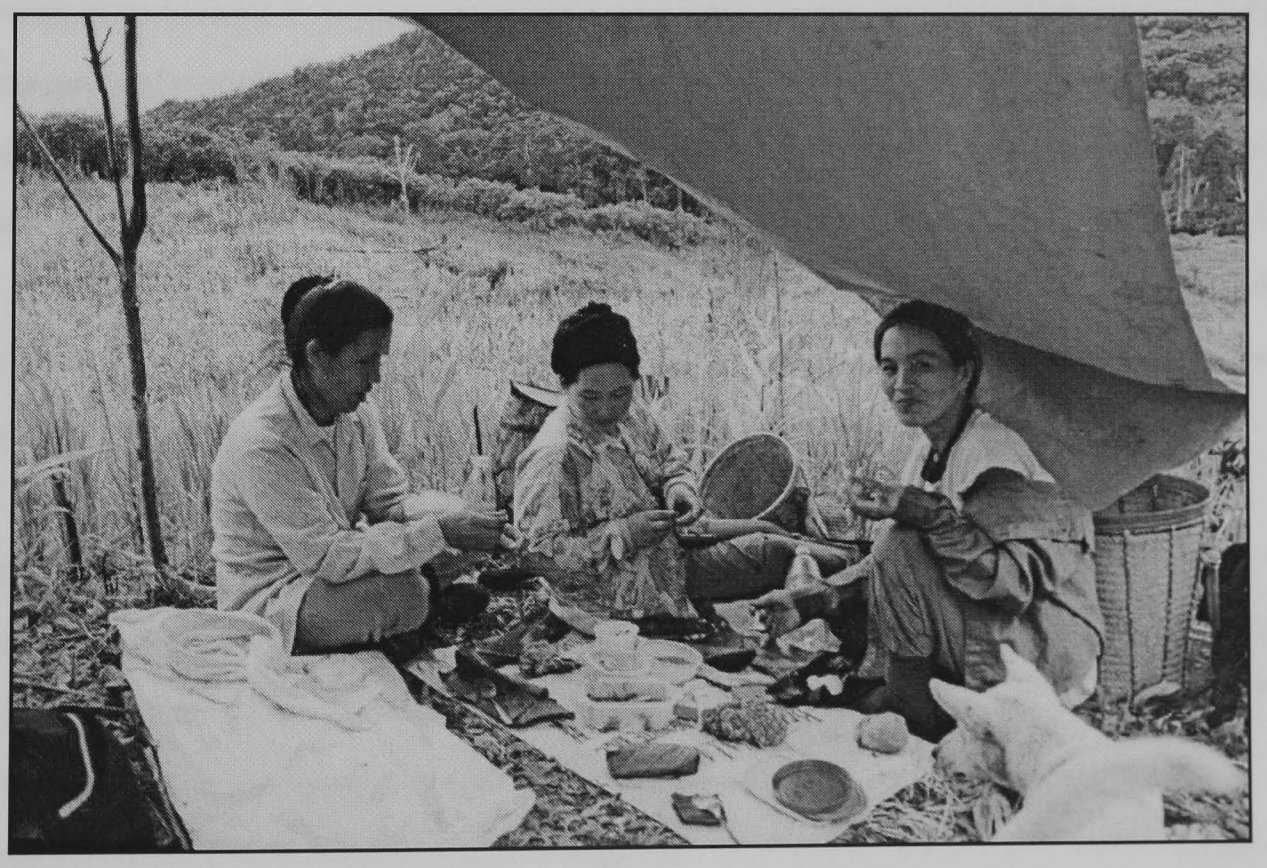
Plate 3.1: A boy returning home with bamboo poles (to make fishing rods) and the young fruits of *Baccaurea lanceolata* (*bua lipau*)



By contrast, foods that are eaten as snacks, such as cakes, biscuits and fruits, were largely under-recorded. It was of interest to find that the children recorded many more snack foods than did their parents (plate 3.1). This is in part because adults tended not to record such foods as they do not regard them as being of importance, a tendency also noted by other researchers (Colfer & Soedjito, 1996: 166; Etkin, 1994: 4). However, this difference is not just an artefact of recording, but also reflects a difference in diet. Children do eat many more snack foods, and certain foods are only eaten by children, as I describe later.

Foods eaten away from the household were also under-recorded. For example, when working in the fields for the day, people often gather a few extra vegetables to eat with their mid-day meal (plate 3.2). Such additions are all too easily forgotten, and rarely did they seem to be recorded in the survey forms. Furthermore, when people went on hunting trips, or stayed overnight in their field-houses, food diaries were

Plate 3.2: Eating lunch in the fields, including the fruit of *Etlingera elatior* (*bua salleh*), collected from the field margins



only occasionally kept. Therefore, my data reflect people's diet when they are in the village, but this is not always typical. For some people, when they are staying at their fields, they are able to eat a more varied diet because there is a greater diversity of

resources available. One reason for this is that there are fewer people and so there is lower harvesting pressure, particularly at the more distant field sites. Consequently, particular resources are more abundant. For example, upriver at Long Bayur where several families have land, there are many more fish than near Long Pasia. A second reason for the greater diversity of resources at these field sites is that typically a range of habitats is to be found close by. For example, as well as their fields, people have easy access to riverside vegetation, fallow fields and forest. In contrast, when staying in the village, many people do not have fields close by, and older secondary forest is only to be found some distance away.

In contrast to the more varied diet typical when people are at their field-houses, during hunting trips the diet usually consists entirely of meat. Because the entrails of an animal cannot be preserved by smoking and so deteriorate quickly, these are eaten while out in the forest. On one hunting trip in which I participated, we ate only boar liver and tripe with our rice for three days. Fish are also often caught on such trips, particularly if there has been no success at hunting. Rarely are vegetables gathered and eaten, as these are not found in abundance in old growth forest where the best hunting is to be had (a finding that I describe later in this chapter). Occasionally palm stems and fruits are collected. I was often told that if no animals have been caught, people will collect palm stems so that they have something to eat with their rice. When people had been on hunting trips I made an effort to talk with them and find out what they had caught, and so the numbers of animals hunted are reliable. However, plant foods collected and eaten during these trips are undoubtedly under-recorded (but these are not many, as I have just explained).

I have spent the last few paragraphs describing the shortcomings in my data, but these are informative in themselves. Thus, people's response to the dietary surveys highlighted the cultural values associated with particular foods. In spite of the problems that I have described, the data give a fairly accurate picture of the Lundayeh diet. I turn now to a more detailed consideration of these data, beginning with a description of the diet.

3: 3. The food of the Lundayeh

The Lundayeh refer to food as *luk kenen*, 'that which is eaten'. In common with perhaps all other swidden agriculturalists of Borneo (Chin, 1985; Christensen, 1997; Colfer et al., 1997; Dove, 1985; Janowski, 1995), the food of greatest importance is rice. When asking whether you have eaten yet, the Lundayeh ask whether you have eaten rice (*nekuman luba' ko?*). Only if you have done so are you considered to have eaten.

Eaten with the rice are *kikid* – these are the vegetables, meat or fruits eaten as side-dishes. Great value is placed on having a variety of *kikid* to accompany the rice, with ideally, a mix of vegetables, meat and fish. When guests are present, it is usual for the hosts to repeatedly apologise for not having any *kikid* to offer – even when there are plenty.

Also within the category *luk kenen* are those foods that are eaten as snacks, of which *bua* (fruits) and *kui* (cakes) make up the largest proportion. These foods, often accompanied by sweet drinks, help to sustain people while they are working in the fields. They are also an essential part of socialising, visitors being served such food and drinks when calling at someone's house.

These are the categories of food that I describe in the following sections. I also mention drinks, *luk rofen*, briefly. This is because they are also an important part of Lundayeh consumption practices, both with respect to nutrition and to the social aspects of diet. That local people recognise this was reflected in the responses to my questions concerning past eating practices, since these often prompted people to talk about the consumption of *borak*, rice wine. In the past, serving and drinking *borak* was an essential part of celebrations and in entertaining guests (Dove, 1988). I focus on this aspect in the section on changes in the diet.

3: 3: 1. Rice

Rice meals are eaten three times a day – first thing in the morning, mid-day and the evening (plate 3.3). Rice is cooked early in the morning, the women getting up before dawn to begin their housework. *Luba' laya'* (literally, soft rice) is the

Plate 3.3: A family at dinner

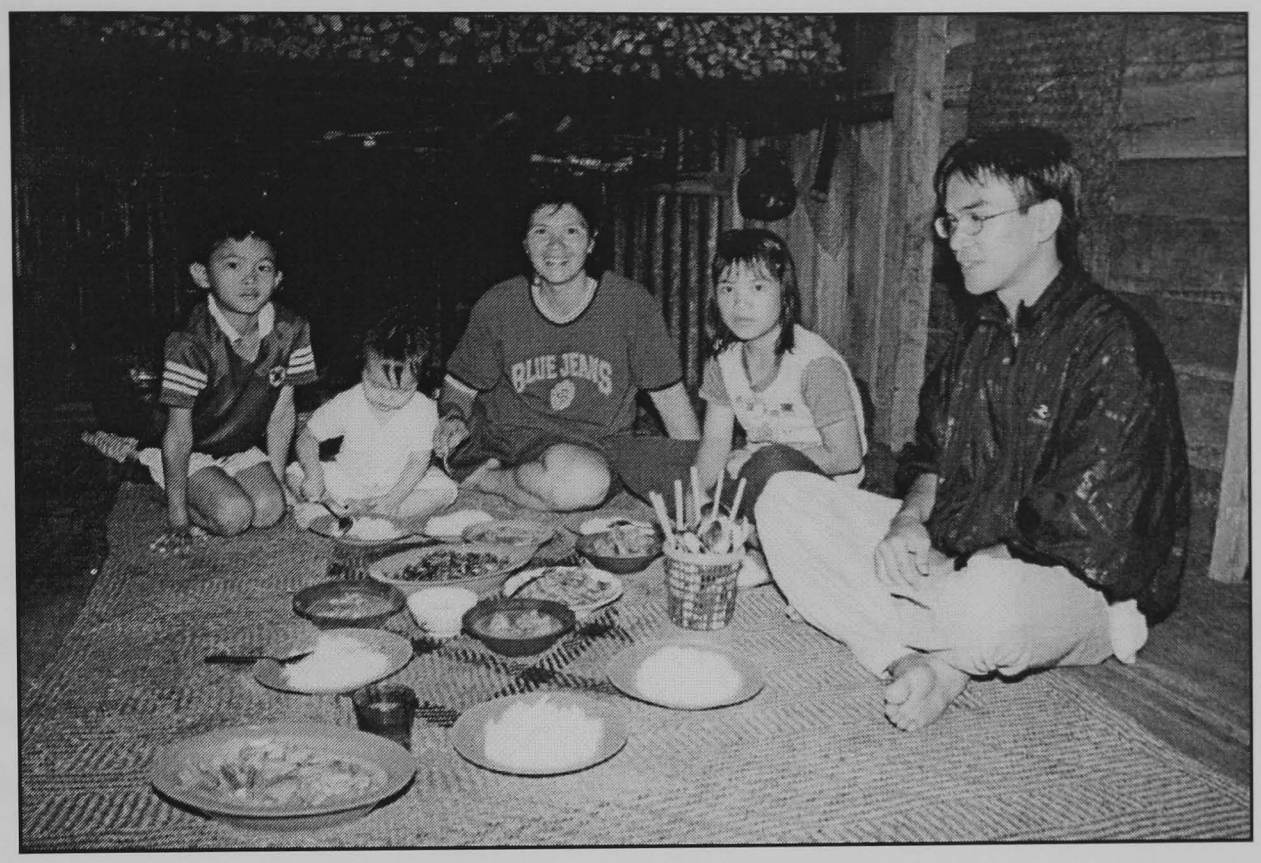
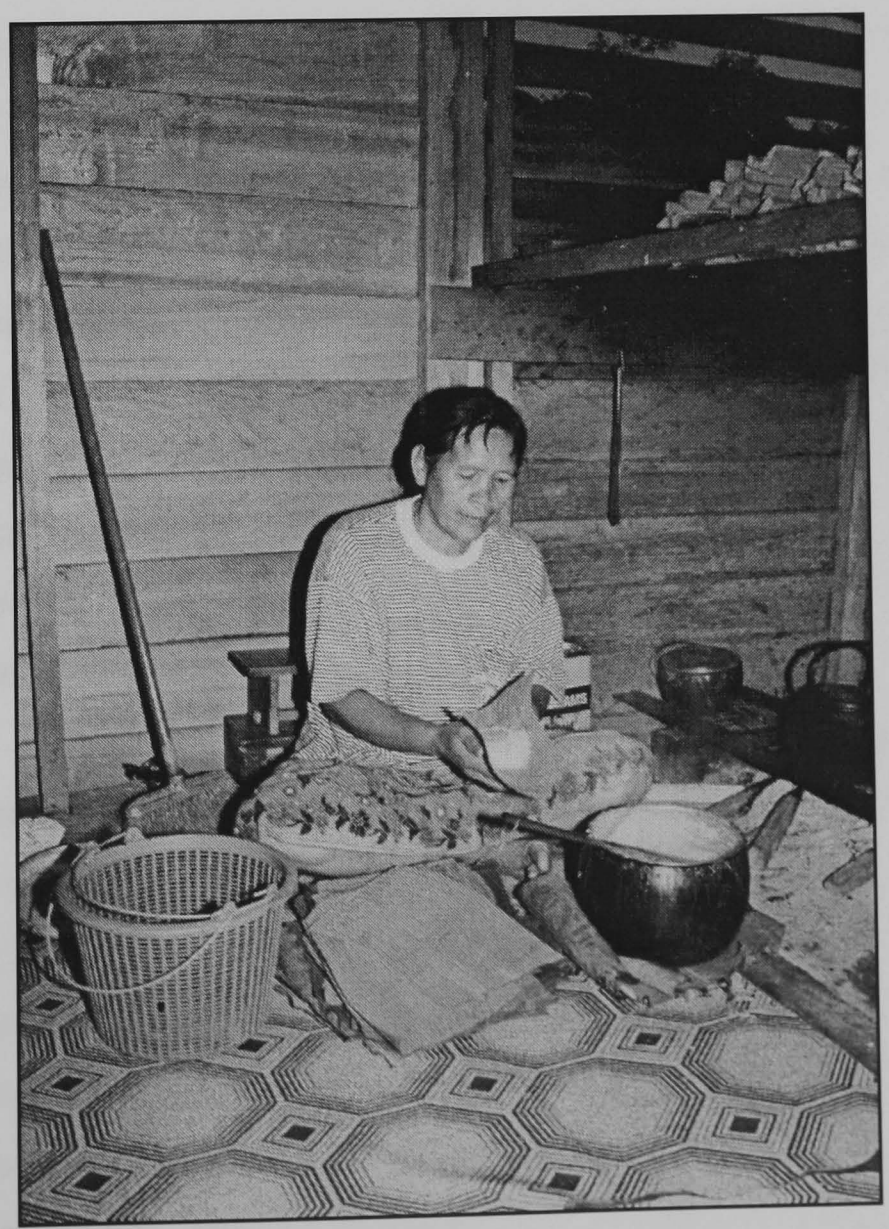


Plate 3.4: Making *luba' laya'*, wrapped in banana leaves



traditional way of cooking rice, and is preferred by most people. It is cooked with a lot of water so that when hot, it is porridge-like in consistency, although it becomes quite firm on cooling. It is also called *luba' tinga* (wrapped rice), because portions of the rice are wrapped in leaves, from which it is later eaten (plate 3.4). Nearly everyone cooks this rice, at least in the morning, as it can be stored to provide food throughout the day and is easily carried when travelling, whether to the fields or on longer trips. A second batch of rice is cooked in the evening. At this time of day *luba' urag* is usually cooked, because this takes less time to cook and prepare than *luba laya'*. *Luba' urag* is rice cooked with less water, so that it is loose grained rather than porridge-like in consistency. Most people, particularly the older generation, find this rice too dry for their taste. However, many of the young people, having lived away at school, now prefer to eat *luba' urag*, complaining that they get hungry too quickly if they eat *luba' laya'*.

Rice then, is the starch staple. Other starchy foods, such as cassava, sweet potato and corn, are eaten only as snacks (as I describe later). In the past, when rice harvests fell short, these foods were eaten as a substitute for rice, or they were mixed in with the rice to make it go further. Today, people are able to buy rice from town, and they would rather do this than go without rice. Sago (*nangeh*) from the palm *kinangan* (*Eugeissona utilis*), although known about (at least by the older generation), is never harvested. Most people told me that it used to be eaten by the Lundayeh in times of rice shortage or if people became lost in the forest and ran out of food. (This was also reported by Crain (1970c: 179) from his research with a Lundayeh community near Sipitang.) However, some denied that the Lundayeh have ever eaten this, saying that it is only a food of people such as the Penan (as indeed it is (Brosius, 1991; Puri, 1997; Sellato, 1994)).

Rice is also cooked as porridge – *abpa luba'* or *biter*. *Abpa luba'* (literally, 'rice water') is, as its name suggests, rice cooked with a lot of water, making a wet porridge. This is usually cooked for people who are ill or convalescing. It is also given to breast-feeding mothers, for whom it is said to be a good food for the production of milk. *Biter* is rice porridge that is flavoured in some way, and is eaten as *kikid*, i.e. as an accompaniment to rice. Most commonly, green leafy vegetables are used as flavourings, especially mustard greens (*Brassica* spp.), or sometimes

meat is used. Chicken or game birds are popular, and when a pig has been killed for a feast, *biter berek* ('pork porridge') is always made.

As well as being eaten as a staple and as *kikid*, rice is eaten as a snack. Most commonly, sticky rice varieties (*fadey mo*) are used, simply boiled and eaten plain, or the cooked rice may be mixed with oil or sugar, and sometimes made into cakes (*kui*), as I describe below.

3: 3: 2. What *kikid* do you have?

Kikid are a valued component of the rice meal. They make the meal appetising so that people eat more – something that is seen as a good thing both for yourself and for those eating with you. It is considered important to feel full (*mebor*) after a meal, and it is essential that guests are satisfied. Should someone say that they are still hungry, those providing the food will respond with much concern and will be sure to produce more food. Hosts who let their guests go away still feeling hungry are regarded with disdain, while those who provide ample and delicious foods are much praised.

The foods that are served as *kikid* are diverse. At their most basic, the *kikid* may be simply salt or chillies – this is only ever out of necessity rather than from choice, for example, when people on a hunting trip have found no game. More typically, a meal will include a few vegetables, and perhaps some meat or fish. Some starchy foods are served as *kikid*, for example, the rice porridge, *biter*, mentioned in the previous section, and instant noodles are popular. From my own food diary, I found that, on average, 3.2 dishes are served with the evening meal. As I have already stated, having a range of *kikid* to eat is seen as the ideal. For example, when someone was trying to explain to me the meaning of the word *merifut*, which translates as 'complete', the example used to illustrate this was that of a meal in which the side-dishes included a variety of vegetables, as well as fish and boar meat.

Appendix 3 shows the full range of foods that were recorded in the dietary surveys, as well as the few additional foods I observed being eaten at other times. This gives a more or less complete representation of the range of foods that are eaten.

I will begin by considering the plant resources used as *kikid*. These make up the vast majority of the *kikid* served, accounting for 68% in Long Mio and 63% in Long Pasia (by frequency) of those recorded in my food diary (the remainder of which are meat or fish).[7] In appendix 3 I have listed separately those species used as flavourings and spices, *ubud* (the inner stems of various monocotyledonous plants), mushrooms, and vegetables. Included within my category of 'vegetables' are green leafy vegetables, bamboo shoots, tuberous roots (of which there are only two, potatoes and carrots) as well as flowers, seeds and fruits (plates 3.5 & 3.6). Only one species is used for its edible flowers, the orchid *busak liling pelanuk* (*Bromheadia finlaysoniana*) (plate 3.7), and just two species are used for their edible seeds, *bua fayang* (*Pangium edule*) and *fatar* (*Parkia* sp.). A number of fruits are eaten as vegetables, such as papaya, pineapple, jackfruit, and more obviously, aubergines, tomatoes, beans, etc.

The flavourings include various species eaten raw, often mixed with salt and chillies, as an accompaniment to the rice and *kikid*. Some of the gingers (*Etlingera* spp., *Alpinia galanga*), and the fruits *bua gitah* (*Ficus racemosa*) and *bua lipau* (*Baccaurea lanceolata*) are eaten in this way. The fruits of the *Garcinia* species are used to flavour soups (plate 3.8), as are the leaves of *kicui* (*Eryngium foetidum*) and *bawing* (*Mentha* sp.). *Afa' fulung* (*Albertisia* sp.) is used as a flavour enhancer, in the same way as monosodium glutamate (MSG). The remaining species are most commonly used as cooking ingredients.

Apparent from the data is the wide range of plant resources used. The Lundayeh recognise 113 types of vegetable and *ubud*, 28 mushrooms and 22 flavourings. These correspond to a slightly smaller number of botanical species, since some of the names refer to varieties of the same species (for example, three varieties of *Brassica juncea* are distinguished). Identification to species level was not always possible, (for example, because of the absence of specimens or of fertile material for identification,) and so the number of species used cannot be given precisely. However, they represent at least 107 species of vegetable, 19 species of flavouring, and 10 mushroom species. This is certainly an under-estimate of the number of

[7] I used the data from my own food diary rather than from the dietary surveys, because of the tendency, previously noted, for people to exaggerate the amount of fish and meat being eaten.

Plate 3.5: Bamboo shoots of *Gigantochloa levis* (*pulu bulu betung*)

Plate 3.6: The mushroom *Amanita* sp. (*kulat alub*)

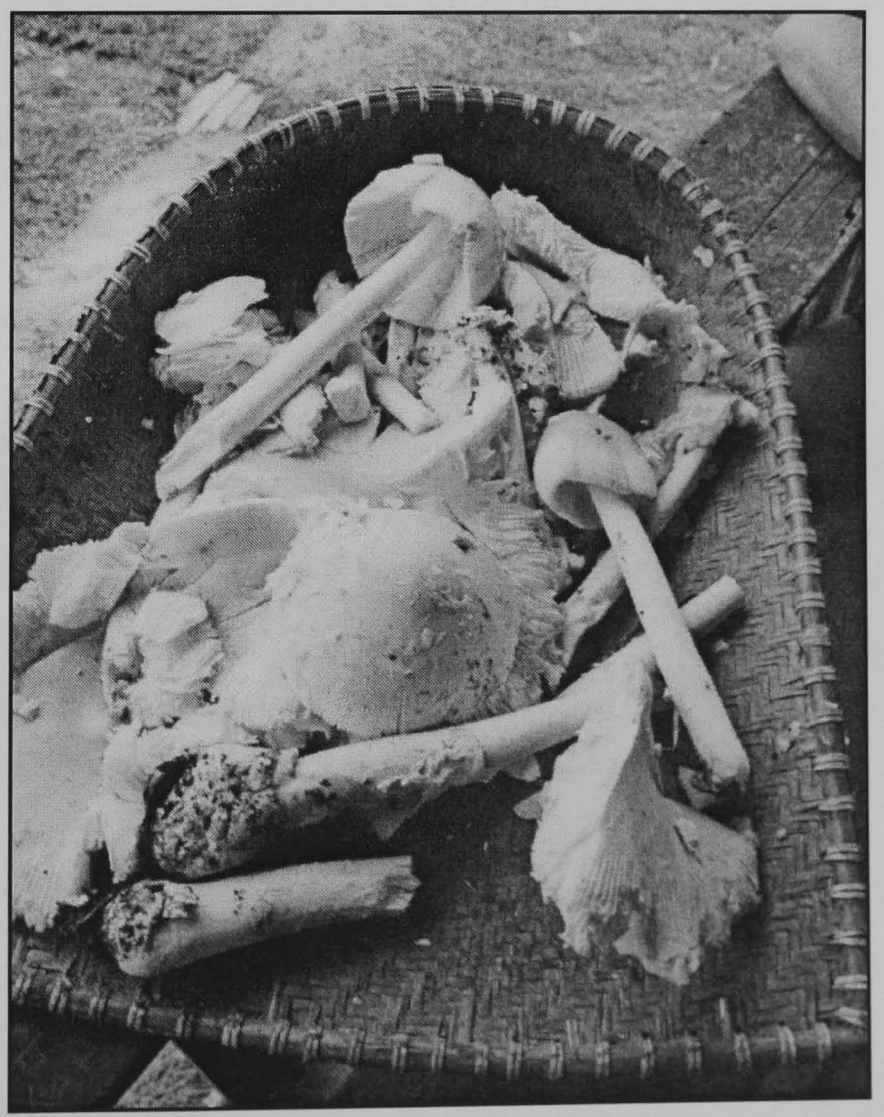


Plate 3.7: The edible orchid *Bromheadia finlaysoniana* (*busak liling pelanuk*)

Plate 3.8: Fruits of *Garcinia dryobalanoides* (*bua terur garang*), often used as a flavouring

edible mushroom species, since I was only able to gather specimens for 12 of the types of mushroom. (I was told of certain mushrooms only after they had been cooked or eaten, and so was not able to make specimens of these.)

Similar arrays of edible plant resources (both with respect to the number of species used, and the actual species) have been recorded for other central Borneo societies (Chin, 1985; Christensen, 1997; Colfer et al., 1997). Christensen (1997: 46) collected comparable data on the numbers of species being used by an Iban and a Kelabit community in Sarawak. These data are summarised in table 3.1. This suggests that the Lundayeh use slightly fewer edible resources than either the Iban or Kelabit communities (although it should be born in mind that my calculations of species numbers are conservative estimates). There are a number of possible reasons for this. An important difference is in the degree of isolation of these communities. Unlike the Iban and Kelabit communities, Long Pasia and Long Mio are accessible by road, and this is likely to have resulted in a shift away from the use of some local resources towards processed and shop-bought goods (a trend I discuss later in this chapter). Another factor may be the higher populations of Long Pasia and Long Mio, this perhaps contributing to greater pressure on resources. The Iban community in particular uses markedly more resources. Christensen suggests that this reflects the greater adventurousness of the Iban in their eating habits. Probably also significant is the greater variety of forest types found near this community, as is the fact that this community is situated in the lowlands so the vegetation is different.

Table 3.1: Comparison of edible plant resources used as *kikid* by peoples of highland Borneo

NO. OF SPECIES:	KELABIT (PA DALIH) (Christensen, 1997)	IBAN (NANGA SUMPA) (Christensen, 1997)	LUNDAYEH (LONG PASIA & LONG MIO)
MUSHROOMS	38	19	10
VEGETABLES	117	190	108
SPICES OR FLAVOURINGS	34	61	19
TOTAL	189	270	137

In addition to looking at the range of food resources used, it is also informative to consider their relative importance in the diet. Although many species are edible, a

large number of these are rarely eaten. I have given some indication of the relative importance of the various plant foods eaten as *kikid* (excluding those used as flavourings) in appendix 4. I have ranked these according to the frequency with which they were recorded in the food diaries, ranging from 1 (those foods most frequently eaten) to 5 (foods rarely eaten).

The vegetables that are most commonly eaten are cassava leaves (*don ubi*, *Manihot esculenta*) (plate 3.9), fern tips (*pau abpa*, *Diplazium esculentum*), cucumber leaves or fruits (*timon, Cucumis sativus*) and mustard greens (*sedai*, *sesei*, and *sayur peit*, *Brassica juncea*). These vegetables were also reported to be among the six most commonly eaten in a Kenyah community, together with 'mushrooms' and *ubud* (Chin, 1985: 92). The reason for the predominance of these vegetables in the diet is that they are all abundant and easily accessible, growing either in fields, riversides or young fallow vegetation. Furthermore, cassava and this particular fern species are available all year round.

Plate 3.9: Preparing the leaves of *Manihot esculenta* (*don ubi*) by pounding in a pestle and mortar

A large number of species only make a relatively small contribution to the diet. This is for various reasons. For example, *sikarok* (*Schismatoglottis* sp.), which grows in streams in secondary or old growth forest, is not found near either of the villages.

Keduang (*Pseuderanthemum acuminatissimum*) and *feciruk* (*Helmintostachys zeylanica*) do not grow in abundance, and so these also are rarely eaten. *Bua fayang* (*Pangium edule*) involves a lot of work to detoxify the fruits so that they can be eaten. Other vegetables are not particularly tasty, and much better alternatives are readily available. For example, I never observed people eating *wei tei' lal (Ceratolobus concolor)*, *wei kurad (Daemonorops didymophylla)*, *wei ser (Korthalsia ferox)*, nor *siluk fulung* (*Costus* spp.). Although the *ubud* of all these species is edible, they are bitter or sour tasting, and so are rarely eaten. A contributory factor accounting for the limited use of certain resources, and one that seems likely to become increasingly significant in future years, is a lack of awareness of the edibility of certain resources. For example, many people were unaware that *wei ser* and *wei kurad* could be eaten. I return to the issue of loss of knowledge about edible resources at the end of this chapter.

So far, I have only talked about plant resources, but meat and fish are also an important part of the diet. People have a strong preference for eating meat in particular. When no-one has had any recent hunting success, it is common to hear complaints from people about how bored they are with eating 'just leaves' (*don mo*). The importance of meat and fish in the diet is apparent from the figures showing the percentage of meals in which these are eaten. Thus, in Long Pasia, 49% of meals included hunted meat or fish from the rivers, or if we include meat and fish that has been reared or shop purchased, the figure rises to 64% of meals. The equivalent figures for Long Mio are 42% and 58% respectively.

In terms of numbers of side-dishes, meat and fish account for 32% in Long Mio and 37% in Long Pasia, these figures also including shop-bought meat and livestock. By comparison with data reported from other central Borneo communities, this figure is low. For example, in a Kenyah community, 49% of the side-dishes of three individuals were of hunted meat or local river fish (Chin, 1985: 90-91). The same figures for four members of a Kantu' community were 43% for hunted meat and river fish, and 45% when including shop-bought meat or livestock (Colfer & Soedjito, 1996: 176 & 180-181). Although care needs to be taken not to infer too much from this, the data used for comparison being from relatively small survey numbers, it does suggest that less meat and fish is being eaten in Long Mio and Long

Pasia than might be expected. This is perhaps not surprising given the decline in animal and fish numbers that local people have noted in recent years. As I describe later in this chapter, there is some evidence to suggest that fewer animals are hunted in Long Pasia today than seven years previously.

I have indicated in table 3.2 the frequency with which various types of animal foods are eaten (ranked according to the frequency with which they were recorded in the food diaries).

Table 3.2: Frequency of animal foods in the diet

Ranks were assigned according to the number of times foods were recorded in the food diaries:
1 = >500 records; 2 = 300-499; 3 = 100-299; 4 = 0-99;

TYPE OF ANIMAL FOOD	RANK
Hunted meat	1
Local river fish	1
Livestock	2
Eggs (chicken)	2
Forest birds	3
Shop-bought fish	3
Shop-bought meat	3
Snails	3
Eggs (forest birds)	4
Eggs (snake)	4
Insects	4

As I described above with respect to vegetables, the contribution of various foods to the diet reflects a number of factors, such as abundance, ease of harvesting, and both cultural and personal preferences. For example, few people seek out insect foods because there are not many people, at least among the younger generation, who like to eat these. Also significant is that the collection of many of these insects involves considerable work. This is true of the sago grub, *wet bulu*. This insect is most commonly found in bamboo shoots, these growing seasonally. Each shoot only contains one grub, and it is difficult to detect in which shoots the grubs are to be found. On one collecting expedition, we succeeded in collecting just four grubs in one hour.

The collection of snails also involves a lot of work – typically, a couple of hours are needed to harvest sufficient for a bowl of *kikid*. In spite of this, they are quite

common in the diet because many people love to eat them. Furthermore, their collection is not seen as something arduous, but an enjoyable and relaxing way to spend a few hours, since women (who are the ones who collect snails) will usually go collecting with their friends. That they are not eaten more often is because of seasonal variation in their availability, as I describe later.

Many animal foods are not sought after, but are much appreciated if found. For example, birds eggs are collected if a nest is encountered. Snake eggs are regarded as a great delicacy, but people do not go out of their way to look for snakes, and those with eggs are rarely found. Similarly, forest birds are only occasionally eaten. Although snares are set around field margins, the prime purpose of these is to reduce crop damage, rather than to catch birds as a source of meat – although this is an added bonus.

Hunted meat, and fish from the local rivers, are the most important sources of protein in the diet. However, with declining hunting and fishing returns, people are increasingly turning to shop-bought and processed foods. Such foods accounted for 4% and 7% of *kikid* recorded in the dietary surveys in Long Mio and Long Pasia respectively. I should explain the appearance of army rations in the list of these foods. Just one mile from Long Pasia there is an army post, and the villagers regularly trade local goods, such as bananas and vegetables, for the rations. Tinned meat and fish, salted fish, and chicken eggs, are the main foods that people buy from the village stores, and the usual reason for buying these is because people have no fresh meat in the house. For the same reasons, the consumption of chicken and tilapia (from fish ponds) is increasing. Of the domesticated animals, only chickens are eaten as *kikid* on an everyday basis. The other animals, pig, buffalo and cow, are only slaughtered for special occasions. It is to such events that I now turn.

3: 3: 3. Killing a pig

Among the Lundayeh, the food served on special occasions is very different from that eaten every day. For such occasions it is considered essential to slaughter a domestic animal, a practice common among central Borneo peoples (Chin, 1985; Dove, 1985; Janowski, 1993; Rousseau, 1990).

The Lundayeh hold *irau*, which roughly translates as 'feast', for weddings, Christmas, New Year, funerals, to honour an elderly person, and at harvest time (plate 3.10). The animal slaughtered at such events is most commonly a pig (plate 3.11), but it may also be a buffalo, cow (rarely) or chickens (for smaller events). Typically only meat is served (together with rice), cooked as soup, *biter* (rice porridge) and sometimes fried. Additional dishes are regarded as optional, and may be served if there is enough time for preparation. Such dishes are made from cultivated vegetables, such as cabbage or *sayur peit* (*Brassica juncea*).

Thus, there is a clear distinction between festival food and everyday fare, it not being acceptable to serve forest foods (game or non-cultivated plant resources) for *irau*. The reasons for this could not be clearly put into words for me. In part it is to do with the view that serving forest foods would be regarded as mean. For example, in the case of a wedding, it is felt that a family should spend money on their daughter in this way, and to entertain their new in-laws and all the guests. The rest is based on tradition – it is what should be done, and has always been done. Having emphasised tradition, there are of course changes. In the past, *irau* would not have been conducted when someone died, as they are today. This recent change was explained to me as due to the fact that today, many people will travel a long way to attend a funeral, something that was not feasible in the past. Therefore, people wish to serve these guests with food. Serving vegetables, as well as meat, is also a fairly recent innovation. The other major change, considered in more detail below, is that people no longer serve *borak* (rice wine) at these occasions. Instead, hot drinks are served, along with biscuits.

3: 3: 4. Snack foods

Snack foods include cakes and biscuits, fruits, instant noodles, bread, sweets and crisps (table 3.3). These are often eaten together with hot drinks. Before every meal, when resting from work, and when visiting other people, drinks are served – tea, coffee, hot chocolate, or *abpa susu* (condensed milk mixed with water). These drinks are usually very sweet, and so make an important contribution in terms of calories to everyone's diet. Most commonly, biscuits are served with drinks, and increasingly,

Plate 3.10: Long Pasia's Christmas *irau*

Plate 3.11: Killing a pig for an *irau*

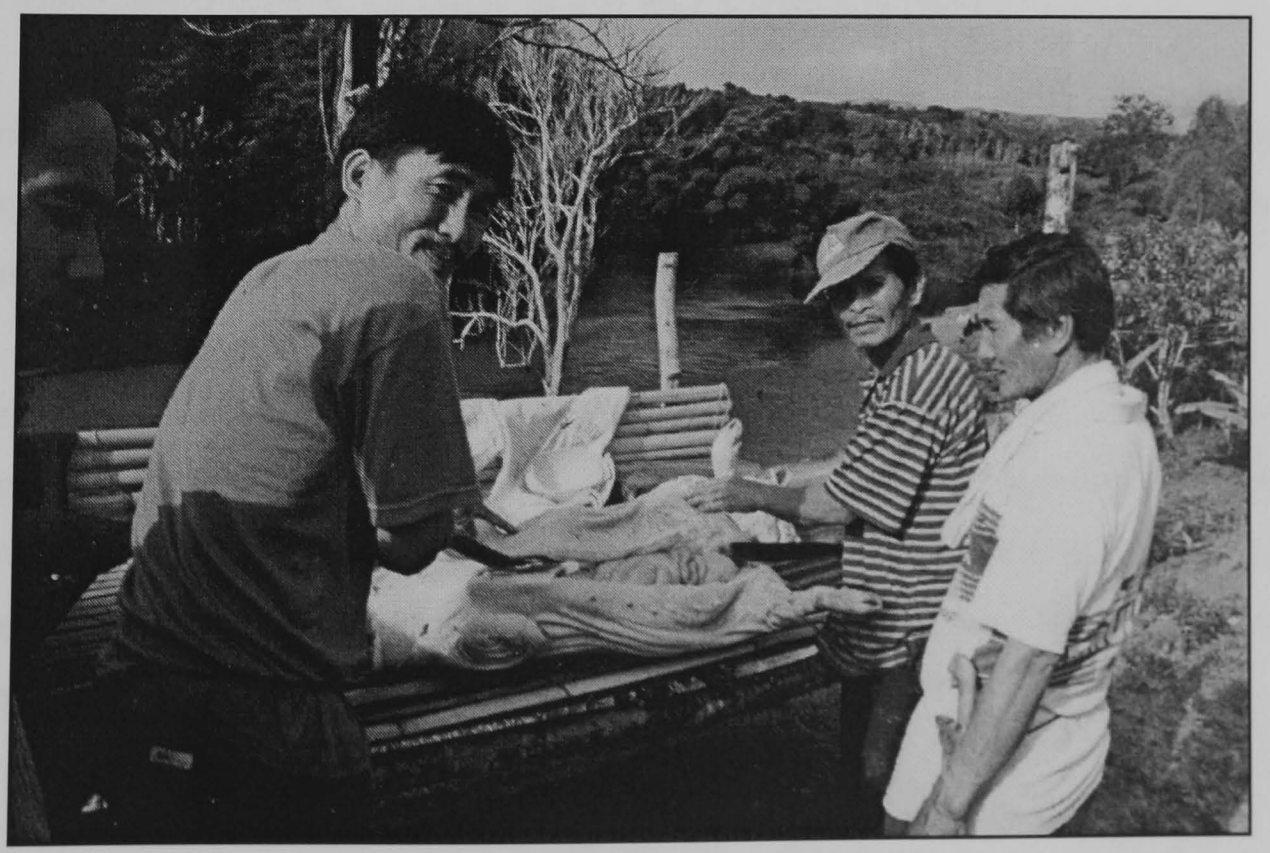


Table 3.3: Snack foods

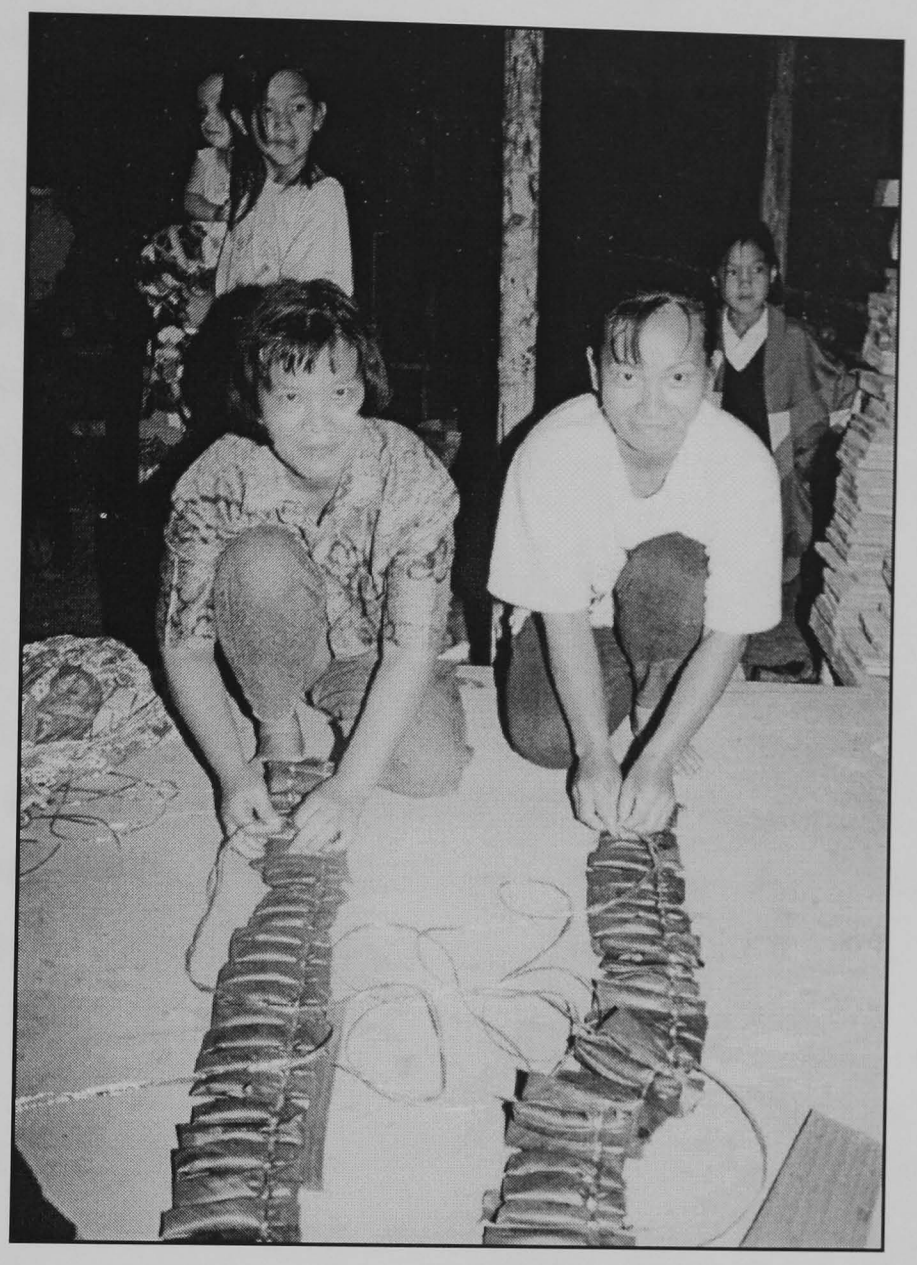
SNACK FOODS – MAIN CATEGORIES	TYPES
Army rations	biscuits; jam; fruit in syrup;
Bread	
Cakes & biscuits – shop-bought	
Cakes (*kui*; *noney*; *pinaram*) – home-made	banana; cassava; corn; jackfruit; pumpkin;
Crisps	
Fruit – local	various species (see appendix 5)
Fruit – shop-bought	apples; durian; oranges; rambutan; watermelon;
Instant noodles	
Peanuts (*kacang tana'*)	
Porridge (*bubur*) (*delei; kacang; ubi; ufa;*)	corn; beans; cassava; taro;
Spreads (for bread & biscuits)	condensed milk; honey; jam; margarine; peanut butter;
Sticky rice (*fadey mo*)	
Sugar	
Sugar cane (*tebpu*)	
Sunflower seeds	
Sweets	
Young shoots (*periku*)	various species (see table 3.4)

these are shop-bought. However, for a special occasion such as a birthday, for guests from outside the village, or at times when there is a lull in agricultural work, people also make cakes (*kui*). These include *noney*, made from sticky rice or corn roasted inside bamboo, and *pinaram* or *tinafey*, sticky rice wrapped in leaves and steamed (plate 3.12). Sometimes the rice is first mixed with oil and sugar, or occasionally coconut. For more special occasions, such as weddings, *luba' rinagas* may be made, for which rice is cooked with boar fat and then wrapped in leaves.

Porridge (*bubur*) is a popular snack food, often being cooked by groups of young people who get together in the evening. This is made from taro, cassava, beans or corn, mixed with coconut milk and sugar.

Many snack foods are eaten while people are out in the fields or forest. When a group is working in someone's field, the owner of that field always provides coffee and tea, together with cakes of some kind. Often, fried doughnuts (*kui tepong*, 'flour cakes') are cooked, or during the months of November and December, when the corn is ripe, fried corn cakes are popular.

Plate 3.12: Preparing *pinaram*. These rice cakes are being tied together before steaming



People often eat cucumbers to refresh themselves while harvesting the rice fields (the season when these fruits are ripe). Sugar cane and the young shoots of certain trees, *periku*, which have a high water content and are astringent to the taste, also provide a ready source of refreshment (table 3.4).

Table 3.4: Species used as *periku*

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Kayu telatang	Anacardiaceae	*Campnosperma auriculatum* (Bl.) Hook.f.
Periku bata	Urticaceae	*Oreocnide trinervis* (Wedd.) Miq.
Periku pelanuk / Periku abai	Myrsinaceae	*Ardisia* sp.
Periku tuer	Euphorbiaceae	*Bischofia javanica* Bl.
Tebpu barok	Begoniaceae	*Begonia* sp.
War ilang	Myrsinaceae	*Embelia* sp.

The most important snack foods are fruits (plates 3.13 & 3.14) – important both because they are the most frequently consumed, and because of their nutritional value (Hladik et al., 1993). In appendix 5 I have listed the edible fruits found locally, indicating their relative importance in the diet. This ranking is based on my own observations, rather than on any quantitative data on frequency of consumption, because fruits were only sporadically recorded in the dietary survey. Not included in the table are those fruits that are sometimes bought in town. Most commonly, people buy those fruits grown in the Sipitang area, such as rambutan, durian, mango and watermelon. Occasionally, other fruits are bought, such as grapes, apples and oranges.

109 Lundayeh names of fruits were recorded, these corresponding to at least 89 species, (a conservative estimate, because not all were identified to species). As with the *kikid* (see section 3: 3: 2), in comparison with the data collected by Christensen (1997: 35 & 40) this is a lower number of species. The Kelabit community of Pa Dalih were reported to use 119 species, and the Iban community of Nanga Sumpa, 183 species of fruit.

The fruits most frequently eaten in Long Pasia and Long Mio are listed in table 3.5. These species are commonly eaten because they are found in the villages or very close by, and because they are always abundant. Bananas, as well as growing in the villages, are common in young secondary vegetation and in the riverside vegetation. Citrus trees predominate in the buffalo fields adjacent to Long Pasia.

Table 3.5: Most commonly eaten fruits

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Bua lam	Anacardiaceae	*Mangifera indica* L.
Bua sesila'	Caricaceae	*Carica papaya* L.
Bua lagka	Moraceae	*Artocarpus heterophyllus* Lamk.
Bua bong	Musaceae	*Musa* sp.
Bua jambu	Myrtaceae	*Psidium guajava* L.
Bua buyor	Rutaceae	*Citrus* spp.

Less commonly eaten, those ranked as two in appendix 5, include species with highly valued fruits which are not very common in the forest, for example, *bua beleleh*

Plate 3.13: Fruits of *Litsea garciae* (*bua talal*)

Plate 3.14: Fruits of *Artocarpus* cf. *primackiana* (*bua feriubi*)

(*Durio graveolens*) and *beritem* (*Nephelium ramboutan-ake*). *Bua bisian* (*Salacca vermicularis*) are also much favoured, but are rarely abundant as they are also a favourite food of mice and porcupines.

Fruits ranked as three include some that are popular, but are rarely encountered. Examples of such fruits are *bua berangan* (*Castanopsis costata*), which is not common near the villages, and rambutan (*Nephelium lappaceum*), with which people have had only limited success in cultivating. This category also includes fruits that are not highly valued, and so people do not actively look for them. However, they may eat these fruits if they come across them. Also found in this category are popular snack fruits of children. Those fruits ranked as four include species that are not very tasty, such as *bua rengeh* (*Semecarpus bunburyanus*) which apparently produces a rash in some people, as well as many species that are only eaten by children. Those fruits ranked as five I never observed being eaten, and few people knew that they were edible.

Fruits, as well as other snack foods, are particularly important in children's diet. This was apparent from the data collected in the children's food diaries. As well as a much higher incidence of snack foods, children also recorded a greater diversity. For example, they recorded sweets, sunflower seeds and crisps, as well as fruits that were absent from the adult food diaries, including *bua bidang* (*Rubus rosifolius*) and *bua buau* (*Syzigium foxworthianum*). These two fruits are typical of those eaten predominantly by children. They are small, sweet, and are found near the village, *bua bidang* growing in the surrounding buffalo fields and *bua buau* along the riverbanks where the children go to play and fish. Children snack on a wide range of fruits. Those most commonly eaten are listed in table 3.6. Characteristics shared by these species are that they are easily accessible, easy to harvest, and have fruits that require little or no preparation before eating.

Adults are generally more discerning in their choice of fruits, preferring the larger and sweeter fruits, most of which are from cultivated varieties. However, there are certain forest fruits that adults will go out of their way for, such as the fruits of species of *Durio*, *Nephelium* and *Mangifera*.

Table 3.6: Fruits most commonly eaten by children

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Bisian	Arecaceae	*Salacca vermicularis* Becc.
Kecii / Kayu mein / Tutuberu	Clusiaceae	*Garcinia parvifolia* (Miq.) Miq.
Timon labo	Cucurbitaceae	*Mukia javanica* (Miq.) C.Jeffrey
Iti / Eki'	Elaeagnaceae	*Elaeagnus ferruginea* Rich.
Lipau	Euphorbiaceae	*Baccaurea lanceolata* (Miq.) Muell.Arg.
Tuer	Euphorbiaceae	*Bischofia javanica* Bl.
Sikali	Melastomaceae	*Melastoma malabathricum* L.
Terur suit	Meliaceae	*Aglaia korthalsii* Miq.
Fika labo / Mata lawid	Meliaceae	*Aglaia odoratissima* Bl.
Lingat	Meliaceae	*Lansium domesticum* Correa
Gitah	Moraceae	*Ficus racemosa* L. var. *elongata* (King) Barrett
Bong	Musaceae	*Musa* sp.
Lipet	Myrtaceae	*Decaspermum parviflorum* (Lam.) A.J.Scott
Jambu (Malay)	Myrtaceae	*Psidium guajava* L.
Buau	Myrtaceae	*Syzigium foxworthianum* (Ridl.) Merr. & Perry
Jambu air (Malay)	Myrtaceae	*Syzigium samarangense* (Blume) Merr. & Perry; or *S. aqueum* (Burm.f.) Alston
Markisa (Malay)	Passifloraceae	*Passiflora edulis* Sims
Pisang lalid	Rosaceae	*Rubus benguetensis* Elmer
Serinit / Tabpa serinit	Rosaceae	*Rubus moluccanus* L.
Bidang	Rosaceae	*Rubus rosifolius* J.E.Smith
Buyor	Rutaceae	*Citrus microcarpa* Bunge; *C. maxima* (Burm.) Merr.; *C. sinensis* (L.) Osbeck; *C. medica* L.
Teladan	Zingiberaceae	*Hornstedtia affinis* Ridl.
Terebak	Zingiberaceae	*Alpinia* spp.

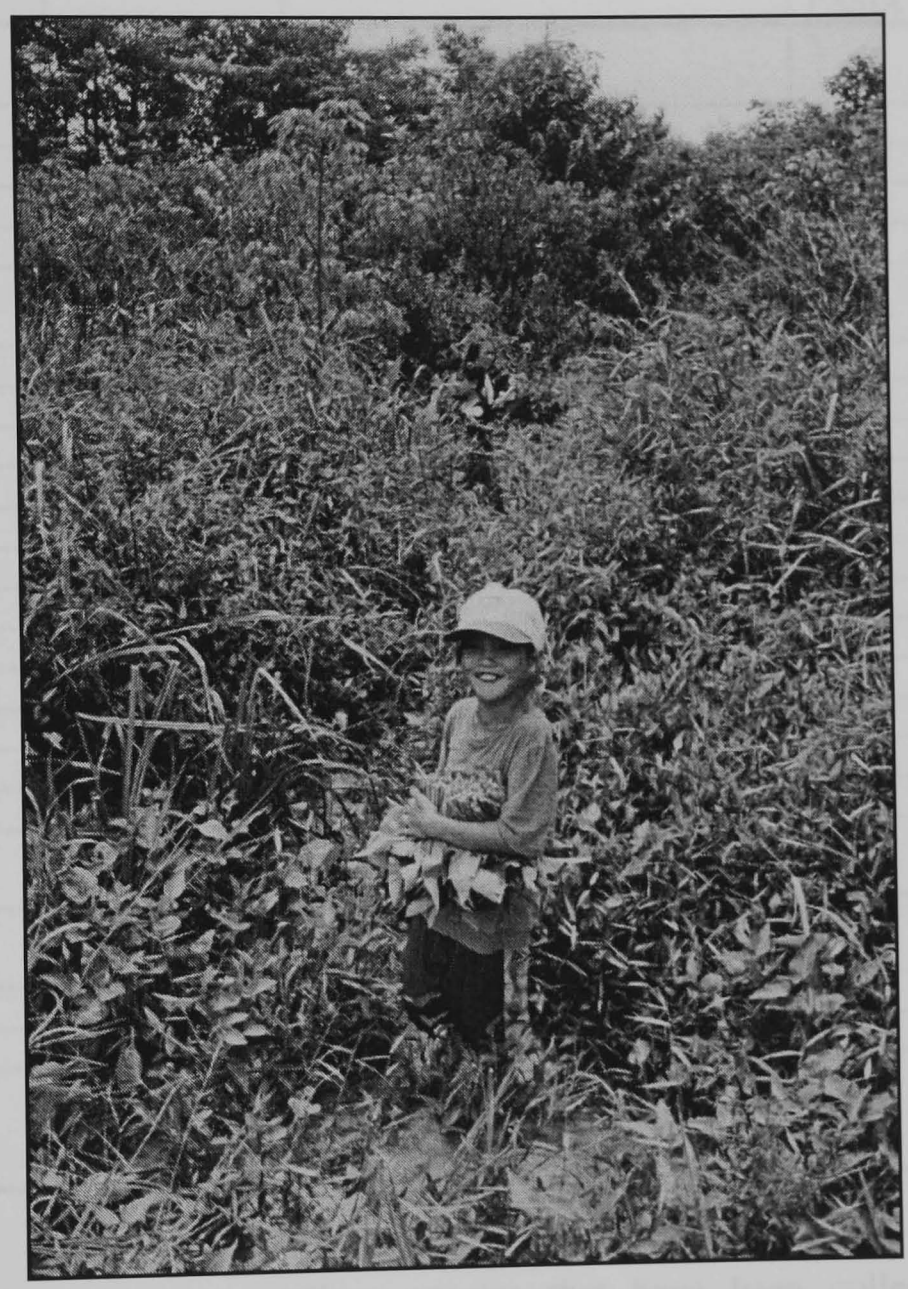
3: 4. Gardening, gathering, fishing, hunting and shopping

The foods of the Lundayeh come from a variety of sources – within the villages and their fields, fallow vegetation, riverbanks, and old-growth forest. Other food resources are from further afield, bought in Sipitang's market and shops. The relative importance of these various sources of food reflects people's patterns of resource use.

When asked where they had gathered particular foods, people typically said that they were from the *lati* (swidden fields), *kebun* (fields for vegetables or other crops, such as fruit trees or coffee), or *fulung* (forest). Sometimes, further detail was given. For example, people sometimes distinguished *iring lati* or *iring kebun* (field edge), or *iring ba* (edge of paddy field) (plate 3.15). Included within the category of forest were a variety of vegetation types, such as *fayeh* (heath forest), *amog* (secondary

forest), *fulung karar* (old-growth forest), and sometimes, *iring abpa* (the riverside). In this section, I will describe these different vegetation types, highlighting the main resources that are harvested from each of them.

Plate 3.15: Children collecting the leaves of *Ipomoea aquatica* (*kangkong*) from the margins of a wet rice field



3: 4: 1. Sources of foods

Let us begin nearest to home, so to speak, with the village and house area. The village area is quite intensively managed, there being a general desire for a tidy and beautiful village. Thus, there are regular efforts to cut the grass and most people grow ornamental plants around their houses. Every house also has a few fruit trees

near by, and some people have a small area for cultivating other plants. Table 3.7 lists the fruit species recorded in the two villages.

Table 3.7: Fruit trees found in Long Mio and Long Pasia
(* indicates those species collected from the forest)

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME	LONG PASIA	LONG MIO
Durian belanda	Annonaceae	*Annona muricata* L.	Y	
Nona	Annonaceae	*Annona reticulata* L.	Y	Y
Lagka	Moraceae	*Artocarpus heterophyllus* Lamk.	Y	Y
Kiran *	Moraceae	*Artocarpus odoratissimus* Blanco		Y
*Terur talau**	Moraceae	*Artocarpus* sp.	Y	
*Pugi**	Euphorbiaceae	*Baccaurea macrocarpa* (Miq.) Muell.Arg.		Y
Sesila'	Caricaceae	*Carica papaya* L.	Y	Y
*Berangan**	Fagaceae	*Castanopsis costata* (Bl.) A.DC.	Y	
Buyor	Rutaceae	*Citrus* spp.	Y	Y
Piasau	Arecaceaea	*Cocus nucifera* L.	Y	Y
Lapun	Bombacaceae	*Durio zibethinus* Murray	Y	
*Kapab**	Clusiaceae	*Garcinia* cf. *beccarii* Pierre		Y
*Ubpul**	Clusiaceae	*Garcinia maingayi* Hook.f.		Y
*Lingat**	Meliaceae	*Lansium domesticum* Correa	Y	Y
Belunu	Anacardiaceae	*Mangifera caesia* Jack		Y
Lam	Anacardiaceae	*Mangifera indica* L.	Y	Y
*Felam**	Anacardiaceae	*Mangifera* sp.		Y
Bong	Poaceae	*Musa* sp.	Y	Y
*Sia**	Sapindaceae	*Nephelium cuspidatum* Bl. var. *eriopetalum* (Miq.) Leenh.	Y	Y
*Beritem**	Sapindaceae	*Nephelium ramboutan-ake* (Labill.) Leenh.	Y	
Markisa	Passifloraceae	*Passiflora edulis* Sims	Y	
Jambu	Myrtaceae	*Psidium guajava* L.	Y	Y
Jambu air	Myrtaceae	*Syzigium samarangense* (Blume) Merr. & Perry / *S. aqueum* (Burm.f.) Alston	Y	Y

These include cultivars as well as species that have been collected from the surrounding forest (as indicated in the table). People often collect seedlings of fruit trees when clearing areas of forest for cultivation. Other trees in the villages come from seeds that were saved from fruit that had been eaten. When someone eats a particularly tasty fruit, more often than not they will save the seed for cultivation. I saw this being done with seeds of *bua beleleh* (*Durio graveolens*) as well as those of apples, oranges, and mangoes from Sipitang market. Other trees in the villages are remnants of forest that used to be found here. Thus, one area of Long Pasia was only recently cleared of secondary forest to make way for new houses. There are many

fruit trees still growing here, saved when the forest was cleared, these including *bua sia* (*Nephelium cuspidatum* var. *eriopetalum*), *bua berangan* (*Castanopsis costata*) and *bua beritem* (*Nephelium ramboutan-ake*).

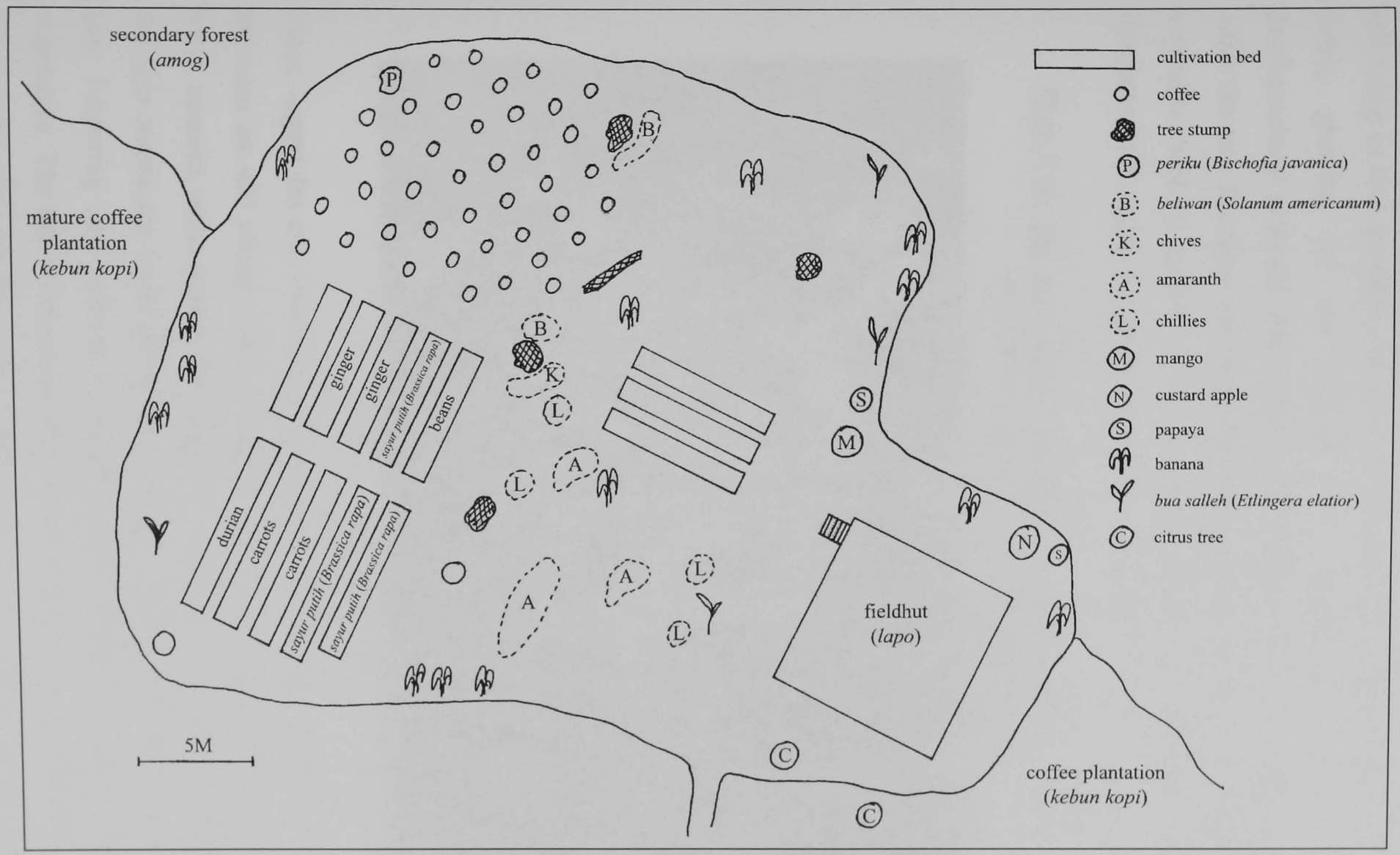
As well as fruits, people grow a few other edible plants around their houses. Some people grow vegetables. For example, one family had converted an old boat into a bed for growing mustard greens and cabbages. More commonly, people grow flavourings and spices, as these do not require much space. For example, celery, mint and chillies are often grown next to houses. People also grow a variety of fruits, vegetables and flavourings around their field-houses. Here, the diversity tends to be greater because there is more space available. The field-house and adjacent fields depicted in figure 3.1 are typical.

As I describe below, fields are the prime source of vegetables. In table 3.8 I have listed the species that are grown in swidden fields during the first year of cultivation. These vegetables are sown at the same time as, or soon after, the rice is planted, but they are harvested at different times. Fast growing annuals, such as *Brassica* and *Amaranthus* species, provide a source of green leafy vegetables after just a month. Cucurbits provide a source of leafy vegetables after a few months, and the fruits of these, cucumbers (*Cucumis sativus*) and gourds (*Benincasa hispida*, *Cucurbita* spp., *Momordica charantia*), are ripe 4 to 6 months later.

Table 3.8: Species grown with or alongside rice in swidden fields

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Kuru	Amaranthaceae	*Amaranthus* spp.
Sayur peit / sawi	Brassicaceae	*Brassica juncea* (L.) Czern.
Sedai / abi'	Brassicaceae	*Brassica juncea* (L.) Czern.
Sesei	Brassicaceae	*Brassica juncea* (L.) Czern.
Tadjak fadey	Cucurbitaceae	*Benincasa hispida* (Thunb. ex Murray) Cogn.
Timon	Cucurbitaceae	*Cucumis sativus* L.
Timon abai	Cucurbitaceae	*Cucumis* sp.
Tabo	Cucurbitaceae	*Cucurbita* sp.
Tadjak	Cucurbitaceae	*Cucurbita* sp.
Delei kerokob	Gramineae	*Coix lachryma-jobi* L.
Binamud	Gramineae	*Setaria italica* (L.) P.Beauv.
Delei	Gramineae	*Zea mays* L.

Figure 3.1: Plot of a field at Long Bayur

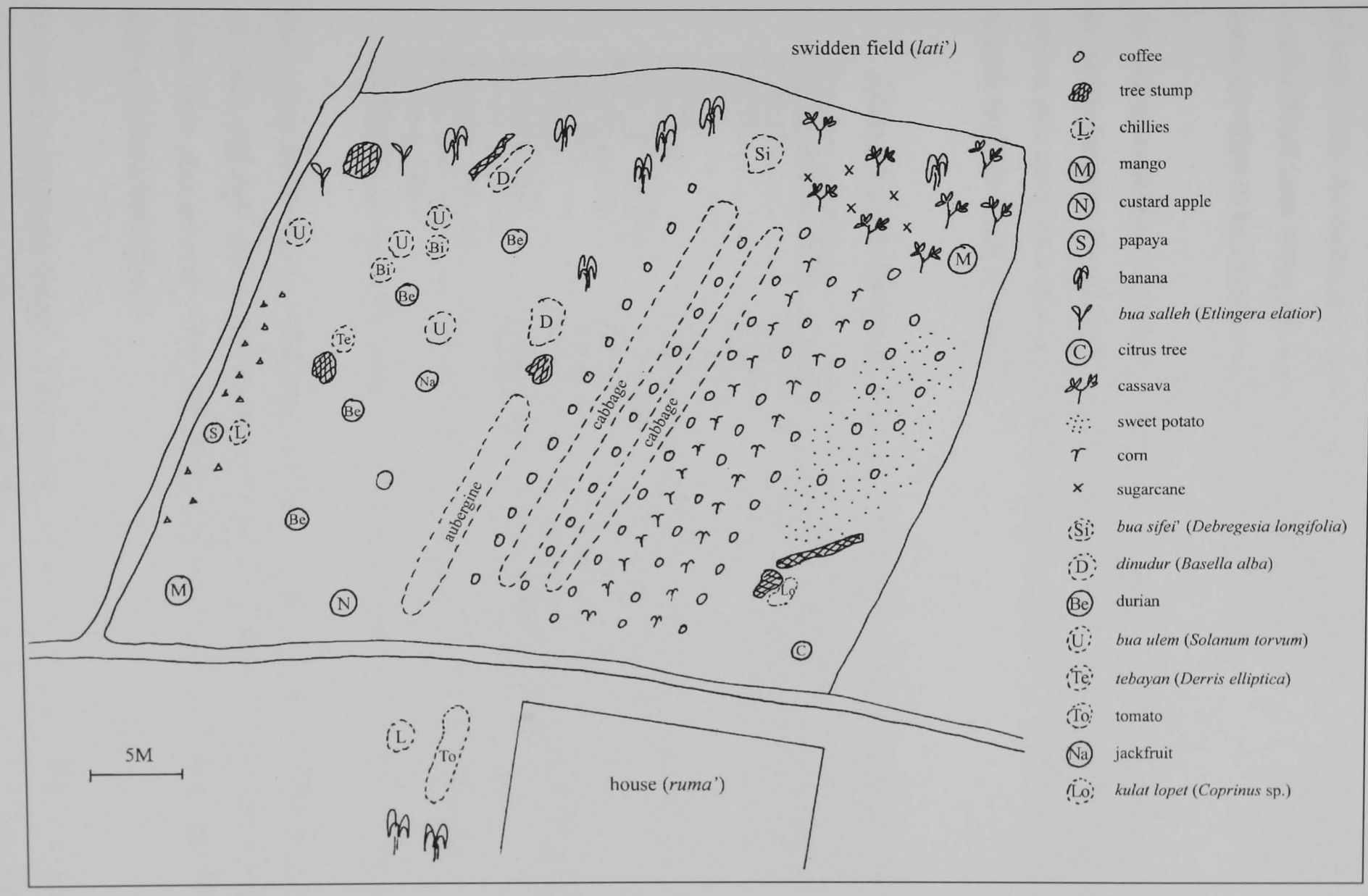


Another important resource found in the fields are mushrooms. The most common of these is *kulat kecep* (*Schizophyllum commune*), a mushroom that grows on the logs left lying in rice swiddens (plate 3.16). *Kulat lopet* (*Coprinus* sp.) also occurs in fields, growing on tree stumps. Less commonly, *tinunger* (*Auricularia fuscosuccinea*) is found, although this mushroom prefers more shady environments. After the rice has been harvested, the field may be left fallow or converted into a vegetable field, or coffee or fruit trees are planted. A plot of a vegetable field, illustrating the range of vegetables grown, is shown in figure 3.2.

Plate 3.16: The mushroom *Schizophyllum commune* (*kulat kecep*), found growing on a burnt log in a swidden field

Many vegetables are cultivated in the under-storey of coffee and fruit orchards when the trees are still young. Some species persist from previous years or they self-seed. Thus, cassava, sweet potato, Job's tears and mustard greens are all planted, but they are also commonly found along field margins, and in young fallows. In fact, in the year following rice cultivation, swidden fields continue to be a rich source of vegetables. The use of resources from fallow fields has been noted by a number of researchers, most notably, Dove (1985: 340). In his study of Kantu' agriculture, he recorded that harvesting of relishes from swidden fields continued for almost two years after these were planted.

Figure 3.2: Plot of a vegetable field at Long Pasia



Crops planted around field-houses also continue to provide a source of edible resources in the months and years after the house has been abandoned. For example, chilli bushes, tomatoes, and the ginger *likua* (*Alpinia galanga*), are often to be found at such sites. As mentioned above, people often cultivate fruits around their field-houses. Fruit trees typically have a life-span longer than that of a field-house, and so these are often to be found at long-abandoned field sites.

As well as cultivated vegetables, other non-cultivated vegetables are also to be found in young fallows. For example, on certain fields at Long Pinasat, where the soil is poorer, *pau sia* (*Stenochlaena palustris*) grows in abundance. Other species common at such sites are listed in table 3.9.

Table 3.9: Non-cultivated edible resources common in young fallow fields

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Pau sia	Blechnaceae	*Stenochlaena palustris* (Burm.f.) Bedd.
Tenem	Lauraceae	*Lindera pipericarpa* Boerl.
Bong	Musaceae	*Musa* sp.
Sibak	Musaceae	*Musa* sp.
Pau bulat	Oleanchaceae	*Nephrolepis biserrata* (Sw.) Schott
Biterung eit lipon	Solanaceae	*Solanum capsicoides* All.
Biterung pulung	Solanaceae	*Solanum ferox* L.
Bua ulem	Solanaceae	*Solanum torvum* Sw.
Terabak	Zingiberaceae	*Alpinia glabra* Ridl. / *A. nieuwenhuizii* Val.
Terabak fayeh	Zingiberaceae	*Alpinia ligulata* K.Schum.
Bua salleh / Bua beludu / Baku ucat	Zingiberaceae	*Etlingera elatior* (Jack) R.M.Smith
Baku tubu / Baku tubu nanong / Baku derayau	Zingiberaceae	*Etlingera punicea* (Roxb.) R.M. Smith

Old paddy fields also provide some resources. They are most important as a source of snails and fish, and of the reed *sier* (*Fimbristylis umbellaris*), used for weaving mats. They also provide a few vegetables, such as *kangkong* (*Ipomoea aquatica*) and *ginjer* (*Limnocharis flava*).

In later successional stages of secondary vegetation, different arrays of foods are found. Once trees predominate, fewer green leafy vegetables are found, although there are some that are only found in such vegetation, for example, *bata* (*Elatostemma* sp.), *dorey* (*Justicia obtusa*), and *keduang* (*Pseuderanthemum*

acuminatissimum), as well as certain mushrooms, in particular, *kulat aleng* (*Pleurotus* sp.) and *kulat buda'* (*Lentinus squarrosulus*). Secondary forest is also a rich source of fruits. Some species are common here because of their ecology, for example many of the *Garcinia* species usually occur in secondary forest. Here also are found those species that have been preserved, or were planted, when the area was cleared and cultivated. In table 3.10 I have listed the species of fruit tree found in a patch of secondary forest near to Long Mio. This area, which is rich in fruit trees, was apparently cleared 30-40 years ago. Today it is criss-crossed by paths because it lies between the village and the area where most people have their swidden fields. The species recorded were observed along the main path leading to the fields, a distance of about one kilometre.

Table 3.10: Fruit trees recorded along a 1km trail in secondary forest near Long Mio

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Teberecek buda'	Actinidiaceae	*Saurauia* cf. *longistyla* Merr.
Teberecek	Actinidiaceae	*Saurauia* sp.
Lam	Anacardiaceae	*Mangifera indica* L.
Felam	Anacardiaceae	*Mangifera* sp.
Bisian	Arecaceae	*Salacca vermicularis* Becc.
Kapab	Clusiaceae	*Garcinia* cf. *beccarii* Pierre
Ubpul	Clusiaceae	*Garcinia maingayi* Hook.f.
Kecii / Kayu mein / Tutuberu	Clusiaceae	*Garcinia parvifolia* (Miq.) Miq.
Lipau	Euphorbiaceae	*Baccaurea lanceolata* (Miq.) Muell.Arg.
Tuer	Euphorbiaceae	*Bischofia javanica* Bl.
Fayang	Flacourtiaceae	*Pangium edule* Reinw.
Fika labo / Mata lawid	Meliaceae	*Aglaia odoratissima* Bl.
Lingat	Meliaceae	*Lansium domesticum* Correa
Fudu	Moraceae	*Artocarpus kemando* Miq.
Kiran / Tarap	Moraceae	*Artocarpus odoratissimus* Blanco
Pidara / Semendara	Myristicaceae	*Horsfieldia* sp.
Arau / Kuceng	Tilliaceae	*Microcos* cf. *elmeri* Merr.

It is impossible to draw a clear line between secondary forest and old-growth forest, the one maturing into the other. Furthermore, the category 'forest' is very diverse, including as it does bamboo, heath and oak-chestnut forest. These various forest types each provide different resources.

Within the bamboo forest, little is found but bamboo (plate 3.17). (The species that dominate are *Gigantochloa levis*, *Bambusa vulgaris*, and *Schizostachyum brachycladum*.) However, sometimes occurring in the understorey are edible herbs, such as those found in secondary forest mentioned above, or *buthu* (*Schismatoglottis* sp.). Within heath forest, particular foods are very common, for example *wei sia* (*Daemonorops fissa*), *pau sia* (*Stenochlaena palustris*) and the fruits of various *Garcinia* species. A few foods are found only in this habitat, such as *busak liling pelanuk* (*Bromheadia finlaysoniana*) and the mushroom *kulat alub* (*Amanita* sp.). In oak-chestnut forest, few green leafy vegetables are found. This habitat is the source of some rattans, and occasionally mushrooms, but its prime importance is for hunting, as I describe in the following section.

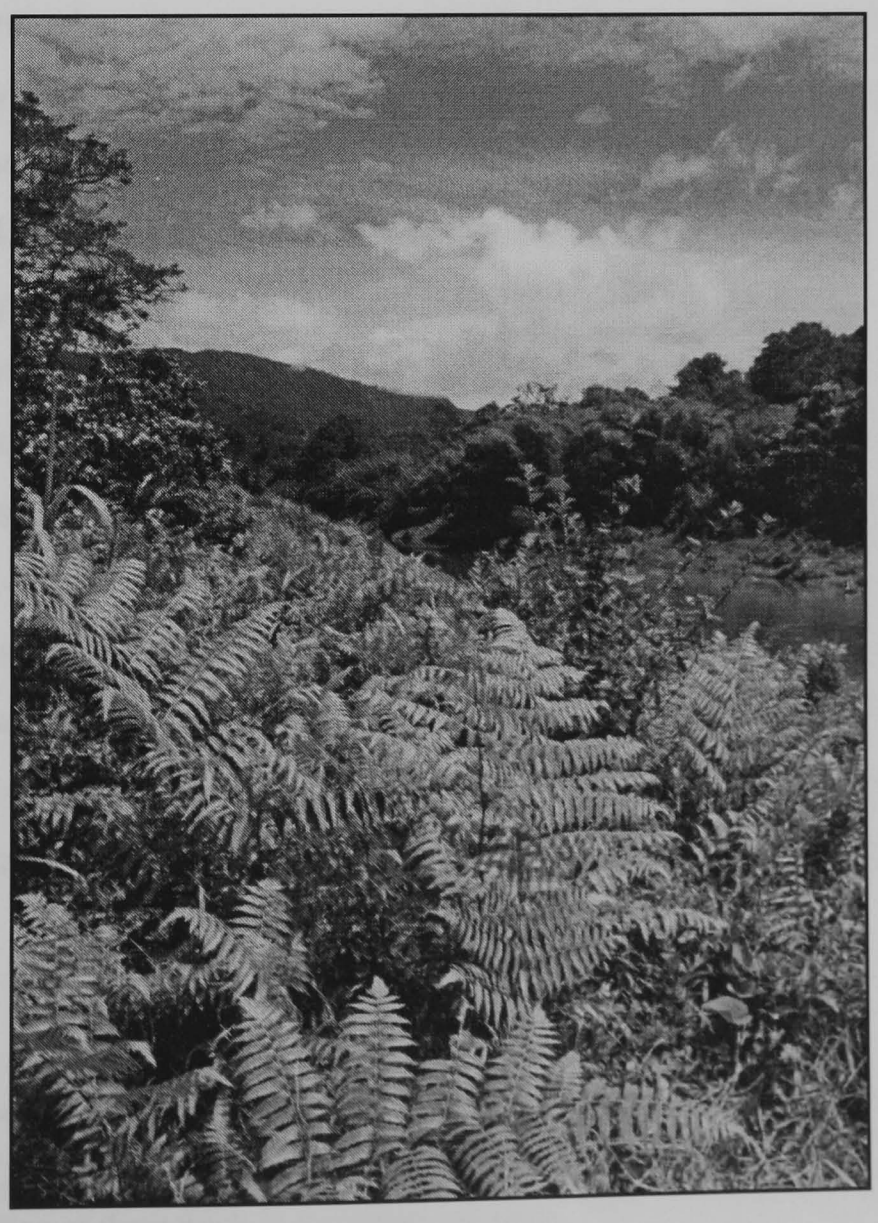
One habitat that I have not yet mentioned, and which is one of the most important as a source of vegetables, is riverside vegetation. In those areas of the riverbank most subject to flooding the vegetation is dominated by herbs, many of which are edible (plate 3.18). The most important of these are *siluk* (*Commelina paludosa*), *pau abpa* (*Diplazium esculentum*), and *tengayen* (*Pouzolzia hirta*). The ginger *baku ucat* (*Etlingera elatior*) and bananas are also common here, as are cassava and sweet potato.

This scheme, of neatly categorised habitat types is clearly overly simplistic. In the process of ecological succession, one habitat changes into another. Furthermore, 'forest' species colonise agricultural areas, and species introduced by people for cultivation spread into 'forest' areas. The patchwork pattern of fields and secondary vegetation encourages this process, since there is always a large seed-bank available for any ecological niche that opens up.

The patchwork nature of the vegetation is reflected in people's patterns of resource use, people utilising a variety of food sources. For example, on their way to the fields, people may make a divergence into the bamboo forest to collect the young shoots. Further along the trail they may pick fern tips, or collect the flowers and stems of *Etlingera* species from the riverside or field margins. Alternatively, a visit to the fields may be combined with a fishing trip. Several families have fields upriver from Long Pasia, travelling there by boat. It is not uncommon for people to do some

Plate 3.17: Bamboo forest near Long Mio

Plate 3.18: A stretch of riverbank covered by the fern *Diplazium esculentum* (*pau abpa*)



fishing when returning home from a day at the fields. As these examples illustrate, patterns of resource use are complex and varied. In the following section, I attempt to describe and explain these patterns.

3: 4: 2. Patterns of resource use

Patterns of resource use are shaped by people's preferences for the particular resources, their availability and ease of harvesting. In turn, ease of harvesting is influenced by people's activities, for example, when people are out hunting, other resources are accessible, such as rattans. Similarly, during periods of intensive agricultural work, food resources in the fields are those that are most readily available, and consequently, people tend to rely more on these (Colfer & Soedjito, 1996: 172 & 175; Dove, 1985: 343-344).

These factors are reflected in the data on the relative importance of different vegetation types as sources of side-dishes. As part of the dietary surveys, I asked people to record where they had harvested their foods – whether from old-growth forest, secondary forest, riverside vegetation, the fields or village, field margins and young fallow vegetation, or if they had been bought. The results are summarised in figures 3.3 and 3.4.[8] I included hunting and fishing as separate categories for two reasons. Firstly, because these figures may be slightly exaggerated, because of people's tendency to over-estimate the amount of fish and meat that they were eating, and presenting the data in this way makes it easier to see the effects this may have on the data. Secondly, people generally recorded all hunted meat as having come from old-growth forest. This is in spite of the fact that a considerable amount of hunting takes place within secondary forest, and to a lesser extent, in agricultural areas and fallow vegetation. It was therefore often impossible to know in which type of vegetation the animals had been caught. Domesticated animals, and also fish from fishponds and paddy fields, were included in the category of 'field / village'.

[8] The first dietary surveys are not included because the data on plant resources are incomplete. Subsequent to this, the survey forms were re-designed, enabling better data collection. Furthermore, these data do not reflect the importance of the different vegetation types as sources of fruits, because of the under-recording of these foods in the dietary surveys.

Figure 3.3: Sources of *kikid* in Long Mio

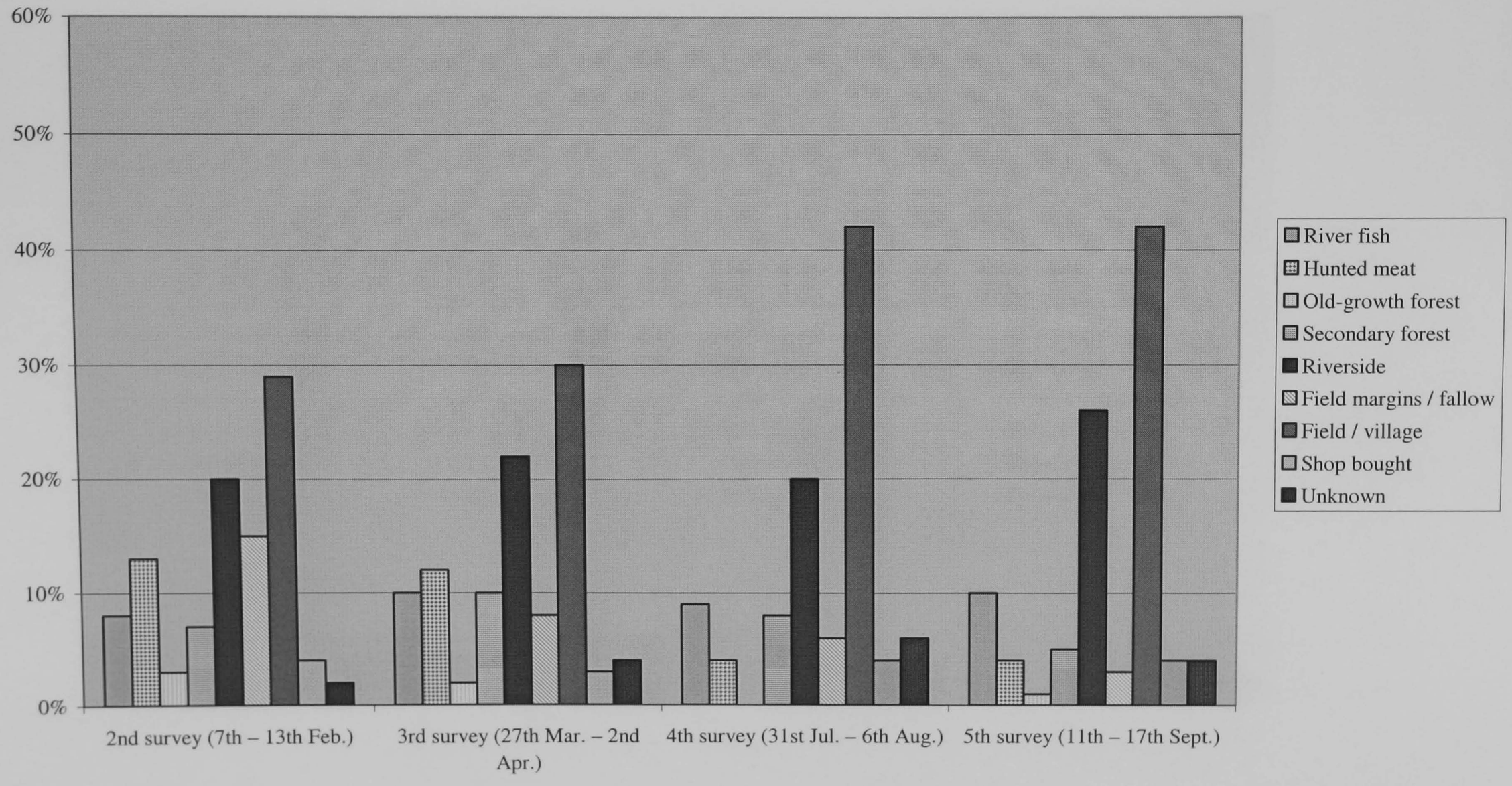
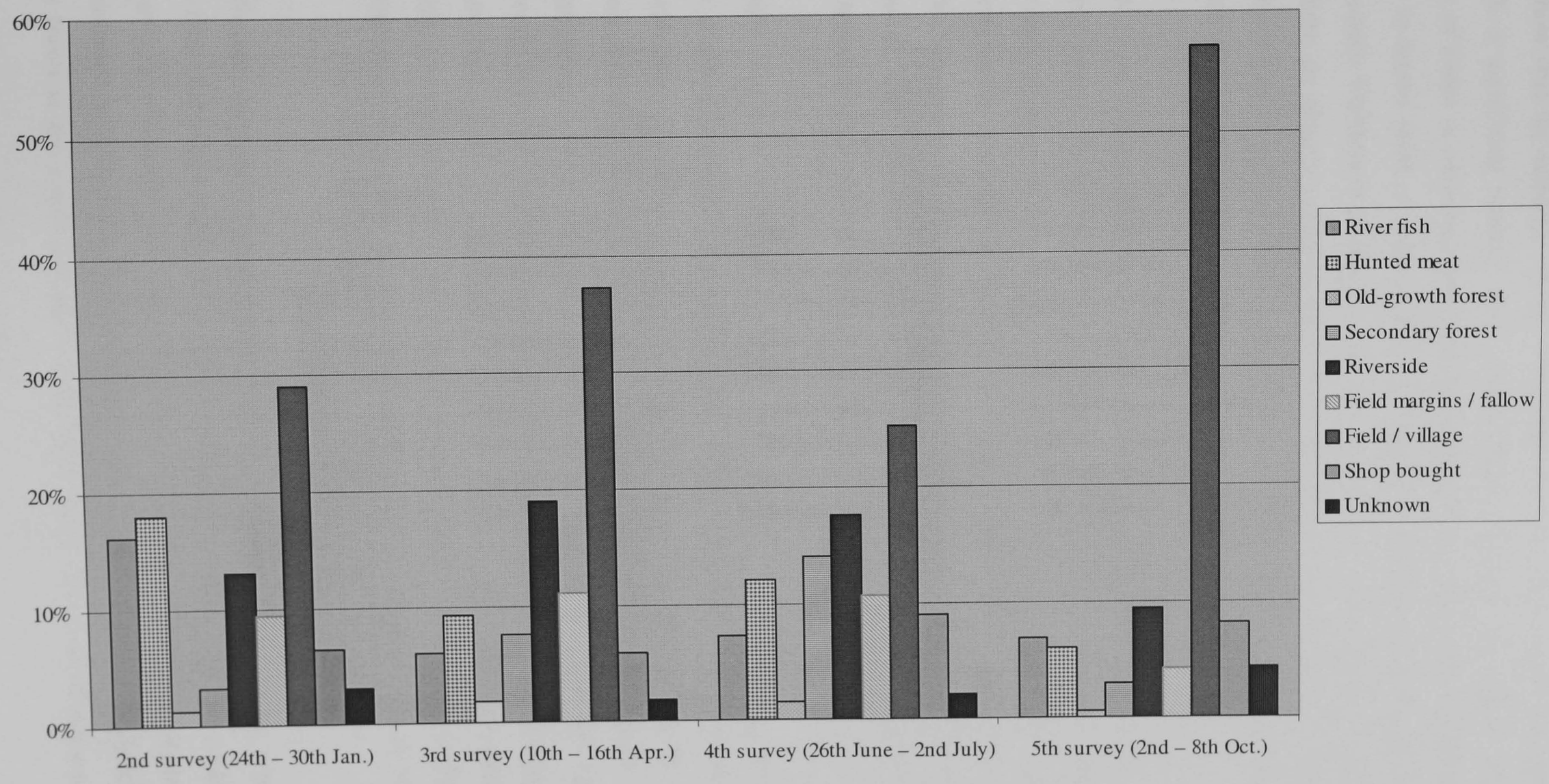


Figure 3.4: Sources of *kikid* in Long Pasia



The data show that the majority of the foods eaten as side-dishes come from the fields, with a significant number also coming from riverside vegetation. The importance of fields is not surprising, especially given the expansion in vegetable cultivation in recent years. A wide variety of vegetables are grown, providing an abundant supply. Furthermore, many people have fields near to the village, and so the foods here are readily available. Even for those people who do not have land close by, much time is spent working in the fields, and so the resources growing here are those that are easiest to collect.

Convenience then has a significant role in explaining people's pattern of resource use. For this reason, the riverside is also an important source of vegetables. The vegetation here is often dominated by edible plant species, making them easy to collect. Furthermore, there are extensive areas of this vegetation type close to both villages. The importance of riverside resources is apparent from the maps drawn by the women of both villages, in which they indicated the main areas used for collecting non-cultivated vegetables (figures 5.3 & 5.4).

In Long Mio, riverside vegetation is particularly important, contributing a greater proportion of the vegetables than in Long Pasia. This is because there are extensive areas of riverside vegetation nearby. A contributory factor is that the riverside is much nearer than most people's fields, and so it is more convenient for people to collect vegetables from here. In contrast, much of the riverside in Long Pasia has been converted to fields. Furthermore, there are many more people, and so harvesting pressure on those remaining areas near the village is quite high. At certain times, such as after a period of drought, the women commented that it was difficult to find enough vegetables to provide for their families from the riverbanks close to the village.

Old-growth and secondary forest are the source of relatively few edible plant resources, their main importance being as a source of hunted meat. However, certain plant resources predominate here, such as bamboo shoots. During the fourth dietary survey conducted in Long Pasia, bamboo shoots were in season, and consequently, secondary forest is the source of many more *kikid* during this time. There are a

number of foods that are seasonal. The availability of those *kikid* that have marked seasons is illustrated in figure 3.5.

Bamboos (*Gigantochloa levis*, *Bambusa vulgaris* and *Schizostachyum brachycladum*) send up new shoots only a few months each year, between June and August. At this time, there is a glut of this vegetable, and many people preserve the shoots by drying, enabling it to be stored for a few months. Fruits are another seasonal resource, with many trees fruiting between November and March. Only one such species is used as a source of *kikid, Pangium edule*, the fruits of which are ripe from December through to about February.

Many of the other seasonal resources are those grown in swidden fields, the agricultural calendar determining their availability. As I described in the previous section, a few weeks after rice planting begins, mustard greens (*Brassica* spp.) and spinach (*Amaranthus* spp.) are ready for harvesting. It is these vegetables that account for the much greater significance of fields as a source of *kikid* in the fifth dietary surveys, these conducted during the time of rice planting. A contributory factor is that this is a period of intense agricultural activity, and so people do not have time to collect vegetables from elsewhere.

A month or so later, around November, the leaves of squashes (*Benincasa hispida*, *Cucurbita* spp., *Momordica charantia*) and cucumbers (*Cucumis sativus*) can be harvested, and they continue to provide a source of green vegetables through until the end of rice harvesting (March or April). Their fruits take a few months to mature, ripening from January onwards.

Snails are another seasonal food, once again, their availability being linked to people's agricultural activities. During the relatively slow period between rice harvesting and clearing the fields for next year's crop, from April to June, snails make up an important part of the diet. This is because at this time of year the women do not have much work to do, and so they have the time to collect snails. Furthermore, the paddy fields are free of rice, and so people are able to collect snails as well as fish. This accounts for the higher numbers of 'river fish' recorded in the third Long Mio survey (where most snails are collected from a lake, and so were

Figure 3.5: Seasonally available *kikid*

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
RAIN-FALL	*	*	**	**	**	**	**	*	**	***	***	***
	Rice havesting					Forest clearing		Burning	Planting		Weeding	
SEASONAL RESOURCES	Squashes and cucumbers											
	Squash and cucumber leaves											
						Bamboo shoots						
									Mustard greens & spinach			
	Pangium edule											
				Snails								

included as river fish), and also for the relatively high numbers of side-dishes coming from the 'field/village' in the third Long Pasia survey (where most snails are collected from paddy fields).

The amount of hunting that goes on is also related to people's other activities. Thus, when the men are busy with agricultural work, as during the fifth hunting surveys when they were involved with rice planting, hunting activities decline. Also significant in influencing the amount of hunting is the availability of game. As I described in chapter two, animal populations vary, particularly in relation to the availability of food. Most significantly, boar populations increase dramatically during mast fruiting events. Apparently, at such times many boar are hunted. Although there was no mast fruiting during the period of my fieldwork, many species were in fruit during the first and second dietary surveys. Reflecting this, greater numbers of animals were hunted during these survey periods (tables 2.3 & 2.4), and more meat was eaten at this time (figures 3.3 & 3.4).

Certain other resources vary in availability, although not necessarily at the same times each year. For example, the orchid *Bromheadia finlaysoniana*, the flowers of which are harvested as food, usually grows in dense colonies, and these flower synchronously. A major factor influencing the amount of fish that is eaten is the timing of fish spawning (described in section 2: 3: 2a). Such an event took place during the second dietary survey in Long Pasia, and many people went fishing and made large catches. Consequently, fish made a much greater contribution to the diet during this period.

A final aspect of the data which needs to be mentioned is the contribution of shop-bought foods to the diet. In Long Pasia, slightly more foods are bought than in Long Mio (7% and 4% of *kikid* recorded in the food surveys respectively), this in part reflecting their greater availability here. (There are three stores in the village, in comparison to Long Mio's one store.) More significant is the greater affluence of some people in Long Pasia, where there are several families whose members have pensions from long careers in the civil service, and where the staff of the school and medical clinic live. In Long Mio, only the village headman and the WWF project officer have regular earnings from a source other than agriculture. Consumption of

shop-bought foods has apparently increased in both villages in recent years, as I discuss in more detail later in this chapter.

3: 5. Explaining what people eat

As I highlighted in the previous section, convenience has a large part to play in shaping patterns of resource use and the foods that people eat. However, this does not explain everything. People's preferences for particular resources are also important. Thus, as I have highlighted throughout this chapter, a diet that includes a variety of vegetables as well as meat and fish, is an ideal of the Lundayeh. Consequently, much time and effort is devoted to hunting and fishing, and to harvesting a range of plant resources.

People also have preferences for particular foods. These may reflect personal taste, or the particular cultural values with which a food is associated. For example, I mentioned earlier in this chapter that only if someone has eaten rice are they considered to have eaten. Thus, rice is regarded by the Lundayeh as the only staple food. However, for some other peoples of the region, such as the Penan (Brosius, 1991; Sellato, 1994), sago provides the staple. The Lundayeh regard this food as inferior to rice. They no longer eat sago, and in the past, they turned to this food only in times of famine. Part of the reason for this seems to be that sago is regarded as a 'forest food', and a food of people that live in the forest. Such a way of life is seen as inferior to the practice of swidden agriculture. This example illustrates the way that particular values can determine the resources that are utilised, and which foods people choose to eat. In the following section I describe the cultural values associated with particular foods and consider their influence on dietary patterns.

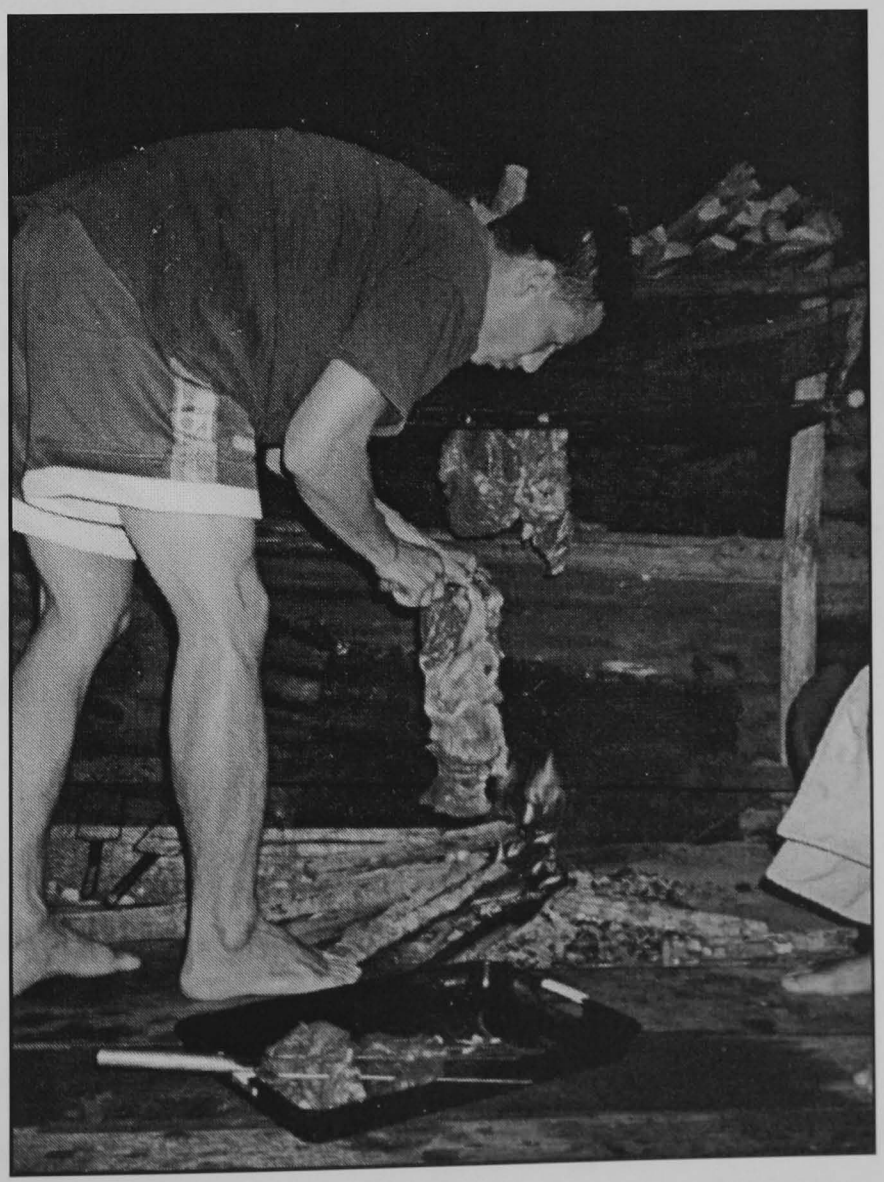
3: 5: 1. Tradition, identity and food preferences

An important factor in determining food choices is tradition, people tending to have strong preferences for their traditional foods (Fischler, 1988; Johns & Kuhnlein, 1990). This is partly because people acquire a taste for foods that they have been brought up on. For example, the elderly people of Long Mio and Long Pasia, used to

eating *luba' laya'*, find rice that is not cooked in this way too dry. Also significant are the links such foods have with identity.

When asked to describe the traditional foods of the Lundayeh, people most commonly responded by listing a number of foods. First among these was boar, or more specifically, pickled boar (*telu'*). Pickled boar is regarded as a great delicacy by most. It is made by mixing raw boar meat with salt and boiled rice. This is then packed into bamboo stems, in which it is stored for at least a month, at which time it is ready to eat. Other traditional foods mentioned were *biter* (rice porridge), *luba laya'* (wrapped rice), *borak* (rice wine), and also hill rice (in contrast to wet rice). Some people also listed traditional methods of preparing foods, such as pickling and smoking meat or fish (methods of preservation) (plate 3.19), and of cooking various foods inside bamboo, for example, *noney*.

Plate 3.19: Smoking boar meat over a kitchen fire



These foods are seen as an important aspect of Lundayeh identity and, with the exception of *borak*, are something that people are proud of. Some of these foods are linked with identity because of their association with a particular way of life. As I described in chapter two, hunting is regarded as an important part of Lundayeh identity. This is part of the reason for the high status of hunted meat, and boar meat in particular, and why people wish to eat this meat. (Another reason is that it tastes delicious.) Similarly, people wish to eat hill rice not only because it is considered tastier than wet rice, but also because its cultivation is regarded as part of Lundayeh culture, this having been the way of life of their forebears.

The Lundayeh do not, as Dove (1985: 347) reports of the Kantu', 'prefer their cultivated relishes to the wild relishes.' People's preferences are, typically, more specific than this. For example, many people have a strong liking for the slightly bitter tasting leaves of *sedai* (*Brassica juncea*) and *don tadjak* (*Benincasa hispida*), both cultivated species. However, equally popular are the 'wild' vegetables, *tengayen* (*Pouzolzia hirta*) and *pau sia* (*Stenochlaena palustris*). Certain forest resources are highly sought after, for example, some of the mushroom species. On one occasion, when people heard that someone had found *kulat upul* (*Lentinus sajor-caju*), several groups went off looking for more, as this mushroom only occasionally fruits, apparently depending on the right weather conditions. Furthermore, people have a strong preference to eat meat (most of which comes from hunted game). Thus, forest resources are appreciated because they add diversity to the diet. The only time at which a preference for cultivated foods is manifest is during *irau*, and this reflects social obligations rather than personal preference – many people told me that they did not actually like eating pork or buffalo meat, and would much rather eat game. I discuss the significance of food choice at *irau* in chapter four.

However, there does exist some ambivalence towards forest foods. On the one hand, people value these foods because of their taste and the variety they add to the diet. Furthermore, many people are proud of being knowledgeable about the forest and its resources. They do not see themselves simply as swidden farmers, but also recognise their dependence on the forest. The reality of this perception is apparent from the patterns of resource use in Long Pasia and Long Mio, described in the previous

section. However, at times, people also feel some embarrassment at using 'forest foods' and of being regarded as 'forest people', because of a perception that this is a backward way of life. This feeling is particularly acute among the younger generation, most of whom aspire to careers and a life in town. A desire for what is seen as a more 'modern' life-style and for 'development' is bringing many changes to Lundayeh society and way of life, as are external pressures. Some of these changes are reflected in changing dietary patterns, to which I now turn.

3: 5: 2. <u>From pickled boar to chicken wings – changes in the diet</u>

I sought to build up a picture of how people's diet has changed over the last 60 or 70 years, a time-span equivalent to the lifetimes of today's elderly generation. To do this, I talked with a range of people, from young adults through to the very elderly. In these discussions the following questions were raised: how has people's diet changed; are there any foods people used to eat that are no longer eaten; why has this been the case; what foods have only recently been introduced, particularly crops; and what changes have there been in beliefs and behaviour related to food?

When I asked elderly people about how their diet differed in the past, usually the first answer I received was that people used to drink *borak*. *Borak* (rice wine, although sometimes cassava was used) was a central part of Lundayeh culture and social life, as it was and continues to be today for many other Borneo peoples (Dove, 1988; Harrisson, 1959a). On receiving visitors, *borak* and tobacco were always offered. *Borak* was also an essential component of all celebrations and life events, for example, at weddings, funerals, and following successful headhunting expeditions. The Lundayeh stopped making and drinking *borak* under the influence of the missionaries. Those from the evangelical churches, who were working with the Lundayeh, regarded ceasing this practise as an important part of the process of people's conversion to Christianity, as well as a central step in helping their 'development' and 'advancement' (Appell, 1997; Dove, 1988). In Long Pasia and Long Mio people converted to Christianity during the 1930s, and production of *borak* stopped completely in the 1940s. Smoking of tobacco was also condemned by the church, although not so forcefully, and today it is tolerated, at least for men.

Borak has today been replaced by hot drinks, such as tea, coffee and hot chocolate. It is these drinks that are offered today when people come visiting a household, and similarly at *irau*, the hosts provide large quantities of hot drinks and biscuits. Alcohol is still drunk, mainly by the young men. However, it is no longer an integral part of cultural life, and its consumption is strongly condemned, both by the church and the village authorities. For some, drinking is a way of rebelling against the sometimes claustrophobic village life, or of providing temporary relief from this.

This then has been the most radical change in the eating, or rather, food consumption practices of the Lundayeh during the lifetime of today's elderly generation. Another change during this time has been the dropping of food taboos and food proscriptions. This also took place with people's conversion to Christianity, together with ceasing the practise of augury and belief in omens. However, these changes would not have had a major impact on people's diet, simply because there were few food taboos. There were apparently no animals or plants that were taboo as food for everyone, although some people told me that the meat of *ribuan* (masked palm civet) was considered to be too strong for young people. Another food that could not be eaten by the young was *wang dereh*. This is the meat that runs down either side of an animal's backbone. However, excluding this meat from the diet would not have had any significant impact on the diet. The only time when food taboos seemed to have been significant is during pregnancy and the time of breast-feeding. During pregnancy, mothers were not allowed to eat various foods, for fear that the baby would take on some characteristics of the food, or that the birth would be difficult. For example, if bear meat was eaten, then it was feared that the baby would be born with stunted arms and legs. If tortoise meat was eaten, it was thought that the birth may be difficult, as the baby will want to stay in the stomach just as a tortoise stays hidden within its shell. Today, these rules are no longer followed, although the belief that a baby will take on characteristics of the mother's food still persists. Thus, I was told by one young mother that when she was pregnant she had strong cravings to eat crabs. However, she was afraid to eat too many of these as she had heard that if she did so, her baby would be likely to pinch people when it was older. Similarly, some women like to drink coconut milk when pregnant, in the hope that their child will have pale skin.

After birth, new mothers only ate rice porridge and cured (smoked) meat, as it was thought that all other foods would cause the baby to get a bad stomach. Today, breast-feeding mothers are still encouraged to eat porridge and cured meat, and these foods typically make up the main part of their diet. However, other foods are also eaten in small quantities.

The other main change that has taken place over the last 70 years or so is a decline in the use of forest foods. In parallel with this, there has been a change in agricultural strategies, with people growing many more and a much wider range of cultivated vegetables. Furthermore, people have come to rely to an increasing extent on shop-bought and processed foods, particularly in the last decade. The shift away from using forest foods seems to have been a gradual one, and it is difficult to quantify. However, it is apparent that such a change has taken place not only from the comments of the older generation, but also from the loss of knowledge about edible resources among the younger generation.

Plate 3.20: A variety of now neglected foods, collected from a stream, including crabs, larvae and fish

Elderly people told me of certain foods that are no longer eaten, or are eaten only rarely today. For example, mice and squirrels are no longer eaten, except occasionally by children if they catch them in traps, or succeed in shooting them with a blowpipe or air-rifle. In addition, insects are rarely eaten nowadays, as I described in section 3: 3: 2. Other 'neglected' animal foods are tadpoles, animals found in small streams, such as crabs, dragonfly larvae, snails, and various small fish (plate 3.20). The characteristic that these foods have in common is that a large amount of effort is required for gathering them with relatively small returns, these foods typically being small in size and occurring in low densities. Consequently, people today do not bother with them, as there are easier alternatives available.

The only plant food that I was told of that is no longer eaten today is sago. In fact, no-one in their 20s or younger was aware that sago could be harvested from *kinangan* (*Eugeissona utilis*). There are a number of edible plants only rarely eaten today, something that became apparent when I was making plant collections. On several occasions, plants were shown to me that could be eaten, but which today, are rarely, if ever, collected (see table 3.11).

Few of these resources were known by younger people. Among the adult population, even those in their 40s and 50s, there were many who did not know these, or their names. This was clearly demonstrated during workshops held with the villagers. In these sessions, I asked the men, women and school children to identify photographs of a range of edible resources. Out of a total of 28 photographs, 8 were of species that are rarely used today (those marked with an asterisk in the table below). The differences in response are summarised in table 3.12. To cite just one example, indicative of the variation in knowledge, half of a group of 30 men, 12 out of 28 women, and all of the 19 school children, did not know that *tecung ubeh* (*Colocasia oresbia*) had edible fruits.

The reasons for the decline in use of certain resources are varied and complex (Kuhnlein, 1992). However, some factors can be identified. One reason is that people's contact with the forest has been decreasing. This has been because of the need for children to attend school in town. In addition, increasing numbers of people seek employment in the towns, a trend that seems set to continue in the future. For

Table 3.11: Rarely used edible plant resources
(* indicates species used in plant identification exercise)

LUNDAYEH NAME	FAMILY NAME	SCIENTIFIC NAME
Kelang batu	Apocynaceae	cf. *Leuconotis* sp.
Kelang	Apocynaceae	*Willughbeia coriacea* Wall.
*Tecung ubeh**	Araceae	*Colocasia oresbia* A.Hay
*Riman**	Arecaceae	*Caryota mitis* Lour.
Wei tei' lal	Arecaceae	*Ceratolobus concolor* Bl.
Wei kurad	Arecaceae	*Daemonorops didymophylla* Becc.
Wei laasun	Arecaceae	*Daemonorops ingens* J.Dransf.
Wei lingan	Arecaceae	*Daemonorops sabut* Becc.
Wei laya	Arecaceae	*Daemonorops sparsiflora* Becc. / *D. didymophylla* Becc.
*Kinangan**	Arecaceae	*Eugeissona utilis* Becc.
Wei ser	Arecaceae	*Korthalsia ferox* Becc.
*Terur garang / Ticuk mangai'**	Clusiaceae	*Garcinia dryobalanoides* Pierre
Siluk fulung	Costaceae	*Costus speciosus* (Koenig) R.M. Smith / *C. globosus* Bl.
Terur berek / Terur baka / Terur payo	Euphorbiaceae	*Baccaurea* sp.
Fidaawee	Fagaceae	*Castanopsis acuminatissima* (Bl.) A.DC.
Tei' suit bueng	Loranthaceae	*Dendrophthoe pentandra* (L.) Miq.
*Afa' fulung**	Menispermaceae	*Albertisia* sp.
Fudu	Moraceae	*Artocarpus kemando* Miq.
Lison okok	Moraceae	*Ficus* sp.
Uber	Myrtaceae	*Syzigium polyanthum* (Wight) Walp.
*Pau bulat**	Oleanchaceae	*Nephrolepis biserrata* (Sw.) Schott
*Demicir**	Sapindaceae	*Lepisanthes fruticosa* (Roxb.) Leenh.
Biterung eit lipon	Solanaceae	*Solanum capsicoides* All.
Pau abu / Pau kapur	Woodsiaceae	*Diplazium polypodioides* Bl.
Tubu beritem	Zingiberaceae	*Alpinia* sp.
*Tubu terutung**	Zingiberaceae	*Plagiostachys* sp.

Table 3.12: Results of plant identification exercises

% CORRECT RESPONSES	ADULT MEN (n = 30)	ADULT WOMEN (n = 28)	CHILDREN (n = 19)
RARE PLANT RESOURCES (8 species)	78%	78%	9%
COMMON PLANT RESOURCES (20 species)	100%	90%	53%

the majority of today's school-age children, their aspirations are to work and live in town, few wishing to become swidden farmers.

People also have less contact with the forest because there is less hunting going on. The prime reason for going far into the forest, and into the old-growth forest areas is to hunt. However, with animals becoming harder to find, people are less interested in spending their time on hunting trips. Another reason to go into the forest is to travel. For example, people walk from Long Pasia and Long Mio to visit relatives in Kalimantan and Sarawak. On these trips, resources such as rattans and fruits are sometimes collected, or their whereabouts is noted for later harvesting. Today, with the expanding network of roads, visiting places on foot is becoming less frequent. Consequently, because it is felt that it is not worth travelling long distances purely for the sake of forest resources such as fruits and rattans, their collection is in decline.

Thus, as people's way of life changes, their exposure and access to resources changes. There are also changes in people's agricultural activities. Agriculture is becoming more intensive, with a shift towards permanent cultivation of fields. In particular, there has been an expansion in land devoted to vegetable fields, because of interest in growing these as a cash crop, as well as coffee and tobacco. This has been encouraged by the government, through the Department of Agriculture (*Jabatan Pertanian*) and the Rural Development Corporation (*Korporasi Pembangunan Desa - KPD*). These departments have also been responsible for introducing a number of new crops, and crop varieties. For example, they have encouraged people to grow corn as a cash-crop (growing a variety used as animal feed), providing seed and guaranteeing purchase. Most recently, during the year of my fieldwork, trials of potatoes began in Long Mio. Subsidies are also provided for coffee, tobacco and wet rice cultivation. One consequence of this, felt in Long Pasia, is that there is a reduction in the availability of certain resources. Near to Long Pasia, many of the permanent fields are situated adjacent to the river, and so riverside vegetation is much more limited. One resource that I was told is now much less abundant is *baku ucat* (*Etlingera elatior*).

In chapter two I described how many of the younger generation are more interested in cash-cropping than in hill rice cultivation. A decline in the area of land devoted to swiddening would have a number of consequences. Firstly, the way in which people interact with the forest will change radically. With a shift to permanent fields, there is no longer the need to clear new areas of land every year. Furthermore, there will be a change in the ecology of the region – the system that has created the patchwork pattern of forests at various stages of regeneration will be undermined. This will impact on the availability of resources, since there will no longer be extensive areas of fallow and secondary vegetation.

Another factor in the decline in use of forest resources has been an increase in the availability of processed foods. Today, if there is no meat or fish in the house, people can readily buy tinned products from the store in the village. Tinned meat and fish, instant noodles, sweets, crisps, and sugar are all eaten far more commonly than just 10 years ago. In particular, sugar consumption, largely in the form of hot drinks, is much higher now than in the recent past, and even more so than 60 or 70 years ago. With regard to sugar consumption, this has in part been because of the replacement of *borak* by hot (sweet) drinks. More recently, increase in sugar consumption and of all other processed foods has been enabled by easier transportation. With the arrival of the road, transport of goods became much easier and cheaper. Previously, goods had to be carried (one day's walk from Long Semado (a village across the border in Sarawak), or a week's walk from Sipitang) or flown in on the weekly flight from Lawas (this at a price and with limits on weight). In addition, more people have a source of cash income today than previously, with many households having members working in the towns or logging camps, and all families growing cash crops of some kind. Today, with stores in both villages, when people have no vegetables or meat in the house, they can easily go and buy something.

Processed foods have not only increased because of easier availability and the money to buy them, but also because some of these foods provide easy alternatives to local products. Therefore, as mentioned above, rather than going out to look for foods that may take a lot of time and effort to collect, such as crabs or insects, people buy alternatives. Similarly, the leaves of the vine *afa' fulung* (*Albertisia* sp.) used to be used as a flavour enhancer in the same way as monosodium glutamate (MSG).

However, this plant is not very abundant, and at least today, is not found close to the villages. It also involves hard work to pound the leaves into a powder, the form in which it is used. Consequently, with MSG being so cheaply available, it is this that is almost universally used[9]. Honey is also rarely collected nowadays, apparently because people are not willing to attempt climbing high into the tree canopy to harvest it, when honey and sugar can be bought in the shops. Bought cakes and biscuits are now more commonly eaten than similar foods made from rice or corn, such as *noney* or *tinafey*. Although people choose to buy cakes because they like the taste, also important is the fact that they are more convenient, as it involves a lot of work to make *noney* and *tinafey*.

Other processed foods are being eaten largely as a replacement for local alternatives because these have become harder to obtain. Thus, tinned meat and fish are eaten when no game or fresh fish are available. If given a choice, everyone would prefer to eat the latter, but to eat tinned meat is better than to have no meat at all. Also, shop-bought cooking oil is most commonly used today, rather than the rendered fat of wild boar. Once again, this is not out of choice, as lard is far tastier for frying foods than is cooking oil. However, the supply of wild boar is not enough to provide fat for everyone's cooking needs. I was repeatedly told that game and fish are much less abundant than in the past. A large body of anecdotal evidence supports this, with various tales recounted to me of how much easier it was to catch game in the past. Thus, I was told that when people went on hunting trips in the past, they would usually come back with several animals. Today, hunting trips are often unsuccessful. Furthermore, people would usually have several tins of *telu'* (pickled boar) and of lard stored in their houses at any time. Today, these items are becoming luxuries.

Undoubtedly people's perceptions of the past are at times somewhat rosy. However, the fact that there was a high level of agreement in what I was being told, does make it more convincing. Furthermore, there is some evidence that confirms what people are saying. This comes from hunting surveys carried out in Long Pasia in 1993 (Bennett et al., 2000: 307-310). At this time, there was no logging in the area, and the road had not yet reached Long Mio. The population of the village was also smaller,

[9] *Afa' fulung* is still occasionally used. This is because it is said to provide a better flavour than MSG, and not to have any of the suggested health consequences of MSG.

with only 40 households, in comparison to today's 68. As part of this research, data were recorded of the percentage of evening meals containing wild meat and local river fish (Bennett, pers. comm.). I do not know at what time of year this information was recorded. However, these figures are considerably higher than those from all the dietary surveys that I conducted (table 3.13).

Table 3.13: Long Pasia dietary surveys

	1993 (BENNETT)	1999-2000 (HOARE, FIELD DATA)					
% MEALS CONTAINING:		Survey 1:	Survey 2:	Survey 3:	Survey 4:	Survey 5:	Mean %:
HUNTED MEAT	39	33	31	20	27	19	26
RIVER FISH	40	23	29	11	16	21	20

Certainly, it would be surprising if there has not been a decline in the numbers of game and fish because of the changes that have taken place in the last decade. These have included an increase in population, both within the village of Long Pasia (Long Mio has in fact declined in numbers), and from the establishment of logging camps throughout the area. In addition, logging in the area has caused forest loss as well as noise and river pollution, and the logging roads have enabled easier access to more remote parts, both to villagers and to outsiders.

These trends – an increasing reliance on processed foods, and reared and cultivated foods, in parallel with a decline in the use of forest resources – seem set to continue. The health consequences of this are unclear, requiring detailed nutritional research to determine. One possibility is that there will be a decline in the nutritional value of the diet, as this has been the pattern elsewhere (Appell, 1986a: 58; 1988: 279). For example, an increase in the consumption of processed foods will result in increased salt and sugar intake, over-consumption of which can have negative health consequences. Furthermore, forest resources may 'improve the quality of diet by amplifying the range of nutrients consumed' (Etkin, 1994: 8). In the case of the Lundayeh, whether the cultivated and shop-bought foods that are replacing forest resources are equivalent nutritionally is unclear. At least with respect to plant resources, a wide range of vegetables and fruits are cultivated. Therefore, it seems

unlikely that increasing reliance on these will have a negative impact on nutrition. Potentially more problematic is the decline in game meat as this is having an impact on protein intake. There is evidence that the reduction in consumption of hunted meat and local fish is not being entirely compensated for by meat from domesticated animals or shop-bought meat. This is suggested by the fact that on average, just 34% of meals include meat and 35% of meals include fish, these figures including hunted game or local river fish, and also meat and fish that has been reared or purchased in the shops. These are lower than the figures recorded by Bennett in 1993, cited above, suggesting that meat and fish consumption today is lower. This is further supported by the comparison, made earlier in this chapter (section 3: 3: 2), of Lundayeh meat consumption with that of Kenyah and Kantu' communities.

Forest resources are not only important in helping people maintain a balanced diet, but can also contribute to food security (Etkin, 1994; Fleuret & Fleuret, 1980). Many non-cultivated foods are harvested when cultivated ones are unavailable, and so they serve to ensure that a variety of foods are always available (Kunstadter, 1978: 185). Local resources, adapted to local conditions, may be particularly important in the diet during times of seasonal scarcity, or at times of drought or other environmental conditions (Johns & Kokwaro, 1991: 103; Ogle & Grivetti, 1985: 194). The Lundayeh no longer have to rely on forest resources if they face hunger, as they prefer to buy rice, and most people have the money to do this. However, at times of hardship, people may economise by not buying vegetables, meat and other foods. If forest resources are unavailable, nutrition may suffer, the risk of nutritional deficiencies clearly being greatest for those people that are poor, in either money or land (Doolittle, 2001: 91-92).

Today, forest resources still add much diversity to the Lundayeh diet, contributing the bulk of the meat and fish that is eaten, as well as a significant number of fruits and vegetables. Whether this will continue to be possible in future years seems unlikely because of the rapid environmental changes that are taking place. As well as the possible consequences for nutrition and food security, also at risk is the unique Lundayeh cuisine. Thus, we see today that people are eating chicken and tinned meat instead of *telu'*, pickled boar meat, because of the decline in wild boar. Although *telu'* is very highly valued by the Lundayeh, it is becoming a rarity.

CHAPTER 4: THE ULU PADAS ENVIRONMENT – WILDERNESS OR MANAGED FOREST?

4: 1. Introduction

The aim of this chapter is to address the question of whether the Ulu Padas environment is, in any sense, a wilderness, or whether it is more accurately described as a 'managed' environment. I do this through examining the impact that the Lundayeh have had on the environment, in particular through hunting, fishing, agriculture, and use of plant resources. As well as addressing this question at the level of the environment, I also examine the extent to which people have influenced specific resources. In the light of these data, I ask what is meant by the terms 'wild', 'cultivated' and 'managed', and consider whether these are useful or misleading concepts.

4: 2. The Borneo landscape as a wilderness – changing views

The landscape of the Ulu Padas is (or at least was, until recently) one of hills and mountains covered by forest and traversed by streams and rivers. The impact of people on such a landscape is not immediately apparent to the untrained eye, and it is all too easy to view such a landscape as a wilderness untouched by humans. Indeed, until recently such has been the view, not just of this part of Sabah, but for the whole interior of Borneo.

Since the first reports of traders and explorers in the sixteenth century, an image has been created of Borneo as 'a country of wild men, [and] dense forests' (Rutter, 1922: 7). Many early accounts describe the apparent bountifulness of the environment, on which the influence of man was thought to have been insignificant. For example, the English seaman Beeckman (quoted in King, 1992: 63 & 67), who travelled to Borneo in 1713, wrote: 'The country abounds with pepper, dragons-blood, bezoar, most excellent camphire... and with all sorts of fruit. The mountains yield diamonds, gold, tin and iron; the forests, honey, cotton, deer, goats... and a multitude of monkeys.' Later in his account he also writes: 'The inland inhabitants are... fierce, warlike and barbarous.' A traveller to Borneo in the 1870's commented that 'man is the Adam of

a modern Eden, primitive in habits and numerically insignificant.' (quoted in Cleary & Eaton, 1992: 8) Rather less poetically, Ridgeway (in Rutter, 1922: x) described present-day Sabah as 'a tropical wilderness; untilled, uncared for, utterly neglected.'. Similar views have persisted until recent times. For example, in the 1950s, Harrisson (1959b: 141) wrote '75% of Sarawak's land surface is still virgin jungle, never controlled by man.'

From quotes such as these, it is apparent that the place of people in Borneo's landscape has been assumed to be a marginal one. The various nomadic peoples who live here have generally been regarded as benign users, living in harmony with their landscape (Rambo, 1985; Redford, 1981). As Brosius (1986: 173) describes with respect to the Penan, the popular view has been 'of a people who wander endlessly, perhaps aimlessly, through the trackless depths of the forest in search of food'. Thus, they have been regarded as a people who tread lightly on their environment, and consequently, as having had little, if any, impact on the landscape. This has partly been because such peoples have been regarded more as a part of nature than of civilisation. Early explorers and colonisers of Borneo tended to depict nomadic peoples as 'other-worldly, unknown, dangerous, close to nature and primitive' (King, 1993: 16). Similar views are also to be found today. Rousseau reports that nomadic peoples are 'generally seen as animal-like and pre-human' by neighbouring agriculturalists (Rousseau, 1990: 72), while those in government and urban dwellers usually look down upon such people (Brosius, 1999; King, 1993).

The picture painted of the agricultural societies of the interior of Borneo is somewhat different. While such societies are recognised as having had an impact on their environment, this has widely been assumed to be a destructive one. Thus, they have been accused of destroying tracts of forest through the practice of swidden agriculture (Sorensen, 1997). These societies are not recognised as having had any role in shaping the forest itself. Rather, this is seen as existing in spite of their actions. Such views have arisen out of a lack of understanding of many of these systems, further encouraged by cultural bias. Thus, in colonial times, and still persisting today, swidden agriculture has widely been regarded as a simple and backward system (Cramb, 1989). For example, Hose & McDougall (1966: 98), describing swidden agriculture in central Borneo in 1912, write that 'the preparation

of the land is everywhere very crude'. A view common within the colonial government of Sarawak was typified by Smythies (quoted in Cramb, 1989: 32), who wrote in 1949 that '[swidden] farming is irrational and there is little evidence of planning for more than one year ahead', also describing this system as 'haphazard, irrational, magic-controlled farming'. Today, it is still often perceived to be a primitive method of cultivation, in need of development and the introduction of modern techniques. Furthermore, swidden agriculture is commonly thought to be wasteful of natural resources, particularly by governments and foresters, who are interested in timber resources (King, 1993: 170-171).

As I highlighted in chapter one, the view of a wilderness forest, with which people either live in harmony, or destroy, has arisen in part from the predominant western conceptualisation of nature and culture as separate entities (Fairhead and Leach, 1996: 5-7; Gomez-Pompa & Kaus, 1992). One consequence of this has been that, typically, ecologists have sought an untouched landscape against which the effects of man (which are assumed to be detrimental) can be assessed. Thus, until recently, the forests of Southeast Asia have been imagined as 'a fragment of some vast unchanging past', rather than as 'an environment in which humans have been instrumental' (Ellen, 1999b: 92). Reflecting this, much of the early research on the ecology and human ecology of Borneo 'focused on... the presumably pristine in nature' (Padoch & Peluso, 1996: 1).

Advances made in the field of historical ecology have questioned these ideas. In particular, such studies have produced evidence to suggest that much, if not all, of the biosphere has been affected by human activity, and furthermore, that people do not necessarily have a negative impact on their environment. For example, some studies have found that people's actions may result in an increase in biodiversity (Balée, 1994: 165) or promote forest establishment (Fairhead & Leach, 1998: 187; Posey, 1985). Evidence to support these ideas has been mounting, with researchers drawing on data from the fields of archaeology, palaeobotany, anthropology and ecology. I now turn to some of the evidence from Southeast Asia, and in particular, Borneo.

Archaeological research has provided evidence for the long history of people in the forests of Southeast Asia. In Borneo, the presence of man is indicated by deposits dating back at least 30,000 years, and possibly as early as 40,000 years (Bellwood, 1985; Cranbrook, 2000; Mackinnon et al., 1996: 55). However, it is thought that people did not move into the interior until about 4,500 years ago with the settlement of Austronesian peoples throughout Borneo (Bellwood, 1985; King, 1993: 77). Cultural traits of these peoples included the making of pottery and the practice of secondary burial, sometimes in jars, practices found among some Borneo peoples until the mid-20th century. Consequently, ceramic finds, and burial remains, in particular necklaces, tools and megaliths, have proved a rich source of data for much of man's history in central Borneo (Arifin & Sellato, 1999; Bellwood, 1985; Harrisson, 1958, 1962; Harrisson & Harrisson, 1970; Rousseau, 1990), although the island remains poorly investigated archaeologically. As well as the archaeological record, other valuable sources of information are oral histories and genealogies (Eghenter, 1999; Sellato, 1997; Vayda, 1981). These have highlighted the prevalence of migration in the histories of many Borneo societies, further suggesting that little of the island's forest has been unaffected by man (Eghenter, 1999; Rousseau, 1990).

For much of the region's history, people's impact on the environment was probably relatively minor. However, with new technologies (such as iron tools, found in Borneo from about 2,000 years ago) and growing populations, human influence increased (King, 1993). Furthermore, this impact has been cumulative. Thus, the effect of even subtle interactions, conducted over centuries, has been magnified. Consequently, because of the long history of farming, hunting, manipulating and managing resources, it is likely that people have had a profound effect on the forests of the region (Ellen, 1999b; Padoch & Peluso, 1996; Rambo, 1985). The ways in which people have influenced the forest can be deduced from studies of the subsistence activities of contemporary societies, as I will describe in more detail later in this chapter (Chin, 1985; Colfer et al., 1997; Ellen, 1999a; 1999b; Padoch et al., 1998; Puri, 1999; Sorensen, 1997).

Both deliberately and inadvertently, people have been a major influence in shaping the forests of Borneo. As Schneeberger (1945: 560) commented, very perceptively for his times, '[a]lthough practically the whole country is covered with jungle, it is

not all the true virgin jungle... it may appear to the newcomer.' Rather than Borneo being a wilderness, it is increasingly evident that 'probably no part of... [Borneo's] forests in at least the last century or two has been left untouched by local forest managers and users... Borneans have not only slashed, burned, hunted, and harvested, they have also manipulated and managed animal and plant populations in ways often subtle and invisible to the scientist's or traveller's eye.' (Padoch & Peluso, 1996: 2)

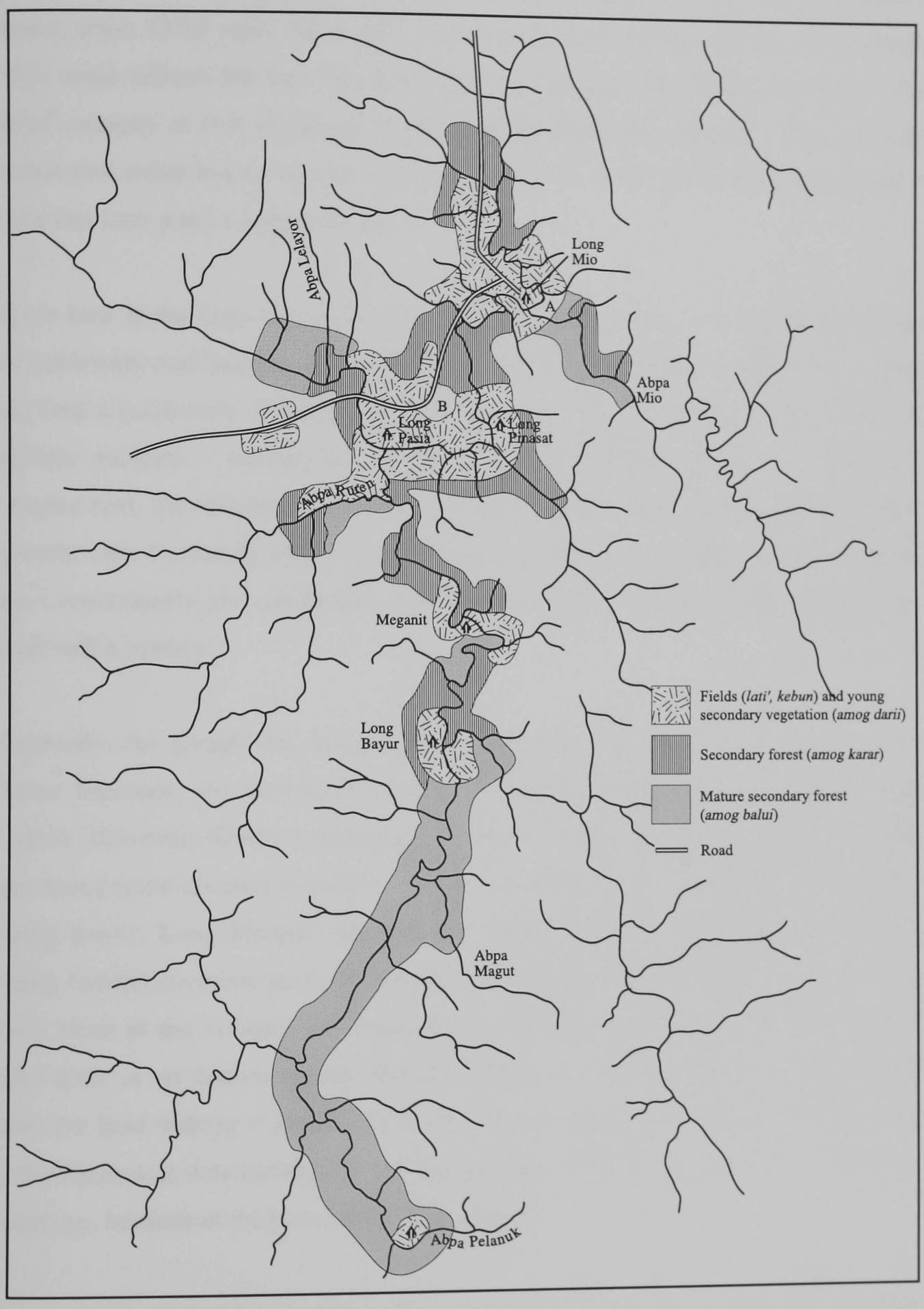
My own research provides further evidence to support this. Previously, in chapter two, I described the agricultural system of the Lundayeh in Long Mio and Long Pasia today, and the ways in which they use and manage their forest resources. I also described the history of these two settlements, highlighting the important role of movement and migrations. This would suggest that the Ulu Padas landscape is one that has been profoundly influenced by the people who have lived there. Let us consider the evidence for this.

4: 3: 1. Farming the forest

From investigating the history of land-use in the Ulu Padas, together with observing present day subsistence practices of the Lundayeh, the likely influence of people on the landscape can be deduced. I begin by describing the land-use history of the region. This was explored through conducting mapping exercises, and also, less formally, by recording people's accounts of the land's history. People often related these to me spontaneously as we passed through the landscape, or occasionally such conversations were prompted by me. This information is depicted in figure 4.1. Marked on the map are past and present settlement sites, and the classification of forest types. These require some explanation.

Forest is referred to as *fulung*. More generally, this term is used for all vegetation types outside of the village and fields. Within the category of *fulung* are recognised a number of stages of regenerating forest. The first of these (taking a swidden field as the starting point in a temporal sequence) is *amog darii*. This translates as small (*darii*) secondary vegetation (*amog*), and ranges from one year old fallow fields, which are covered with scrubby vegetation, to ten year old vegetation, by which time

Figure 4.1: Land-use history in the Ulu Padas



small trees dominate. As larger trees develop the vegetation is referred to as *amog karar*, *karar* meaning large. Such forest is between 10 and 20 years old. More mature forest, some 20-50 years old, is called *amog balui*. *Balui* means change, or changing. This name reflects the fact that this forest is changing into old-growth forest. The final category is that of *fulung karar*, large (*karar*) forest (*fulung*). This includes forest that either has no history of land-use, or, if it is known to have been cleared, then this took place a long time ago.

If we look at the map, we can see that the pattern of forest types reflects the history of settlement and land use in the Ulu Padas. In the immediate vicinity of the village we find a patchwork of fields – hill rice, wet rice, vegetable and coffee fields, and buffalo pastures – interspersed with young fallow vegetation. As I described in chapter two, the villages of Long Pasia and Long Mio have been located on their present sites for nearly fifty years, with some earlier settlements also situated close by. Consequently, the surrounding land has been the site of agricultural activities for over half a century.

Typically, the greater the distance from Long Mio and Long Pasia, the older the forest becomes, this broadly reflecting the history of people's movements in the region. However, there are exceptions. Areas of fields and young secondary forest are found some distance from the villages. These occur at the satellite settlements of Long Bayur, Long Pinasat, Abpa Ruren, Meganit and Abpa Pelanuk, these sites being farmed in recent years. In contrast, some areas of old-growth forest are found very close to the villages. For example, on the hillside across the river from Long Mio there is no known history of forest clearance, as large boulders are scattered over the land making it unsuitable for agriculture (area A on the map). Near to Long Pasia there is an area of heath forest that has never been cleared, at least within living memory, because of the poor sandy soils (area B).

It is apparent from the map that much of the forest of the Ulu Padas has, at one time, been cleared for agriculture. The effects of swidden agriculture on the environment are well-documented (Conklin, 1957; Kunstadter et al., 1978; Rambo, 1985). Swidden agricultural practices create a patchwork of forest at different stages of

regeneration. This increases the overall diversity of the forest and also influences species distribution because of the creation of a range of habitat types.

As well as these obvious effects on forest structure, swidden activities have more subtle effects, for example, on forest composition. Consequently, the forest that grows back is not the same as the forest that would have been there without agriculture. This is for a number of reasons. For example, soil ecology is changed because of the effects of soil erosion following clearance, and changes in nutrients and soil structure following burning and cultivation (Rambo, 1985: 63). Agricultural activities also influence species distribution, of both plants and animals. Selective felling affects the distribution of certain tree species. For example, trees that are difficult to fell, such as mature hardwoods, may be left, as may the trees of favoured fruit species (Ellen, 1999b: 93; Fried, 2000: 219-220; Rambo, 1985: 68). In the longer term, this will serve to enrich the subsequent forest in these species. The distribution of animals is influenced because of their preferences for particular habitats. For example, many animals, including deer, boar and monkeys, are attracted to fields and young secondary vegetation because these are a rich source of food (Caldecott, 1988: 81-82; Dove & Kammen, 1997: 97).

That the Lundayeh have been influencing the forest in such ways is apparent from my observations of the interactions between people and the forest. For example, selective felling is undertaken at various stages in the process of swidden cultivation. The first stage at which this can occur is in deciding which area of land to clear for new fields. For example, on one occasion a piece of land was rejected as a site for cultivation because there were a number of good timber trees growing there. For this reason, it was decided better to wait a few more years before clearing this land, at which time it was thought that the timber would also be needed.

The time when selective felling is most apparent is during forest clearance itself. Occasionally, when the forest is being felled, trees of valued species are left standing. For example, in the middle of a field near to Long Pasia stands a large tree of *Castanopsis psilophylla*, the source of the fruit *bua ukem*. The owner of this field told me that he had decided to preserve this tree because the fruits are so good. Saving single trees is not very common, because trees left standing in the middle of a

field overshadow the rice, so reducing the yield. It is more common to leave a patch of forest that includes the favoured resource. More subtly, a decision may be made not to extend a field quite so far, if this means saving some particularly valued resource, perhaps fruit trees, timber trees or sometimes rattans.

Some resources are saved by transplanting, rather than by selective felling. For example, the seedlings of fruit trees encountered while clearing a field may be saved, and these transplanted in the village or in orchards. I observed people uprooting seedlings of *bua lingat* (*Lansium domesticum*), *bua felam* (*Mangifera* sp.) and *bua pugi* (*Baccaurea macrocarpa*) for this purpose. Planting around villages and enrichment planting in fallows are common activities. Fallows are not simply left to themselves, but sometimes are managed, albeit at a low level. Thus, in the first few years of a fallow, certain species may be planted. Most commonly fruit trees are planted, in particular, durian (*Durio* sp.), *bua lagka* (*Artocarpus heterophyllus*) and *bua lam* (*Mangifera indica*). In later years, these will continue to be tended, with weeding or pruning. Self-seeded species may also be managed in this way, if they provide useful resources.

That such activities have long been carried out by people is indicated by the presence today of many fruit trees at old village and field sites. Many of these trees are either known to have been planted by people's ancestors, or those for which no history is known are often presumed to have been planted. Indeed, clusters of fruit trees have been found to be good indicators of past human presence in an area, and are widely recognised as such by local peoples (Ellen, 1999a; Fried, 2000; Peluso, 1996; Peluso & Padoch, 1996; Puri, 1999).

Another way in which people influence species distribution is through the introduction of new species or varieties of crop (Ellen, 1999b: 94; Rambo, 1985: 71). Through this process, the 'flora of Borneo, especially the assemblages of agricultural plants..., has been enriched with many species' (Padoch & Peluso, 1996: 4). This can be inferred both from present-day cultivation practices, and from the presence of crops of exotic origins in people's fields. For example, the Lundayeh (in common with other Bornean societies) have grown tobacco, corn, cassava and chillies for as long as anyone can remember, but these crops are of New World origin. Other exotic

crops that are grown include the sweet potato, also from the New World, as well as crops of African origin, such as peanuts and the bottle gourd (Boomgaard, 1997; Christensen & Mertz, 1993).

The Lundayeh have a long tradition of experimenting with new cultivars and crops, and seed exchange and testing of new crops remains a common preoccupation of people today. On visits to other villages, people often return with new types of seed. People also experiment with seed or crops bought at the markets in town. In the year that I was there people had planted grapes, apples and watermelons for the first time, these with limited success, as well as cultivated varieties of indigenous fruits, such as durian, rambutan and langsat.

Through these various activities, of selective felling, transplanting, and cultivation, the process of forest regeneration is manipulated and altered. Thus, we can see how such activities in the past must have shaped the forest that we see today, influencing species distribution and genetic diversity.

Many descriptions of swidden agriculture have focused entirely on the process of rice cultivation, i.e. the clearing of fields and production of rice, ignoring the role of fallows in this system. Such a snap-shot vision gives a mistaken impression, and has contributed to the view that swidden cultivation is a destructive system (Fried, 2000; Padoch et al., 1998). Swidden agriculture needs to be understood as a longer-term process. Thus, it involves not only forest clearance and cultivation, but also the management and manipulation of fallows (de Jong, 1997; Gomez-Pompa & Kaus, 1992; Peluso, 1996). In such a way, a landscape is created that is profoundly influenced by man. For some researchers, this is best described as a managed landscape (Colfer et al., 1997; Fried, 2000; Lawrence et al., 1995; Peluso & Padoch, 1996; Sorensen, 1997), and swidden agriculture best described as forest farming (Kunstadter et al., 1978; Wadley et al., 1997).

I talk later in this chapter about whether the agricultural system of the Lundayeh can be described as forest management, addressing the issue of just what is meant by the term 'management'. What is undoubted from the preceding account, is that the

Lundayeh have had a profound impact on the Ulu Padas environment through their agricultural activities.

4: 3: 2. Using the forest

It is not only through their farming activities that people have an impact on the environment. The use of forest resources, including hunting and fishing, can also be significant. This is illustrated by the examples I gave in the preceding section of two patches of old growth forest which occur very close to Long Mio and Long Pasia. The close proximity of these areas of forest to the villages means that they are a frequently used source of forest products. For example, the heath forest near Long Pasia is the source of a range of edible plant resources, such as *pau sia* (*Stenochlaena palustris*), *busak pelanuk* (*Bromheadia finlaysoniana*), *wei sia* (*Daemonorops fissa*) as well as various mushroom species. It also provides several medicinal resources, including *angang* (*Myrmecodia* sp.), an ant plant only found in heath forest. The hillside across from Long Mio is a valued source of rattans, in particular *wei seseit* (*Daemonorops longistipes*), and is also a popular hunting site.

Although these areas of forest have never been cleared for agriculture, in no way can they be considered 'pristine' or 'virgin' forest. The influence of people on the forest here, although subtle, has been pervasive. For example, both these forest patches are criss-crossed by numerous trails, created by people as they collect plant resources or go hunting. These trails form a distinct microhabitat within the forest, and so influence species distribution. Furthermore, in using plant resources, people have had an impact on their abundance. For example, people told me that certain rattan species are now rare in the forest near Long Mio because of over-harvesting. Similarly, hunting has had an impact on animals, influencing their behaviour and distribution. For example, deer found near the villages rarely respond to someone mimicking their calls (a common strategy when hunting, used to attract the deer), apparently because they have grown accustomed to this.

It has been suggested that the collection of forest resources has been a significant selection pressure in the forests of the Malaysian peninsula (Dunn, 1975; Rambo,

1979). It seems likely that this is also true in the Ulu Padas and throughout Borneo. Let us consider the evidence for this in a little more detail.

The act of harvesting plant resources influences the growth and form of species, and their distribution (Rambo, 1985). Some species may become less abundant, as with the rattan species near Long Mio mentioned above. High-quality timber trees have also been depleted near the villages. Harvesting of other resources can promote their growth, and so increase their abundance (provided harvesting is not too intensive). For example, harvesting bamboos and some rattan species, such as *wei sia* (*Daemonorops fissa*) and *wei peit* (*Calamus pogonacanthus*), encourages them to send out more shoots, so encouraging the establishment of thickets of these plants.

People also influence the reproductive biology of species, although these effects are not always easily discerned. For example, collecting the flowers of *Bromheadia finlaysoniana* (*busak pelanuk*, used as a vegetable) presumably affects the reproductive success of this species. However, it is still abundant locally, perhaps because of its ability to reproduce vegetatively. The collection of fruits also has an impact on the reproductive biology of species. People may destroy the seeds through eating them, or alternatively, they may help distribute them, for example, by eating the fruits and discarding the seeds (Ellen, 1999b; Padoch & Peters, 1993; Rambo, 1985). Puri (1999: 2) noted that at recently abandoned forest camps of the Penan, the forest floor was carpeted with seedlings germinating from discarded fruit seeds. Near Long Mio and Long Pasia there are patches of *bua bisian* (*Salacca vermicularis*) dotted around the villages. On occasion, I observed the aftermath of fruit collecting trips to these palms, with fruit debris scattered around the trees. Such observations suggest that people (and in particular, children) have had a role in creating patches of this palm.

Clearly, hunting activities have an impact on animal species, affecting both their behaviour and abundance. People report that animal numbers are in decline, although it seems likely that habitat loss from logging activities in the region has been a more important factor in this than the hunting activities of local people. Hunting does not just impact on animal numbers, but also has more subtle effects on the forest, for example, through the creation of hunting trails. The Lundayeh also establish camps

in the forest for use during hunting expeditions. Some of these are used on repeated occasions, and so are quite well-established. These camps influence the forest structure, since the undergrowth is cleared and, sometimes, small trees are felled. Thus, small clearings are created, in which more light-demanding species thrive (cf. Ichikawa, 1996: 473). Other species, such as fruit trees, may be encouraged at these sites, as in the example cited above of Penan forest camps (Puri, 1999) and also in trailside vegetation.

Fishing activities also impact on the environment. In the past, fish poisoning was employed, a method that would have affected the river ecology, albeit only locally (Rambo, 1985). Today, poisoning is no longer carried out, but electricity is occasionally used, a method that has a significant impact on fish populations. More commonly, fishing lines or nets are used. Although these methods are less invasive, because of the large numbers of people involved they have had a noticeable impact on fish numbers. Thus, the rivers near the villages yield much smaller catches, and also smaller fish, than those further afield.

From this account, the diversity of ways in which the Lundayeh influence their environment is clearly apparent. Consequently, it is impossible to describe the Ulu Padas environment as a wilderness. This brings us to the question of what, if anything, we can call a 'wild resource'. As Posey highlighted, in recognising the anthropogenic qualities of landscapes 'the assumption that... traditional resources are "wild"' can be dismissed (Posey, 1998: 115).

4: 4. Cultivated forest foods and wild crops

The concept of 'wildness' is a problematic one, since it implies that the resource, be it a plant or animal, has been unaffected by humans. However, it is often difficult, if not impossible, to determine whether this is the case. Thus, what appears to be a wild resource may in fact have been subject to management or manipulation by people.

In the preceding sections I described the various ways in which the Lundayeh manage, manipulate and interact with plant and animal resources. This makes clear the difficulty in applying the terms 'wild' or 'cultivated' to many of these resources.

The impact of the Lundayeh on the landscape further blurs the distinction between wild and cultivated. If a plant grows in a habitat that has been greatly influenced by people, can we consider this to be truly wild? Many 'wild' foods are found in habitats created as a result of agricultural activities, such as fallow fields. For example, many of the weedy species used as leafy vegetables (such as *bata* (*Elatostemma* sp.) or *keduang* (*Pseuderanthemum acuminatissimum*)) are common in young fallows and also along trails. Similarly, the mushroom *kulat kecep* (*Schizophyllum commune*) is most commonly found growing on burnt logs in fields. A further complication is provided by 'cultivated' plants self-seeding. For example, *ginjer* (*Limnocharis flava*) was apparently introduced to the area some time in the last decade when someone brought the seeds from the lowlands. Since then, this plant has spread, and despite the fact that it is no longer sown, it is widespread in many of the wet rice fields. Self-seeding is also common for cassava, yams, mustard greens and *Citrus* fruit trees, to name but a few.

The problem of defining what is wild is not exclusive to plant resources, but also exists for animals. This is apparent from the existence of tilapia in the rivers around Long Mio and Long Pasia. These fish were introduced into fishponds by the villagers, but have escaped and are now common in the rivers. The case of forest animals would seem to be more clear-cut. In New Guinea feral pigs are thought to have had a significant impact on both wild and domesticated pig populations (Rappaport, 1968). However, in Borneo, although pigs of mixed descent (i.e. of domestic pig and wild boar) have been reported in the interior (Rousseau, 1977), there are apparently no large feral populations (Caldecott, 1988). Certainly in the Ulu Padas this is unlikely, at least in recent years, because the population of domestic pigs is very small, and these are kept in enclosures. In the past, the situation could well have been different, as I was told that people used to keep many more pigs and these roamed freely. It would also seem likely that in situations of warfare and conflict, domesticated animals could well have been abandoned or escaped into the forest.

4: 4: 1. Defining 'wild' and 'cultivated'

Domestication is usually defined as the process by which plants or animals undergo genetic change in response to their manipulation by man. Cultivation refers to the sowing or planting of crops in cleared and tilled land, and this may be of domesticated or undomesticated crops (Etkin, 1994: 3). 'Wild' resources are often defined merely by default, i.e. as those resources that are neither domesticated nor cultivated. Such a definition of 'wild' is problematic, implying as it does that the resource, be it a plant or animal, has been unaffected by man. However, included within this category would have to be all those resources that are managed outside of 'cleared and tilled land', and those influenced by humans in other ways. As I have described for the Lundayeh, people interact with and manipulate plants and animals in a variety of ways. Given that many of these interactions influence the ecology, evolution and genetics of these resources, such a dichotomy does not reflect biological reality (Alcorn, 1981).

It has long been recognised that a simple division between wild and cultivated or domesticated resources is overly simplistic. Indeed, as early as 1950, Lévi-Strauss made the point that 'there are many intermediate stages between the utilization of plants in their wild state and their true cultivation.' (Lévi-Strauss, 1950: 465) This dichotomy can be traced back to ideas from the beginning of the 20th century, in particular, to those of Engels (1934). It was Engels who coined the terms 'food collection' and 'food production', food collection referring to foraging and extraction activities, and food production to the cultivation and husbandry of plant and animal resources. He regarded the latter as 'the singular achievement of human agriculturalists and pastoralists' (Ingold, 2000: 78), so drawing a clear distinction between hunting and gathering and agriculture.

Such a view has continued to be influential, in particular, shaping ideas regarding the emergence of agriculture. Thus, the transition to agriculture was presumed to have been an abrupt event (Harris, 1989). In the 1960s, this view began to be undermined with the integration of ecological and evolutionary ideas, and the subsequent development of complex models of the processes of cultivation and domestication. These stressed the continuities between hunting and gathering and agriculture, and similarly, between 'wild' and 'cultivated'. In these models, wild and cultivated

resources were described as the two extremes of a continuum, in which various stages of interaction and manipulation of resources were recognised. For example, Harris produced a model in which four stages of people-plant interaction were proposed, based on the amount of human energy input: wild plant-food procurement; wild plant-food production; cultivation; and agriculture. Cultivation was defined as the planting or sowing of undomesticated crops in cleared and tilled land, and agriculture as the cultivation of domesticated crops (Harris, 1989).

Researchers from other fields have also contributed to this topic, and suggested alternative categories and terminologies. For example, the botanist Clement proposed the following terms to describe plant resources: domesticated, semi-domesticated, cultivated, managed and wild (described in Dufour & Wilson, 1994: 115). Semi-domesticated resources were those which had undergone some kind of genetic change, while domesticated resources had been so significantly modified that they had become dependent on humans for their survival.

The term 'semi-domesticate' has also been used in a different sense. For example, Posey investigated the subsistence system of the Kayapó people of Amazonia. Subsequently, he suggested that the term 'semi-domesticated' be applied to those plants that are subject to human manipulation but that are not domesticated or cultivated. As Posey explained, he used this term 'to emphasize that most plants used by the Kayapó are NOT domesticates, nor are they "wild"' (Posey, 1990: 55).

There are problems with this terminology, since the term 'semi-domesticate' is more commonly used in the sense of Clement, to suggest that genetic changes have taken place, rather than to a 'casually tended, but important, plant' (Alcorn, 1981: 400). Furthermore, Posey makes no distinction between those resources that are consciously manipulated (i.e. managed) and those influenced inadvertently. I would hold that the consciousness, or otherwise, of people's actions is significant, as I discuss later in this chapter.

Etkin & Ross (1994: 88) proposed the additional term 'semi-wild' to refer to plants 'neither explicitly cultivated nor actively tended, but nevertheless affected by human activities'. This term was coined in recognition of the profound effects that people

had had on the environment where they were conducting their research in Nigeria. As they explain, '"Semi-" is about as wild as plants can be in this densely populated, intensively farmed part of Hausaland.'

In striving to define resources, the category 'semi-wild' would seem a useful one to refer to those resources that are influenced by people, but unintentionally so. This would be in addition to the categories of domesticated, cultivated and managed. Thus, in the case of the Lundayeh, 'semi-wild' resources would be those found growing in fallow vegetation, or that have been subject to some disturbance by people, but unintentionally so. 'Managed' resources would be those that had been consciously manipulated, for example, the many fruit trees that are transplanted or protected.

The problems in trying to classify resources as 'wild' or 'cultivated' partly reflect the difficulties of trying to describe a complex system in terms of simple categories. However, it is also more than this. These problems are also a reflection of the fact that often there is no clear dividing line between cultivation and extraction activities. Thus, hunting can merge into husbandry, and vegetable gathering into farming (Brosius, 1991; Ellen, 1999b). In swidden agricultural systems it is particularly hard to make clear distinctions, since fields and forest merge into one another (Alcorn, 1981; Chin, 1985; Colfer et al., 1997; Dove, 1985).

Putting debates over terminology to one side, what is clearly important is that there is recognition of the complex ways in which people interact with and manipulate their environment and the resources within it. In giving full recognition to the diverse ways in which the Lundayeh influence their resources, it seems increasingly difficult to know what, if anything, can be called 'wild' or 'cultivated'. However, that there are differences is undoubted. Cabbages and beans are certainly different from palm stems and fern tips, as is the wild boar from the domesticated pig, and they are treated as such by the Lundayeh.

4: 4: 2. The Lundayeh view

There is no equivalent word in the Lundayeh language for 'wild' in the sense that it is being used here, i.e. to describe a resource or landscape that has been 'uninfluenced by human manipulation' (Posey, 1990: 55). The nearest equivalent is *fulung*, which means forest. As I described earlier in this chapter, the term *fulung* covers a range of vegetation types, including old-growth forest, secondary forest, and riverside vegetation. Thus, it is used to describe plant foods from all these sources, as well as hunted game. Such foods are referred to as *kikid fulung*, forest side-dishes.

That the Lundayeh distinguish 'forest' resources from cultivated or domesticated resources is suggested by differences in the ways that these foods are shared and by their role in the diet. People's attitudes to these foods further imply that such a distinction is made. Thus, during the dietary surveys, it became apparent that people view these foods differently from cultivated and domesticated foods. People often expressed embarrassment at eating *kikid fulung mo* ('just forest side-dishes'). This is, perhaps, a relatively recent phenomena, because of people's increased contact with urban life and awareness of other lifestyles. Consequently, they do not wish to be regarded as people that are dependent on forest resources, because of the widespread perception that this is a backward way of life. As I highlighted in chapter three, the attitudes of the Lundayeh towards forest foods are ambiguous, for example, many people have strong preferences for some forest foods, and hunted meat is highly regarded. However, what this example illustrates is that the Lundayeh do conceive of 'forest foods' as a distinct category. This is in contrast to the observations of other authors, such as Colfer, who suggested that no such distinction is made by the Uma' Jalan people of Kalimantan (Colfer et al., 1997: 28).

That a distinction is made between forest and cultivated foods is more apparent from the fact that forest foods are never eaten at *irau* (feasts). On such occasions, a domesticated animal is slaughtered, and if vegetables are served, these are cultivated vegetables. Among the Kelabit, *irau* are conducted in a very similar way. Janowski, in her analysis of meals and patterns of food sharing, suggests that for the Kelabit 'there is no clearcut separation between the nature of domesticated and wild animals' since animals killed at *irau* 'are considered to be associated with the forest, that is, with wild food.' (Janowski, 1993: 658) I would dispute this. Certainly for the

Lundayeh, domesticated animals are viewed differently from wild animals. This is because of the time and effort spent in rearing these animals, something that invests them with value. Consequently, it is unacceptable to provide hunted meat or non-cultivated vegetables at *irau*.

In the same analysis, Janowski suggests that wild and cultivated plant foods are perceived in the same way by the Kelabit. Thus, she states that cultivated plants are 'treated as though they were wild' (1995: 99) because they are all freely shared. This is in contrast to rice, which is explicitly owned by a household, and not usually shared with those from other households. Certainly, among the Lundayeh, as with the Kelabit, all foods served as side-dishes (*kikid*), whether they are cultivated or from the 'forest', are usually freely shared[10]. Thus, it is common to observe children in the early evening carrying bowls of cooked side-dishes to the houses of their neighbours or relatives. Uncooked foods are similarly shared, for example, bundles of vegetables, fruits, recently caught fish or portions of meat, are given to friends and neighbours. Alternatively, people are invited to help themselves to vegetables growing in the fields. However, this is where the difference lies, since people must always be invited to do so. They cannot just help themselves to someone else's cultivated vegetables or fruits. This observation clearly indicates that some recognition is given to people's cultivation activities. Thus, the time and effort invested in cultivated plant foods means that they are treated slightly differently from forest resources. This is most apparent in the case of rice.

As I touched on above, rice is never shared by people from different households, at least not on an everyday basis. Every household cooks its own rice, and its members eat together. People are generally unwilling to eat the rice of others. For example, when working together in the fields, people bring their own rice and *kikid*. Although the *kikid* are freely shared, people show great reluctance to accept the rice of others.

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[10] During the year of fieldwork patterns of food sharing were changing, with people becoming less inclined to share cultivated vegetables. This is because people began to sell many of these, both in the logging camps and within the village. Not surprisingly, because of their potential monetary value, people became less willing to give these away, even to close relatives. Similarly, there has been a decline in the sharing of hunted meat because of its monetary value, although this began a number of years earlier. There still exist strong social obligations to share meat, and so, even when meat is being sold, usually some is reserved for close relatives.

Thus, it would seem that rice is perceived differently from other foods. This is because it involves so much labour and care to ensure that it grows successfully and bears fruit. Many other crops are simply sown, and the seeds left to grow. These crops are said to be able to 'live on their own' (*mulun sebuleng*), unlike rice which requires the intervention of people. The same distinction, between rice and other crops, is apparently made by the Kelabit (Janowski, 1995: 99) and also the Kantu' (Dove, 1985: 159). Such a distinction would seem to correspond with Clement's classification of resources, outlined above, in which domesticated resources are those that have become dependent on humans.

In conclusion then, it seems that the Lundayeh distinguish between domesticated, cultivated and forest resources. However, this is largely a pragmatic distinction, the degree of cultivation or management of a resource being reflected in rights to ownership. Indeed, such a link, between ownership and the investment of labour in the management of a resource, has been widely recorded (Appell, 1991; 1995; Fairhead & Leach, 1998; Michon et al., 2000; Peluso, 1996).

If, as it seems, ownership reflects the role that people are perceived to have had in managing a resource, I would suggest that the Lundayeh do not regard forest resources as wild. This is implied by the rules or etiquette governing access to forest resources, since none are entirely open-access. Those resources found growing in secondary forest are 'owned' by the individual who originally cleared this land, although access is always granted for other villagers' domestic needs. Those resources in old-growth forest within a village's 'territory' (as perceived locally, as this is often not recognised at government level) are regarded as common property resources of all village members. Outsiders are not recognised as having rights of access, but are expected to ask permission of the villagers before using local resources (although this is rarely done nowadays). Thus, according to Lundayeh perceptions, they 'own' the resources in the region, so suggesting that their role in influencing these resources is, at some level, recognised. This brings us back to the question of whether this influence on the forest and its resources can be equated with 'forest management'.

4: 5: 1. Defining forest management

The role of local people in managing their environments has long been overlooked (Fairhead & Leach, 1998; Padoch & Peters, 1993; Sorensen, 1997). The reason for this lies partly in the prevalence of cultural biases. Throughout Borneo, numerous cases have been documented in which local and traditional management strategies have been ignored because of this. For example, Tsing (1993: 156) observed that 'state stereotypes do not allow officials to notice the sophistication of Meratus farming.' Similarly, Padoch & Peters (1993: 174) noted, 'none of the foresters or agronomists who staff provincial or regional government acknowledge that what Tae residents do should even be called forest management.'

One reason for this is that many of the management practices of local people do not fit into the categories used in the formal sectors of agriculture or forestry (Alcorn, 1981; Colfer et al., 1997; de Jong, 1997; Padoch et al., 1998). For example, there is a prevailing view that only cleared and planted areas can be subject to management (Gomez-Pompa & Kaus, 1992; Michon et al., 2000). Local practices are also ignored because of an assumption that nothing can be learnt from local people, often because knowledge from a formal education system is presumed to be superior, and traditional practices are viewed as backward (King, 1993).

Another reason lying behind the 'inherent "invisibility"' (Padoch & Peters, 1993: 174) of many local management systems is that they are not explicit, and so, they are not easily recognised as 'management'. For example, shifting agriculture has been described by a number of researchers as part of a system of forest management (Colfer et al., 1997; Peluso & Padoch, 1996; Sorensen, 1997). However, if the farmers in question regard these agricultural activities purely as a means to produce rice, not acknowledging their role in forest management, can we then call this management? According to one school of thought, that of Balée (1994) and Posey (1998), we should.

A number of authors have suggested alternative definitions of management, largely in response to the realisation that many management systems are not being recognised. Balée (1994: 116) was among the first to question the conventional views of management. Thus, he defined management to be 'human manipulation

of... the environment that brings about a net environmental diversity greater than that of so-called pristine conditions, with no human presence.' One obvious problem with this definition is how to define environmental diversity. Furthermore, many of what would widely be termed management systems do not in fact serve to increase diversity, for example, planting of mono-crops. However, the important point being made by Balée is that management does not have to be conscious. Rather it is the outcome of people's actions that determine whether they can be regarded as part of a management system. Similarly, Posey (1998: 109) has noted that for the Kayapó, many of their actions are not consciously carried out as part of a management plan. For this people, 'the central concepts of ecological management are deeply embedded and codified in myth'. Thus, both Balée and Posey hold that there does not have to be conscious recognition within a society of the impact of their actions for these to be described as management. Rather, it is the outcome of these actions that is important.

Certainly, by placing too great an emphasis on the intentionality of people's actions, researchers have often ignored the various ways in which people influence ecological processes. For example, they have overlooked the 'ways that landscapes might be enriched with trees through the cumulative effect of social processes such as settlement, and the more complex layers of tenure and social institutional control linked to such landscape history.' (Fairhead & Leach, 1998: 179) In broadening the concept of management to encompass these various interactions of people with their environment, much has been done to raise awareness of the validity of different societies' ways of life.

In calling such actions management, researchers are simply interpreting them in their own terms. Although this is not a problem in itself, I remain unconvinced by the arguments of Posey and Balée for two reasons. Most obviously, it raises the question of where you draw the line in deciding what can be called management. Perhaps more significant are the potential problems of not fully appreciating the actual reasons underlying a people's actions. For example, particular practices may be undertaken for religious rather than 'management' purposes. If this is not recognised, this can cause problems if attempts are made to integrate these with other

management objectives, such as those of conservation projects (Eghenter, 2000). I talk more about this issue in chapter six.

I am reluctant to question the application of the term 'management' to activities that are not consciously done as such, because of the implications of this. Most significantly, there is a risk of devaluing these activities and of questioning their soundness. However, this is not sufficient reason to broadly apply the term 'management'. In highlighting that local people do not interpret their own actions in terms of ecological management, this is not to say that such functions do not exist. Indeed, they often do. Furthermore, people may not recognise their own actions as management simply because they have never had the need to interpret them in this way. If forced to consider them, they may come to view them as management (Posey, 1998). However, I maintain that management does have to be conscious to be recognised as such. Moving on from this debate, what is apparent is that researchers have had too narrow a view of what constitutes management. Consequently, the role that many societies have had in manipulating and managing their environment has not been fully recognised. Let us consider what actions of the Lundayeh can be described as management.

4: 5: 2. Management activities of the Lundayeh

One way of defining management is that it is those activities carried out with a strategy for the future in mind. Activities that would fall within such a definition are the cultivation and manipulation of particular resources, since these are carried out in order to increase the abundance or accessibility of useful resources in the future. The Lundayeh cultivate a variety of forest resources, most commonly, fruit trees. As I have described elsewhere, people transplant seedlings of favoured species from the forest, and they plant the seeds of forest species and cultivars in their fields and next to their houses. Some resources are manipulated *in situ*, for example, through pruning or weeding to encourage their growth.

It is easy to overlook the significance of such activities, and not to recognise their value as management strategies. This is partly because they are often undertaken on a small scale, and so, their impact on the forest is not obvious. In addition, it is

sometimes assumed that there is no long-term strategy behind these activities, because many of the resources that are cultivated or manipulated appear to be abandoned after a number of years. In the past, when the way of life was less settled than today, fields and settlements were regularly abandoned. In more recent years, this has declined, particularly as land is coming under increasing pressure, but satellite settlements and fields are still occasionally abandoned. However, although some sites are permanently abandoned, for example, if people move a long distance away, many are not. Furthermore, even if the site is not farmed again, such sites are still valued for their resources, and people will return regularly to harvest these. Thus, although the site may have been abandoned as a place to live or farm, its resources have not been so abandoned. This is apparent from the fact that many of these are still owned. If someone plants a fruit tree, for example, he owns this tree and has the right to harvest its fruits, and these rights are passed on to all his descendants. These rights exist for as long as there is someone who can remember and claim these. Many of the fruit trees found in the region today are owned by particular families.

These kinds of activities, of planting and manipulating plant resources in settlements and in old field sites, merge into more overt management strategies to create agroforests and orchards. Increasingly today, the Lundayeh of Long Mio and Long Pasia are planting and encouraging fruit trees in fallow vegetation in order to develop fruit orchards. The manipulation of fallows to create agroforests or orchards has been documented in a number of Borneo societies. For example, by sowing rattan seeds in their fields at the time of rice cultivation, the Bentian people of East Kalimantan create rattan forests (Fried, 2000). In West Kalimantan, the Bagak practice 'a kind of cyclic swidden-fallow agroforestry', in which some fallow fields are planted with fruit trees and rubber, and these then become managed forests (Peluso, 1996: 517). Similarly, the Tara'n of West Kalimantan plant ironwood trees (*Eusideroxylon zwageri*) in fallow fields, so demonstrating incredibly long-term planning, since these trees take a hundred years to reach maturity (Padoch et al., 1998).

The activities of the Lundayeh pale into insignificance by comparison. This is partly because such activities are a fairly recent development, the Lundayeh having no tradition of developing agroforests. This shift towards more intensive cultivation of

fruit trees has been prompted by changing circumstances, with increased pressure on land, declining availability of many forest resources, granting of permanent land titles, and improved access to markets for sale of fruit. Indeed, similar factors seem to have been responsible for the expansion of such activities among other Borneo peoples, including the examples cited above. However, in these cases, such a shift took place many decades earlier, and so, their agroforestry systems are now well-established (Michon et al., 2000; Peluso, 1996).

The reason for highlighting this is that it illustrates the important point that even if people do not employ explicit management practices at a particular time, this is not to say that they are incapable of doing so. Rather, it may simply be that there is no need. When circumstances change, for example, with a declining resource base, management institutions may be implemented. Thus, among the Lundayeh, as well as developing fruit orchards, people are now cultivating a number of resources that are becoming increasingly difficult to find in the surrounding forests, such as *afa' fulung* (*Albertisia* sp.) and some species of rattan.

Finally, I come to the question of the significance of shifting agriculture as part of a system of forest management. Researchers working elsewhere in Borneo have suggested that the systems of shifting agriculture they encountered are an integral part of forest management. The main justification for this has been that it is the agricultural system that creates and maintains a diversity of forest types, thus ensuring the availability of a wide range of resources (Colfer et al., 1997; de Jong, 1997; Lawrence et al., 1995; Peluso & Padoch, 1996). This is also true for the Lundayeh, as the data on their food resources and diet illustrates. Furthermore, this role is acknowledged by the Lundayeh themselves, who are fully aware that by practicing shifting agriculture they are also shaping the forest, and thus, are ensuring that they will be able to eat a diversity of *kikid* for example. Shifting agriculture can also be seen as fundamental to forest management because it provides the basis for the traditional system of land tenure. It is through clearing 'primary' forest that ownership over land is established. This then determines rights of access and the pattern of forest use (or at least it did in the past) (Sorensen, 1997). The role of land tenure in regulating forest and resource management is what I now turn to.

4: 5: 3. Rights to land and resources

There are two kinds of resource rights: rights to land, and rights to the resources on that land. Traditionally, for the Lundayeh, in common with many other Borneo peoples (Appell, 1986b; Rousseau, 1990) rights to a territory were held by a longhouse (Deegan, 1974). Within this territory, any longhouse member could clear the forest to make a swidden. If an individual cleared a patch of forest which had no known history of clearance, he and his descendants could lay claim to this land. They had the right to farm this land, for as long as they wished, or rather, for as long as there existed someone with the knowledge that this was their land. Such a system, known as 'devolvable usufruct' (Appell, 1995), was the system of land tenure for the Lundayeh until recent years.

With the implementation of government legislation on land tenure, this system has gradually been undermined. Under the Sabah Land Ordinance of 1930 all land is, by default, the property of the state. An individual (who is a native of Sabah) can apply for Native Title, up to a maximum of twenty acres. Applications must be made to the Department of Lands and Surveys, which has the mammoth task of deciding on the legitimacy of claims, resolving conflicts, and surveying the land. Not surprisingly, applications typically take years to approve. Today then, there exists a mix of the two systems, with people applying to the government for land on the basis of their traditional rights. All of the land in the Ulu Padas is either under application or has title, and so there is no way of making new land claims according to the traditional system.

The traditional system of land tenure gave the owner rights to cultivate this land, to the exclusion of anyone else. Earlier in this chapter, I outlined the system governing rights to the resources on this land. To recap, such resources were open access to other community members, so long as they were being harvested for domestic consumption. The exceptions to this were particularly valuable or scarce resources, for example, timber trees or damar resin from *Agathis* trees. Those resources found in forest to which no-one had any claim were regarded as the common property of all village members, i.e. to the exclusion of outsiders.

Today, this system still exists, but it is weakening. Thus, when someone comes into an area, they are expected to ask the village headman for permission to enter the forest, whether this is to harvest plant resources, go hunting or fishing. However, today this is often not done, since the rights of the village to the resources in their region are no longer recognised, as I describe in chapter six.

Within the village, rights over resources continue to be recognised and respected, but the rules are changing. For resources that are abundant, anyone from within the village can harvest these for their own use, provided they inform the 'owner'. As in the past, restrictions are often placed on resources that are scarce, and today, this is becoming increasingly necessary. For example, near Long Pasia there is a patch of heath forest to which one of the villagers holds land title. He has always allowed people to harvest rattans and edible orchids, which grow abundantly here. However, the collection of firewood was banned, because it was being rapidly exhausted.[11]

Increasingly, it is not just uncommon resources to which access is restricted, with a trend towards privatisation of all resources. For example, there is a large patch of bamboo forest near to Long Pasia, which today falls under the ownership of several people. One individual has let it be known that he does not want people collecting bamboo shoots from within his land, despite the fact that there has been a long tradition of open access to these. Although this is the cause of considerable ill feeling, such behaviour being seen as mean and not customary for the Lundayeh, it has not been openly objected to. Rather, it has led to other people following suit.

This shift towards increasing privatisation of resources can be seen as part of a wider trend towards the development of more explicit management systems. Thus, people have begun to cultivate more forest resources as these become scarce, and there is a growing interest in establishing fruit orchards. These recent changes illustrate the fact that the ways in which people manage their resources are not static, but rather are flexible and responsive to changing circumstances (Padoch, 1982: 3-9).

[11] This situation has now changed, as this area of land has been made into a community orchid garden, for the conservation of orchids and as a tourist attraction, part of WWF's activities with the village. Consequently, collection of all resources has been banned, to the annoyance of many.

4: 6. Conclusion

It is apparent from the preceding account that the landscape of the Ulu Padas cannot be regarded as wild. The resources within it have been influenced by people, and the landscape as a whole has been shaped by their actions. Therefore, the Ulu Padas is best described as a managed landscape.

It may not seem particularly important to question the use of the terms 'wild' and 'wilderness'. However, this is mistaken, for two reasons. Firstly, over-emphasis on a distinction between 'wild' and 'cultivated' can hinder our understanding of both subsistence systems and the historical ecology of landscapes. For example, focusing on cultivation practices has deflected attention away from the variety of other ways in which people interact with their environment and resources (Alcorn, 1981). Furthermore, not enough attention has been given to the less visible ways in which resources are managed (Padoch & Peters, 1993). That such a focus has limited our understanding of landscapes and their ecology is apparent from the growing recognition of the anthropogenic nature of many landscapes that were previously assumed to be 'wild' (Fairhead & Leach, 1998).

The second reason why analysis of the concept of 'wild' is significant is that describing resources or environments as 'wild' can have profound implications in relation to ownership and control over land and resources (Fairhead & Leach, 1998; Posey, 1998). I suggested earlier in this chapter that the role of people in managing their resources and environment is reflected in the Lundayeh system of rights of access and ownership. The same link, between ownership of a resource and investment of labour, is made in the state system of land rights. However, the state has chosen to define the Ulu Padas and its resources as 'wild', so denying the role of the Lundayeh in shaping this landscape, and consequently, denying their rights of access or ownership.

CHAPTER 5: A LUNDAYEH LANDSCAPE – PERCEPTIONS AND REPRESENTATIONS

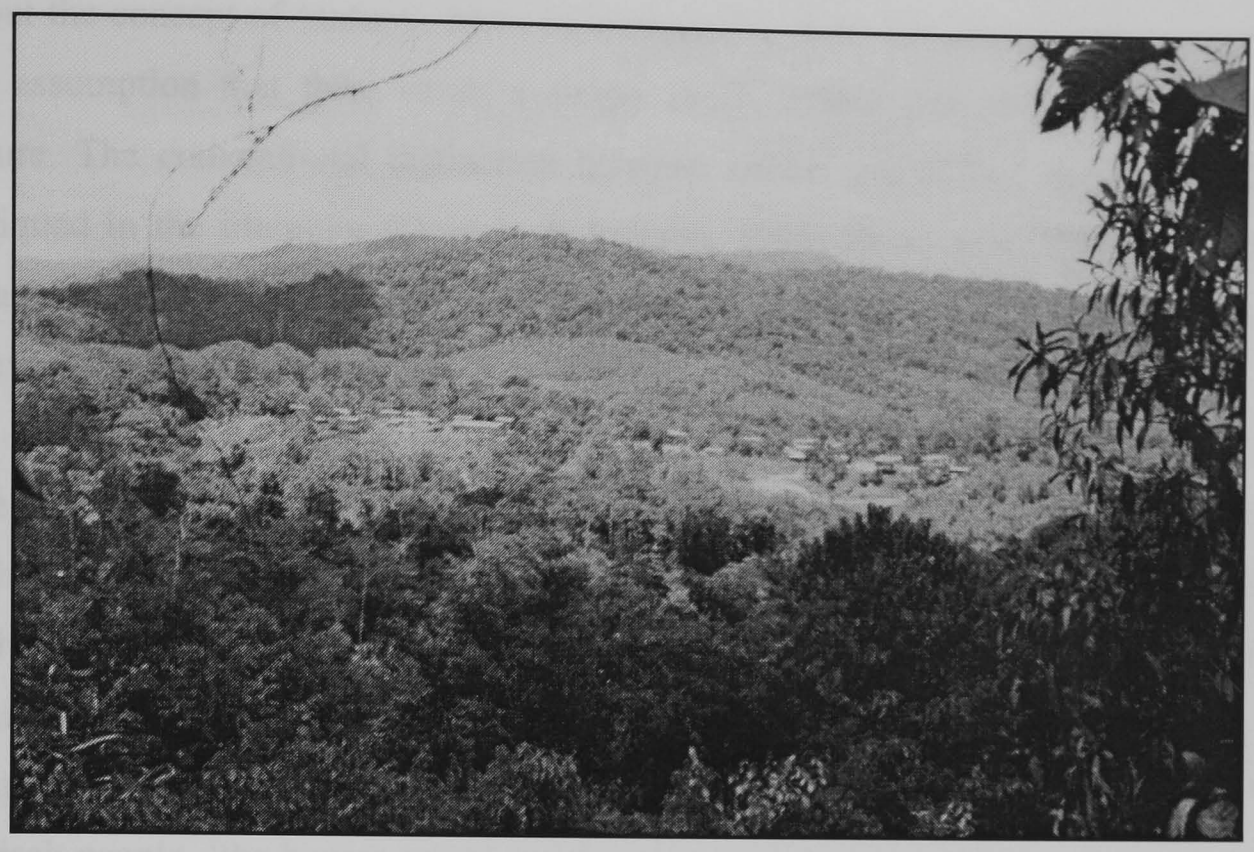
5: 1. Introduction

This chapter describes how local people perceive the Ulu Padas landscape, and suggests what factors have had a role in shaping their perceptions. I describe the meanings imbued in the landscape because of people's history in it and their beliefs, considering how these both shape and reflect people's perceptions. In addition, I consider the perceptions of outsiders to the area. A number of outside parties have been involved in the Ulu Padas, namely, the Sabah Government, timber companies, conservation organisations, researchers and tourists. I consider how these interest groups perceive the Ulu Padas landscape, and the impact that these alternative views are having on Lundayeh perceptions. However, before considering how local perceptions are changing, I begin with an overview of recent changes among academics in their perceptions of landscape.

5: 1: 1. Perceptions of landscape among academics

The photograph in plate 5.1 shows the village of Long Mio. On first viewing, the impression given is of a small settlement, surrounded by an expanse of seemingly pristine forest. Indeed, such was my over-riding impression when I first saw photographs of the Ulu Padas – I was struck by the vast swathes of forest, and the fact that people seem to have made little impact on the landscape. Today, looking at the same photographs, I see a different landscape. Rather than seeing small settlements in an otherwise untouched forest, I now recognise that much of the vegetation near the villages is agricultural land, and that the surrounding hills are covered by secondary forest. Furthermore, I see a landscape that is invested with memories and history. These are memories of my own exploits, and also stories I was told of the history of this place.

Plate 5.1: A view of Long Mio



The change in my perception comes partly from gaining a better understanding of the ecology of the area. For example, I can now more easily recognise secondary forest from old-growth forest. However, it is more than this. It also comes from the fact that I have lived in this place, and so it now holds its own memories and meanings for me. In other words, I have become 'implicated' in the landscape (Gow, 1995: 51). This transformation in perception always occurs when we move to a new place, as slowly it takes on meanings for us. The reason for describing this process here is because it illustrates the point that people's perceptions are shaped by their interaction with and knowledge of a landscape. Ingold (2000: 153) proposed that, to understand how people perceive their environment, we need to take a 'dwelling perspective'. Such a perspective not only recognises that people and their environment are intertwined, but also that these relations are reciprocal – that people and their landscape are created and formed together; in other words, that the landscape should be viewed as a process involving an 'unfolding' of relations between people and their environment (Ingold, 1993: 156).

Such a view now prevails within studies of landscape. It is recognised that the landscape cannot be viewed simply as a cultural construction, nor as a mere backdrop to human activity. Rather it should be seen as a 'cultural process' (Hirsch,

1995: 5). This change in ideas about landscape has been part of a wider shift in ideas about the concept of 'nature'. Most fundamentally, there has been a shift away from the assumption that there exists a single, cross-cultural and objective concept of nature. The conventional distinction between nature and culture has been widely critiqued in the literature (Descola & Pálsson, 1996; Ellen, 1996; MacCormack & Strathern, 1980) and so I will only highlight the main arguments here, as they are relevant to the Lundayeh data.

The challenge to the nature-culture dichotomy came on two fronts, from within anthropology, and also from developments in the field of biological evolution. From within anthropology, ethnographic research showed that for many societies, such a distinction is meaningless. For example, in many societies, ideas cross-cut any simple division of nature and culture. Thus, Karim (1981: 4) found that for the Ma' Betisek people, 'the human world and the plant and animal world are at certain times set apart and opposed and at other times conjoined', this depending on the kind of activities with which they are engaged. Similarly, Fairhead & Leach (1997: 9) found in their research that the people of Kissidougou do not associate forest with the natural state, but rather, with a settled state. Such findings make it clear that rather than there existing a clear dichotomy, understandings of nature are 'messy, cross-cutting and changing' (Ellen, 1996: 119).

The other source of ideas that challenged the nature-culture dichotomy came from developments in the study of evolution. Ideas about biological evolution had traditionally been founded on the concept that organisms adapt to a particular niche, the environment being seen as a constant and determining force. However, it has been argued that in the process of engaging with the environment, organisms may construct their own niches (Odling-Smee, 1994). Thus, relationships between organisms and their environments are reciprocal, each affecting the other.

These ideas have been applied by anthropologists to studies of the relationship between people and their environment. It was realised that arguments of causality may be over-simplistic, as typified by materialist hypotheses in which nature was seen as a determinant of social actions. Rather, the complexity of the interaction between people and their environment came to be recognised. The impact of this has

been seen in a wide range of studies. For example, Dove (1993) highlighted the possible co-evolutionary relationship between humans and the forest in his studies into the links between mast fruiting, wild boar populations, and Kantu' agricultural strategies. In a similar vein, Boster (1996) studied the relationship between classification, cultivation and selection of manioc cultivars by the Aguaruna, suggesting that human cognition has co-evolved with the natural world. The idea of people and their environment co-evolving now also prevails in studies of landscape (Hirsch, 1995), and here we can see the root of Ingold's idea of a dwelling perspective, to which I now return.

5: 1: 2. A dwelling perspective

Implicit in Ingold's dwelling perspective is that people's perceptions are shaped by their engagement with the environment. How people engage with their environment is, in large part, determined by their way of life. For example, hunters, farmers and fishermen interact with their environment in different ways, and so, each will have a unique understanding of it. Indeed, the significance of this has attracted much attention within anthropology. For example, much thought has been given to the hypothesis that hunter-gatherers, in contrast to agricultural peoples, have a unique worldview (e.g. Bird-David, 1990; Descola, 1992; Ingold, 1996). Other researchers have investigated how different societies living in the same place may have alternative views of their environment, for example, Morphy (1993) contrasted the different views of cattle farmers and Aborigines of Northern Australia. As well as varying between societies, there are often differences in way of life between various groups and individuals within a society. For example, men and women may undertake different subsistence activities. Similarly, in societies experiencing rapid social or environmental change, the young may follow a very different way of life to the older generation. Consequently, these different groups will perceive their environment differently.

The way people engage with their environment does not simply relate to subsistence activities, such as hunting, fishing or agriculture. Telling stories, singing, narrating myths and histories – these can also be seen as ways of engaging with the environment. 'In hunting and gathering, as in singing and story-telling, the world

'opens out' to people.' (Ingold, 1996: 145) Stories, songs and myths may describe beliefs about the origins of the natural world and its components, relate stories of events that occurred at particular places, or they may explain how people are regarded in relation to other organisms, perhaps in terms of metaphors or similes. In recounting such narratives, a particular view of the environment is portrayed. As Basso (1990: 141) writes, 'whenever the members of a community speak about their landscape... they unthinkingly represent it in ways that are compatible with shared understandings of how... they know themselves to occupy it'. Thus, such narratives are not only a way of engaging with the environment, but also reflect and convey people's environmental perceptions.

People's exposure to, and thus knowledge of, such narratives will vary according to the length of time that they have spent in a place, and so, the time they have had to learn about the environment and any associated stories and myths. It also depends on people's exposure to various systems of thought and knowledge, that of their own or other cultures. Typically, a culture's particular body of knowledge is transmitted to the younger generation as they participate in everyday activities with their elders, or listen in on story-telling sessions. However, in many societies, this is no longer taking place (Nabhan, 1998; Nahban & St. Antoine, 1993). This is because of changing ways of life, and also increasing exposure to alternative knowledge systems. For example, children may spend more time in formal education than with their own families and communities. They learn about biology as taught in schools, rather than local ecological knowledge, and consequently, their perceptions of the environment change.

In emphasising that people's perceptions are shaped by their engagement with the environment, it becomes apparent that they are not static. Rather, perceptions change, as people are exposed to new experiences and knowledge. Furthermore, it is clear that a homogeneous local perspective of the landscape may not exist. More typically, there will be differences in how an environment is perceived within a community, for example, between those that have been school educated and those with no formal education, between longstanding inhabitants and newcomers, or between the young and old. Furthermore, the local perspective will differ from that of outsiders, such as government officials or researchers. Rarely are these differences fully recognised,

either in academic research, or by those interested in such matters for reasons of conservation or development. The perspective of the most dominant group usually prevails, perhaps that of the village founders or elders, or it may be the outsider's view that prevails, for example, the government officials' view. In my own discussion, I will talk about the 'Lundayeh view'. This is not to imply that there is a homogeneous perspective, but it simply reflects the level at which certain generalisations can be made. I will, in addition, discuss some of the differences in perceptions that exist between villagers.

5: 1: 3. Sources of data – expressions of perception

How people perceive their environment can be deduced in a number of ways. Much can be learnt from what people say themselves about their environment. This includes not only what people say when directly questioned about their views, but also, what is said, or implied, in stories and myths. In this account, I consider the ways in which people's history in the region is reflected and recorded in the landscape with evidence from oral histories, place names, as well as artefacts such as archaeological remains. I also describe the beliefs and myths associated with the landscape.

Much of this information was revealed to me piecemeal, people commenting on the landscape as we passed through it, describing family histories, or past beliefs and practices. At other times, I spoke with the elderly generation and asked them to recount stories and myths about the region, as well as their own histories. Construction of maps of the village areas, including local toponyms, proved a particularly rich source of information, since many of these names refer to myths, historical events or ecological features. These maps were also valuable in highlighting differences in perceptions of the environment. In each of the villages I asked the men and women to draw a map of the area showing place names and the areas of resource use (as described in chapter one). These maps are shown in figures 5.3 – 5.6, although only a few of the river names given by the men are indicated on the maps, for the sake of clarity. All the names recorded are shown in figure 5.1.

I also participated in a series of workshops organised by WWF. One of the aims of these workshops was to assess the values of the environment for the various stakeholders in the Ulu Padas. These were held in Long Pasia in July 1999 over a period of four days. The term 'stakeholders', popular in the field of natural resource management, refers to the various individuals and groups who have an interest in the region. In the case of the Ulu Padas this includes the residents of Long Mio and Long Pasia, NGOs (WWF and PACOS (Partners of Community Organisations[12])), Government departments (of which two attended the workshops, the Department of Forestry and the Ministry of Tourism, Environment, Science and Technology) and also the logging concessionaire, Sabah Forest Industries (who did not attend). All the participants in the workshops were divided into groups. Local people were split into groups of adult men (two groups of 19 and 15 people), adult women (24 people) and the youth (17 boys and girls). In addition, there were groups to represent NGOs (11 people), and the two government departments in attendance (5 people). Each of these groups was then invited to identify what uses and values the Ulu Padas environment held for them, and to rank these depending on their importance. Half an hour was spent on this exercise, after which the groups presented their results to everyone else for further discussion. The findings are summarised in table 5.1.

5: 2. Reading history in the landscape

In chapter four, I described how people's agricultural and extraction activities influence the structure and composition of the forest. However, they do more than this. These activities influence the way in which the forest is perceived, since they give it a history. As Tsing (1993: 164) expresses it, 'one of the most important ways in which the forest gains a history is through the cutting and regrowth that accompanies shifting cultivation.' This is also true for the Lundayeh. People know where their ancestors previously farmed and lived, not just from oral histories but also from the evidence in the landscape. This is illustrated by the pattern of forest types depicted in figure 4.1, these reflecting the history of settlement and land use in the Ulu Padas. Thus, the landscape is an 'historical record of the activities of past generations.' (Rival, 1998: 237)

[12] PACOS is a Sabah organisation, working particularly with rural communities to build capacity, and provide assistance with land issues.

Table 5.1: Workshop findings – evaluations of the Ulu Padas

	MEN'S VALUES (GROUP 1)	MEN'S VALUES (GROUP 2)	WOMEN'S VALUES	YOUNG PEOPLE'S VALUES	GOVERNMENT DEPARTMENTS' VALUES	NGO'S VALUES
Most important	Tradition & origins Land & livelihood Hunting Rivers (water, fish) Food (vegetables) Medicinal plants Fruits (for people & for game animals) Wood Damar tree (*Agathis*) Traditional route to Sarawak	Wood for construction Clean water Food (fish, vegetables) Agricultural land Hunting Pastures for buffalo Clean air	Food (vegetables) Craft materials (bamboo, rattan) Medicines Fuelwood Leaves to wrap rice Land for fields Water	Water (communications, drinking, bathing) Food (game animals, vegetables)	State revenue Habitat for wildlife Ecotourism	Biodiversity Water catchment Existence value
2nd most important	Flowers (orchids etc.) Beehives Natural salt licks Bamboo forest Materials for handicrafts Historical & legendary places Gravesites	Tourism Forest resources (e.g. rattan, damar, weaving materials) Medicines Historical places	Damar (for wood & resin (in the past)) Source of rope	Wood (firewood & construction) Medicines Other resources (for handicrafts, rope, etc.)	Water catchment	Endemic species Cultural values Maintenance of climate
3rd most important	Birds Natural MSG Leaves for roofing Roots	Maintaining cool climate	Recreation	Recreation (waterfalls, lake, hills)	Research	Beautiful place Recreation & tourism Medicines
4th most important	Stones (for road maintenance)					Place for research

Individual trees may also provide links with the past. As I described in chapter four, fruit trees are often taken as evidence of people's past residence in an area, and so, these trees serve as reminders of previous inhabitants and of their actions. Furthermore, knowing that a particular tree was planted by an ancestor creates a tie with that place for their descendants. Rights to harvest the products of planted trees are inherited, passing to all the descendants of the person who planted the tree. Therefore, such trees serve as a link, not just with the ancestor who planted the tree, but also between all his or her descendants. As Padoch & Peluso (1996: 128) observe for the Bagak and Tae people of Kalimantan, 'for the descendants of the tree planter, the tree represents their common ancestor and is a symbol of their kinship'.

Hunting, fishing and harvesting of plant resources also add to a place's history. Through these activities, the forest becomes the location of tales about hunting experiences, and encounters with animals or sometimes ghosts. For example, when walking in the forest, it is common for stories about past events that occurred there to be related. These may tell of an encounter with a large boar and how it was hunted down, or a place on the river where the fish *lawid luang* (*Tor* sp.) once spawned, as they did one year, to local people's amazement.

These activities are physically reflected in the landscape, for example, in the existence of trails, resting places, and camping sites. Trails criss-cross the landscape providing routes to people's fields, and there is an extensive network of trails used for hunting. Trails also link Long Pasia and Long Mio with Lundayeh communities in Sarawak and Kalimantan. These are long-established routes, used when people migrated to the area. Until thirty years ago, the trail to Long Semado in Sarawak was much frequented, as this village was the closest source of processed goods. These trails continue to be used today by people going to visit relatives, or participating in events such as Indonesia's annual independence celebrations, church gatherings or football tournaments. Descola (1994) noted that for the Achuar of Amazonia, the pattern of forest trails between people's houses, beaten by people's feet as they go visiting, reflected the pattern of social relationships. In the same way, the network of trails that link Lundayeh communities reflects their unity as a people, something that persists in spite of state and national boundaries.

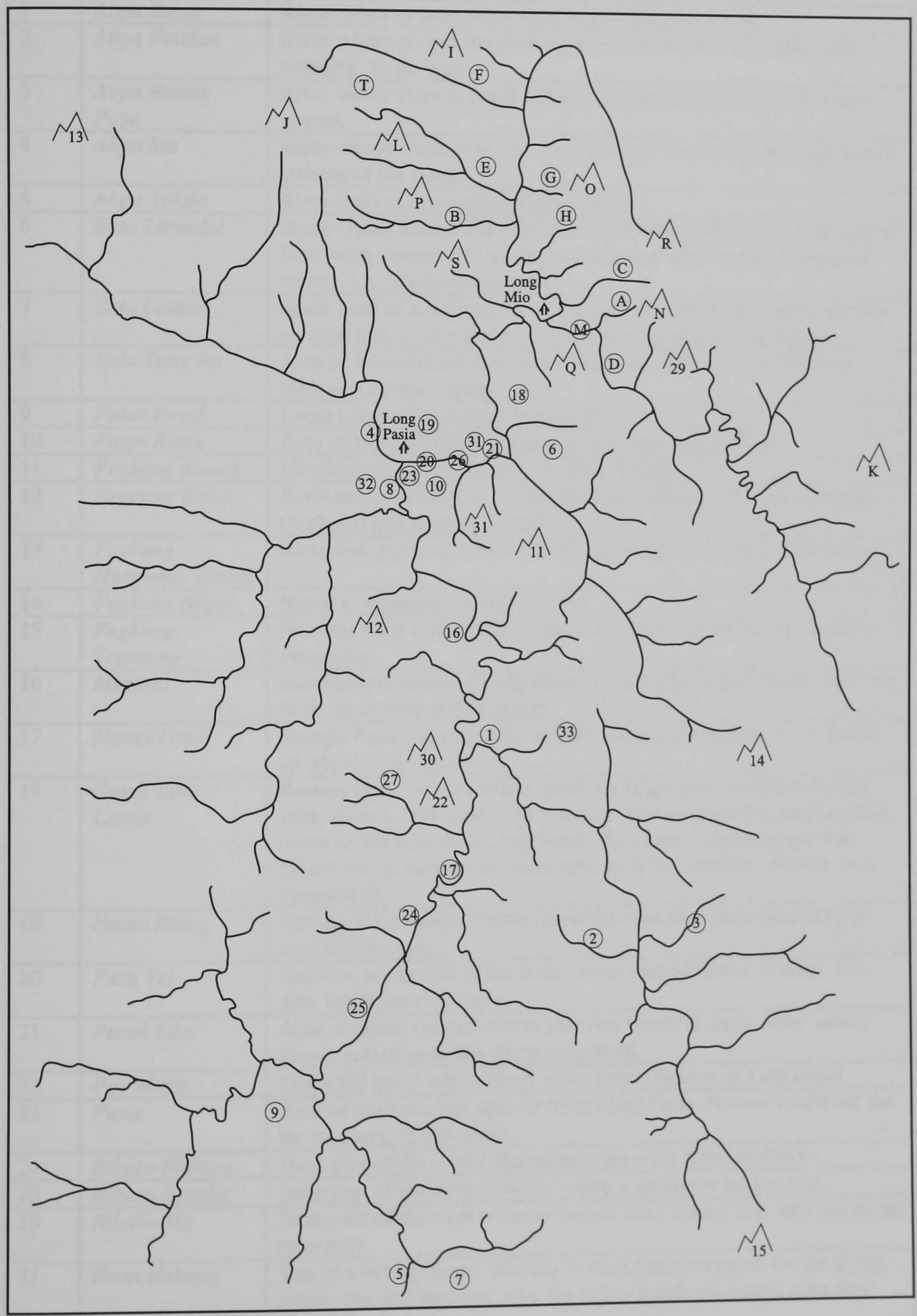
These trails also serve as a reminder of a past way of life. For example, when people follow part of the old trail from the villages to the lowlands, they are reminded of the time when people had to travel by foot, before road transport became the norm. Furthermore, should people travel along this trail as far as the resting place known as *Natad Lemut*, they are reminded of other aspects of the previous way of life. At this site lies a large rock that is regarded with some fear by local people. In the past, it was a well-established resting place for those walking down to the lowlands. However, some twenty years ago a curse was placed on it, apparently by someone from a neighbouring Murut village, such that anyone who sat on the rock became ill. One man from Long Pasia was said to have fallen ill as a result of this curse. Consequently, when people encounter this rock today, they are reminded of this man, and also of the time when use of such curses was commonplace.

Thus, following these old trails can be an act of remembering. This is also true of taking part in 'traditional' practices. Following a way of life that was also that of your ancestors may evoke memories of these people and of the past. In this way, a way of life is 'not just an *object* of memory..., but also a *practice of remembering*, embedded in the perception of the environment.' (Ingold, 2000: 148) This was brought home to me on a trip to Long Semado in which I participated. During our journey, various tales were recounted of previous trips made along the same route. One man told me that he had walked from Long Semado as a boy, carrying a piglet in his arms, when his family moved to Long Pasia in the 1960s. Several people reminisced about the time when a large party (including two buffalo for the wedding feast) had walked to Long Semado for the marriage of a girl from Long Pasia.

People's history in the area is also recorded in place names. Names can be highly evocative, recalling previous inhabitants, past events or social activities (Atran, 2001; Basso, 1990; Johnson, 2000). Figure 5.1 shows all the place names recorded during the mapping exercises, and the meanings of these names are explained. Some places are named after certain people, for example, *Meganit* is named after Ganit, a girl who drowned in the river here. *Takeh Felali* is the name of a lake (*takeh*) beside which a woman called Felali used to live. A few places are named after particular resources,

such as Long Bayur, *bayur* being the name of a tree that is prevalent there. The origin of some names has been lost. A few are known to be Murut, evidence for this

Figure 5.1: Local place names



Legend for Figure 5.1: Local place names

(Key refers to the locations on the following map.)

KEY	LONG PASIA PLACE NAMES	
1	*Abpa Bayur*	River (*abpa*) where many *kayu bayur* trees are found.
2	*Abpa Pelidan*	River where people frequently get lost. *Pelidan* is a Murut word meaning 'to get lost'.
3	*Abpa Rupen Payo*	River where there is a salt-lick (*rupen*) frequented by sambar deer (*payo*).
4	*Abpa Sia*	River whose waters run red (*red*). (This is because of the high tannin content of the water.)
5	*Abpa Tukilo*	River that runs through a plateau (*tukilo*)
6	*Batu Lemudoi*	Stone (*batu*) named after the man out of whom this stone was said to have been formed. He was turned to stone after he had committed *masab*, i.e. mocked an animal.
7	*Batu Linanit*	Stone used as a resting place. It was covered in moss, and so people scraped this off (*linanit*) to make it a better place to sit down.
8	*Bulu Tung Ra*	Area of forest which is dominated by the bamboo *bulu (be)tung* (*Dendrocalamus asper*).
9	*Fatar Rayeh*	Large (*rayeh*) area of flat land (*fatar*).
10	*Fatar Rieng*	Area of flat land (*fatar*) named after a man called *Rieng*.
11	*Fegkung Anang*	Mountain (*fegkung*). *Anang* is a Murut word.
12	*Fegkung Butoi*	*Butoi* means smallpox, but no-one could tell me why this mountain (*fegkung*) had been so named.
13	*Fegkung Harimau / Rimau*	Mountain (*fegkung*) where there used to be lots of tigers (*harimau*).
14	*Fegkung Napui*	*Napui* is apparently a Murut word.
15	*Fegkung Tepalang*	Mountain that runs at right angles (*tepalang*) to all the surrounding mountains.
16	*Meganit*	Satellite settlement of Long Pasia, named after a girl, Ganit, who fell in the river here and drowned.
17	*Naraa Uned*	Shingly bank (*naraa*) in the middle (*uned*) of the river, i.e. it forms an island in the river.
18	*Natad Batu Lemut*	Resting place (*natad*) where there is a large moss-covered (*lemut*) stone (*batu*). This used to be a regular resting place for people going down to Sipitang from Long Pasia. However, a curse (*urep*) was placed on the rock many years ago, such that anyone who sits on it becomes ill.
19	*Natad Iliang*	Resting place (*natad*) in the forest that had first been cleared by a man called *Liang*.
20	*Paru Tei*	Shallow, stony area of the river (*paru*) named after a woman, Tei, who fell in the river here.
21	*Paruk Siku'*	Area of rapids (*paruk*) where the river bends sharply. *Siku'* means elbow, referring to this sharp river bend.
22	*Pog Merit*	Small hill (*pog*) where many *merit* trees (*Shorea* sp.) are found.
23	*Pusis*	Area of shallows just upriver from Long Pasia. No-one could tell me the meaning of this name.
24	*Ribaru Midang*	Deep part of the river (*ribaru*) near the river Abpa Midang.
25	*Ribaru Semilig*	Deep part of the river (*ribaru*) where a *semilig* is said to live.
26	*Ribaru Sia*	Deep part of the river (*ribaru*) named after a man, Sia, who fell in the river here.
27	*Ruan Kubeng*	Top of a valley (*ruan*). *Kubeng* is the Lundayeh name for the flying lemur, but no-one knew why the valley had been named after this animal.
28	*Surud Bang Surung*	*Surung* is a place to herd buffalo. This hill is so called because it lies within a valley used to herd buffalo in the past.

KEY	LONG PASIA PLACE NAMES - continued	
29	*Surud Riman*	Hill (*surud*) with a single *riman* palm (*Caryota no*) growing on its peak.
30	*Surud Tador Abpa Bayur*	Hill that overlooks the river Abpa Bayur, so it is likened to a verandah (*tador*).
31	*Takeh Felali*	Lake (*takeh*) that a woman called Felali used to live next to.
32	*Takeh Ulu*	Lake (*takeh*) where someone once saw a head (*ulu*) rise out of the water.
33	*Takung Kelio*	Lake (*takung*) named after the tembadau or wild cattle (*kelio*), although for unknown reasons.

KEY	LONG MIO PLACE NAMES	
A	*Abpa Lelubeng*	River that is very deep (*melubeng*).
B	*Abpa Lelutut*	River with silty or muddy (*lelutut*) water.
C	*Abpa Lotok*	River that becomes very silted after rain. *Lotok* is apparently a Murut word meaning muddy.
D	*Abpa Mio*	River named after someone called Mio who was swept down this river.
E	*Abpa Pegisi*	River with a very flat river bed. Pegisi is Murut for flat or even.
F	*Abpa Selau*	River where someone once crossed and lost their bracelet (*selau*) in the river.
G	*Arur Batu Lawey*	Stream (*arur*) in which there is a rock (*batu*) that used to move up and down river. Apparently, it no longer does so, perhaps because the spirit which caused it to move has fled.
H	*Arur Leluba*	Stream where many *kinangan* palms (*Eugeissona utilis*) are found. *Luba* is apparently the Murut name for this palm.
I	*Buduk Bong*	Peak of a hill (*buduk*), so called because during a flood that occurred a long time ago, all that remained above the water level were the leaves of a banana plant (*bong*) growing here.
J	*Fegkung Senipong*	Mountain (*pegkung*) that is shaped like the *apong* (lower abdomen).
K	*Muruk Mio*	Place where the River Mio goes underground. *Muruk* is the general name for such a place, i.e. where a river 'disappears'.
L	*Pog Aru*	Small hill (*pog*) where many *kayu aru* trees are found.
M	*Ribaru Burek*	Deep area of river (*ribaru*) where the water bubbles (*meburek*).
N	*Surud Balad Riaku*	Flat (*balad*) hill (*surud*) where many *bua riaku* (*Garcinia forbesii*) trees are found.
O	*Surud Itud*	*Natud itud* means to strike a fire, however, no-one was sure why this hill was so named.
P	*Surud Kedingau*	Hill (*surud*) where many cinnamon trees (*kedingau*) grow.
Q	*Surud Nan Mipil Apo*	Hill (*surud*) where people used to collect roofing material (*apo*). *Mipil* means to make thin strips of wood or leaves.
R	*Surud Nan Puput*	Hill (*surud*) where many flies (*puput* – a fly that lays its eggs in the carcasses of animals) are to be found.
S	*Surud Neteg Tawak*	Hill (*surud*) where a *tawak* (gong) used to hang beside the path that people followed when they walked down to Sipitang. People would strike the gong when they passed by to announce their imminent arrival at the village.
T	*Takung Tengiow*	Lake (*takung*) where a mythical creature (*tengiow*) was once encountered by a group of people who were poisoning fish here. No fish are found in this lake.

people's prior residence in the area. Certain historical events have been recorded in place names. *Ribaru Sia* is an area of rapids (*ribaru*) on the River Matang where a man called Sia once upturned his boat when on a fishing trip. Other names relate to past practises, such as *Surud Neteg Tawak* – a hill on the route from Sipitang where people used to announce their imminent arrival by striking (*neteg*) a gong (*tawak*) left by the side of the path. Similarly, *Surud Nan Mipil Apo* is the name given to a hill (*surud*) near Long Mio, where people used to go to collect roofing material (*apo*), this being particularly common here.

These latter two examples illustrate that, just as trails can evoke the past and a previous way of life, so too can place names. Neither of these hills have been the site of the activities after which they are named for many decades, but the names persist. Thus, it becomes apparent how living in a place, or in Ingold's terminology (1996: 150), how 'the engagement of human beings' with their environment, not only has an ecological impact: it also adds to a place's history. Naming features of the landscape is an important part of this process, and in this way, it becomes 'a reservoir for detailed ecological knowledge and a repository for the memory of past events.' (Brosius, 1986: 175)

The landscape's history is also manifested in more 'concrete' ways, in archaeological remains. On a few occasions, I was walking in what I took to be 'primary' forest only to come across an *ulung buaya* or *ulung darong* (plate 5.2 & 5.3). These are the earthen mounds, described in chapter two, that were built next to longhouses for ceremonial purposes in headhunting days. These mounds are scattered throughout the Ulu Padas area. Burial grounds also provide evidence for previous habitation of the area. Numerous sites exist throughout the area, at which burial jars and skeletal remains are still found (plate 5.4). The locations of these earthen mounds and burial sites are shown in figure 2.2.

Perhaps the oldest site, and one that is of particular significance for the Lundayeh, is *Batu Narit*. This is a large rock (*batu*) whose surface is covered with engravings (*narit*) drawn in circles and swirls (see plate 5.5). The creator of this is said to be Upai Semaring, a Lundayeh culture hero who lived in the distant past. He was possessed with supernatural strength, and so he is said to have made these engravings

Plate 5.2: *Ulung buaya* – an earthen crocodile mound

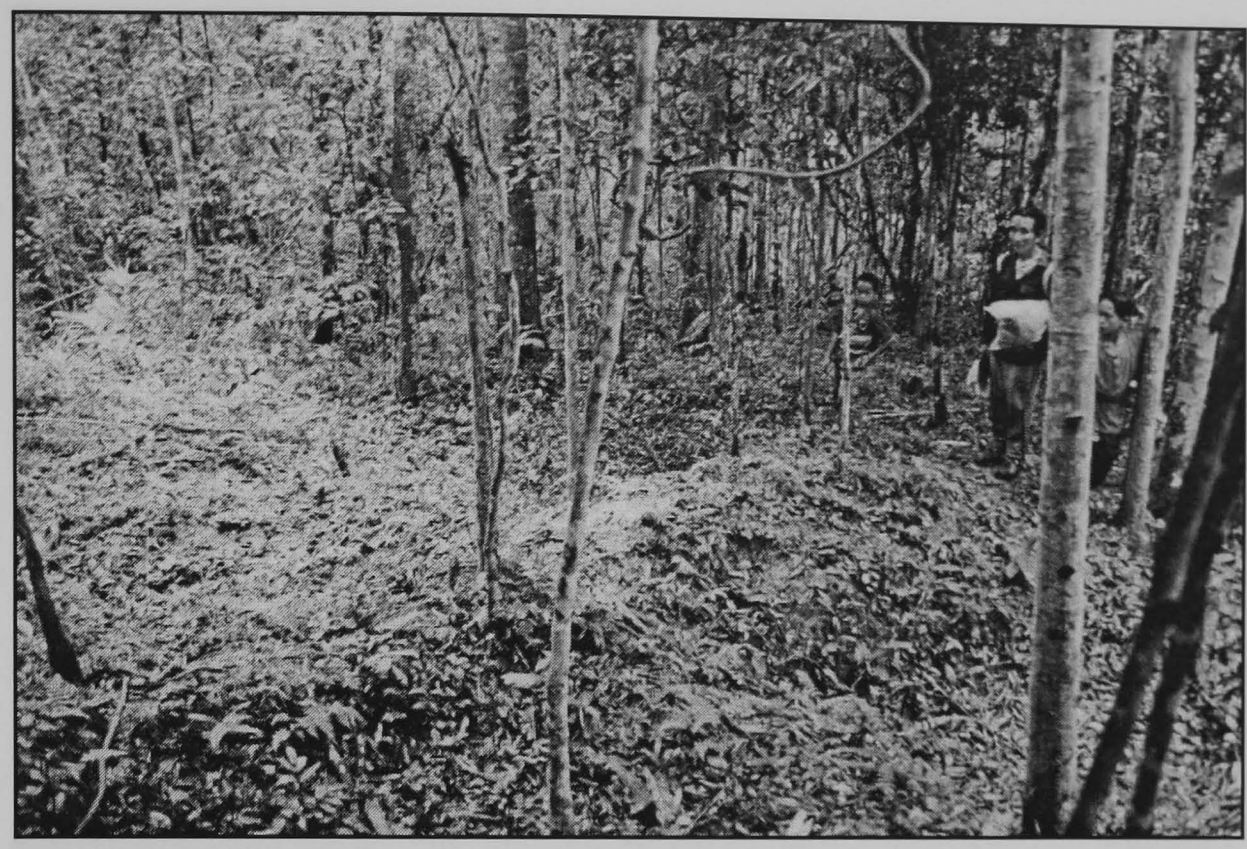


Plate 5.3: *Ulung darong* – an earthen serpent mound

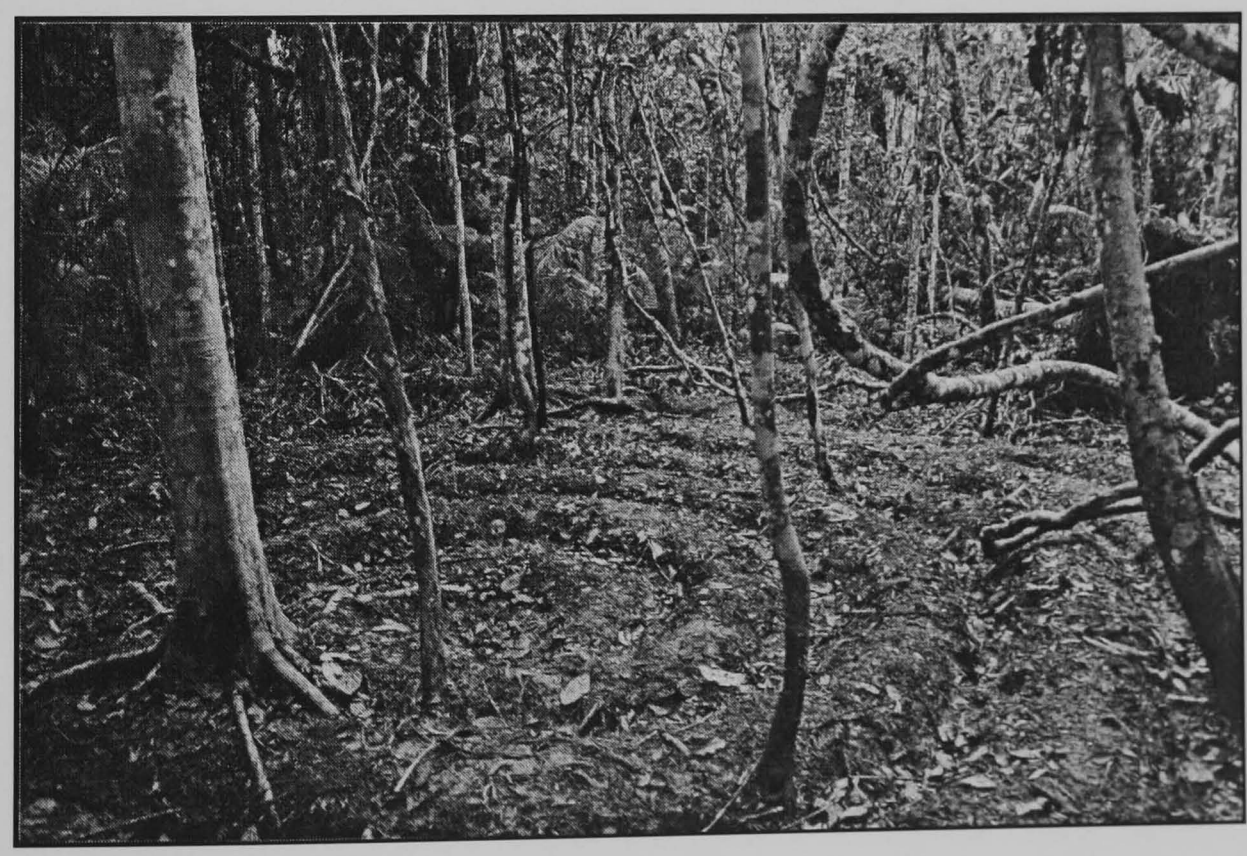
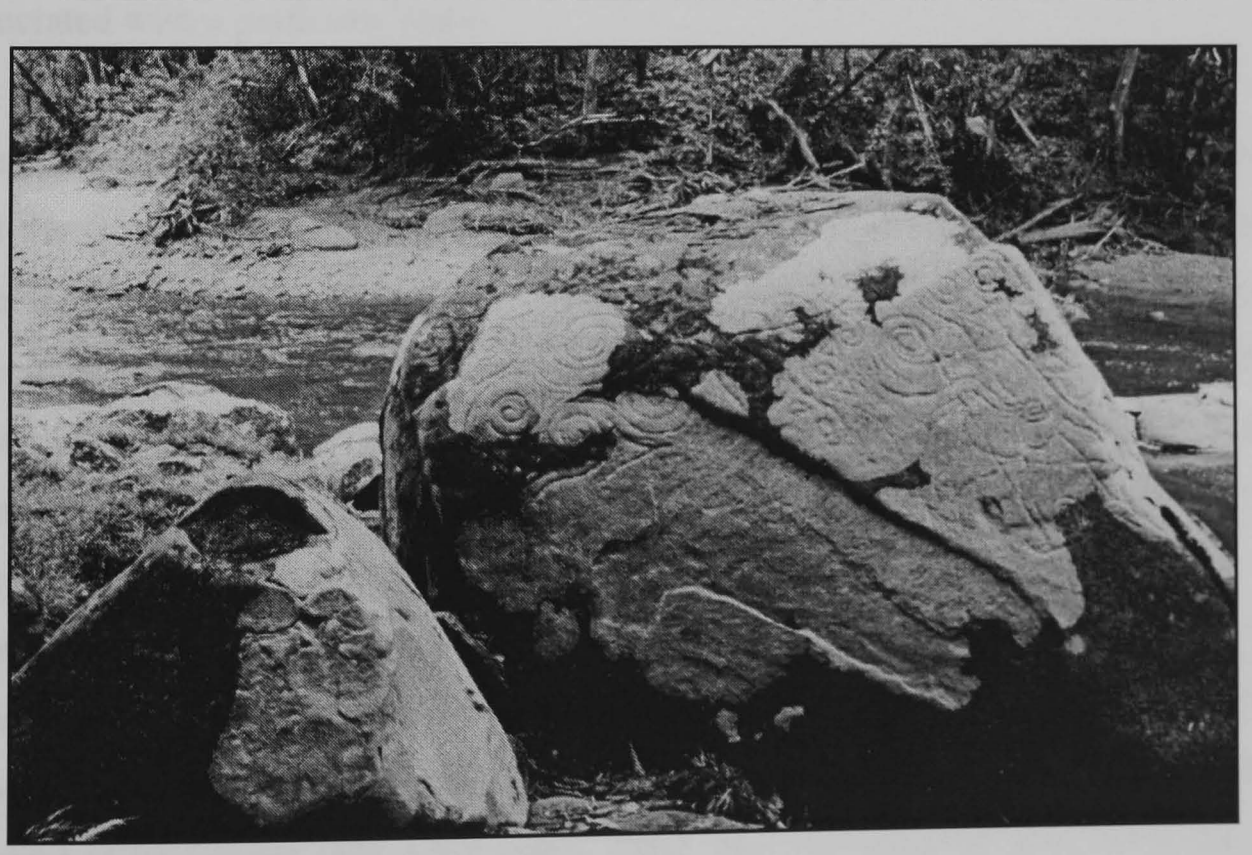


Plate 5.4: Broken jars at an old burial site

Plate 5.5: *Batu narit*, a rock engraved by the legendary Upai Semaring



with his finger. There are various sites with which Upai Semaring is associated. Another similar stone exists across the State border in Sarawak on the trail to the village of Long Semado, and in Kalimantan there is a large rock said to be the door of his house. Very near to Long Pasia is a site where Upai Semaring cooked over a fire, this being marked by three large rocks. Further upriver on the River Sia his footprints can be made out in the rocks. These sites are important for the Lundayeh people as a whole, and link them to the region that they regard as their homeland.

In all these ways we can see how the landscape is 'woven like a tapestry from the lives of its inhabitants' (Ingold, 2000: 150). This is an ongoing process, since as people live in a place, they not only get to know its history, but they also make history as they participate in events that will be recounted in future years. Today, walking through the forest, or travelling upriver, people describe the land's history. They may point out the place where they were born, or where their relatives used to live, and the areas of forest that their ancestors cleared, and trees that they planted. They may also recount stories of hunting exploits, or journeys made, or tell myths associated with a particular place.

These stories, and the knowledge they entail, forge ties between today's inhabitants and the land, reminding people of their ancestors, and of their history in the area. Recounting the land's history also has a more prosaic role, and that is in struggles over land rights. Fairhead & Leach (1997: 12) described how for the people of Kissidougou, knowledge of trees and forest is used in social and political struggles. Similarly, the Lundayeh use such knowledge for land claims, since rights to land were traditionally established on the basis of the history of land use. Today, this system is in decline, as I described in chapter four, but it is still important. The continued relevance of history for land claims is apparent from the fact that when people recount stories of the history of the land they often conclude these with an account of its current ownership status. Thus, they will describe who owns the land and how they came by it, or who has a land claim in process, as well as an assessment of the legitimacy of these claims, usually on the basis of the story just told. Furthermore, claiming land as traditional territory is used in justifying applications to the Government for land title. Discussion of land claims is the topic of much discussion within the communities, and the existence of alternative histories

means that these are sometimes disputed. Even for land to which title has already been granted, claims continue to be justified or contested on the basis of the land's history. The history of the area and the view of the Ulu Padas as part of their ancestral land has also been used by the communities as a whole to argue for their prior rights to land and resources against outsiders. On this basis, they have contested decisions made about the exploitation of the region for logging. For example, appeals made by the communities to the government and logging concessionaire, some of which have appeared in the press, refer to their long historic links with the area (figure 5.2). I discuss this issue further in chapter six, in the context of attitudes towards conservation.

5: 3: 1. Spirits and serpents

Downstream of Long Pasia are two rocks lying alongside each other. These are said to be a man and woman who were turned to stone after they had laughed at an animal. Mocking any animal, but particularly dogs, cats, frogs, or bears, is said to cause violent storms[13]. It may result in people's heads becoming twisted on their necks, or in cases of serious infringement of this rule, people may be turned to stone when the subsequent rain falls on them (a curse known as *masab*). Stories are told of this happening in the fairly recent past, and although many people say that they do not truly believe them, they take care not to laugh at animals. Such beliefs, as well as influencing people's behaviour, shape the way that the landscape is perceived. Thus, in the same way that the landscape is enriched by its history, it is also enriched by the stories and myths associated with it.

Many Lundayeh stories and myths relate to spirits or ghosts (*ada'*). There is a strong belief in spirits, and some people are very afraid of them. For example, one young man, a renowned hunter with a reputation for being aggressive, would not venture into the forest alone. Indeed, few people like to be on their own, partly because of their fear of spirits. If I was ever alone, whether out in the forest or fields, or walking at night in the village, people always asked me whether I was afraid of encountering spirits.

[13] This is a widespread belief in Southeast Asia, as I refer to later in this chapter.

Figure 5.2: Newspaper articles reporting the Lundayeh's campaign against logging in the Ulu Padas

Long Pasia villagers seek Native Reserve

SIPITANG, Tues. — Long Pasia villagers have submitted an application to the Land and Survey Department for a 4,500-hectare Native Reserve to ensure that some land is retained for long-term communal access, as logging activities continue to threaten the livelihood of the people.

Village headman, Mudin Sia, said the community depends heavily on the forest as a food and water source. More importantly, Mudin said the Native Reserve would encompass the Matang River and ancient burial sites.

A historic route to Kalimantan in Indonesia is also located within the 4,500 ha, according to Mudin.

He said in efforts to save the heritage of rich forests surrounding Long Pasia, villagers were keen to venture into eco-tourism, adding that nature tourists came to the village quite often.

"We see eco-tourism as a way of conserving our forests. However, logging has come too close to our village. Our rivers are getting polluted, making it difficult for us to get fish, compared to a few years ago," Mudin said.

Long Pasia is located within the 80,000 ha biodiversity rich Ulu Padas area on the southwestern part of Sabah. Villagers have repeatedly appealed to the authorities to review logging activities near the village, but their appeals seem to be falling on deaf ears.

The latest initiative by the community was to send a letter to Sindumin Assemblyman Datuk Sapawi Ahmad, seeking his assistance to put a hold on logging in Ulu Padas as the area is hilly.

The letter dated April 23 also said the area is home to medicinal plants, fish, and rich in heritage including ancient graves and former settlements of the Lun Dayeh people, who now live in Long Pasia.

area in Ulu Padas close to Long Pasia.

(New Straits Times, 5th July, 2000)

Another plea for Long Pasia heritage site

By JAMES SARDA

KOTA KINABALU: The Barisan Nasional Information Chief for Lumadan and Sindumin, Philipus Pur, supported Wednesday the growing call to declare Long Pasia a cultural heritage area.

He claimed logging operations by SFI are biting into Sabah's only authentic Lundayeh settlement and defeating hopes of turning the area into in a tourism revenue puller.

There are some 5,000 Lundayeh in the 100,000 hectare area, mainly concentrated in Long Pasia, Long Miu and Meganu. There are also pockets of Lundayeh in Lawas across the Sarawak border and in Lun Bawan in Indonesian Kalimantan.

"One of the (SFI) contractors have already reached Pa Rurun and another has established a major camp at Muruk Miau, an area which is some 2,000m above sea level.

Philipus

He also backed claims that some of the logging contractor's have damaged ancestral grave sites.

A police report was lodged recently by the descendants of one of those buried there who claimed that broken pieces of old burial jars where the bones of the dead were kept were strewn all over.

Please See Page 2, Col. 3

The three Astro satellite dishes at Long Pasia

(Daily Express, 20th May, 1999)

Many people have encountered spirits while out in the forest, and less commonly within the village. The spirits most often met with are simply mischievous rather than dangerous. They may lead people astray in the forest, throw sticks or frighten people with noises. They can also be more harmful, for example, spirits are said to protect the nests of honey bees. If these spirits are not scared off beforehand by shouting and calling they will cause the honey collector to fall from the tree. Similarly, if someone is hit by something thrown by a spirit, that person will fall ill, and may die. Another resource that spirits are said to protect is a vine, known locally as *sapan*, used as a hunting charm. Apparently spirits plant this vine, or, as the Lundayeh put it, they make a garden (*ngenau kebun*). If the spirits know that someone has harvested the leaves of this vine, they become angry and will try to kill those responsible. Therefore, when someone is collecting the leaves, they should use a stick to knock them off, rather than cutting the leaves with a knife. This apparently tricks the spirits into thinking that the leaves fell off accidentally. A story is told in Long Pasia of two local men who went to collect this vine and used their knives to harvest the leaves. They slept overnight in the forest on their way back home and dreamt that they were being chased by spirits. On waking up, they fled back to the village in terror (but without coming to any harm).

Some spirits are said to be the ghosts of people who have died. For example, near Long Pinasat, the ghost of a girl who died in childbirth is said to roam. However, most spirits are not associated with particular people, but are thought to have always existed. Some are associated with particular places. For example, many lakes, waterfalls, and mountains are said to have spirits living there and guarding these sites. In the past there was said to have been a spirit at Ruab Rikong, a waterfall upriver from Long Pasia. This is now thought to have gone, perhaps because of disturbance in the area from logging. The absence of the spirit was one reason suggested for a landslide that occurred next to the waterfall a few years ago.

Although stories about spirits abound in the oral heritage of the Lundayeh, spirits are encountered less frequently nowadays, and they are said to be less powerful. People say that this is because they are now Christians, and the spirits are afraid of the Christian God. One elderly lady told me that when she was a girl she often heard spirits during the night, but she has not heard them in many years. However, belief in

spirits has far from disappeared, as is apparent from the following example. I was told that people used to believe that if there was a red sky, then spirits were roaming. At such times, people would stay indoors for fear of encountering a spirit, something that could make you ill. Although this had been described to me as a belief from the past, it is still held by some people. This became apparent to me on one occasion when there was a dramatic sunset with a vivid red sky. I was holding a young baby near to the window, and when the baby's grandmother noticed this, she told me to come away for fear that the child might become ill.

As well as spirits, a number of mythical creatures are said to inhabit the Ulu Padas, such as the *galau* and the *semilig*. The latter is said to have the appearance of a sambar deer, but its fur points the wrong way. Some people told me that it is white, and that it can change form. If this creature is encountered it is said to portend death. The same is true of the *galau*. This creature lives in deep parts of the river, and there are certain stretches of the River Matang renowned for encounters with the *galau*. It was described to me as being like a dragon, or a very large snake – a serpent-like creature perhaps. People are particularly likely to encounter the *galau* if they have committed *meketefan*. To *meketefan* is to talk about food before going out on a journey, especially before going to the river. Examples of this would be if someone is invited to eat before leaving on a trip, but they decline, saying that they will eat later. Or, when setting off on a journey, they say 'I have forgotten to bring any chillies'. Following such an occurrence, they are very likely to meet a *galau*, or to meet with some kind of misfortune. (I did commit *meketefan* on one occasion, on a trip upriver to see the fish spawn. On the way we grounded our boat on the shallows, damaging it beyond repair.)

Although most people still believe in these creatures, a few express scepticism. Some people, accepting their existence, think that their power has diminished. For example, one man told me that if he were to see a *galau* he would not die because he believes in God. However, when I spoke of the *galau* one time when bathing, I was quickly hushed. These creatures are less commonly encountered nowadays, although during my time there, the mysterious disappearance of a dog in the Matang River was put down to a *galau*. The decline of *galau* is said to be due to the fact that there is more disturbance in the forest and rivers. For example, a few years back, some people

apparently used bombs for fishing in a stretch of the river where a *galau* had often been encountered in the past. After this it was never seen again, and people suggest that it was either killed or frightened away.

Meketefan is one of only a few examples of taboo behaviour to be found among the Lundayeh. Two others I have also mentioned, the rule against mocking animals, and that regarding the correct procedure for harvesting the vine *sapan*. The only other taboos that I encountered relate to hunting. Thus, I was told that when going into the forest on a hunting trip, you should only take vegetables with you to eat with your rice. If you take meat, then you will not catch anything. I was also told that if you meet a hunter who has caught something while out in the forest and he offers you a share, you must refuse, otherwise you will not be successful in your own hunt. However, not everyone believes this. A few people told me that these are just superstitions, and that when they go hunting, they take whatever food they want into the forest and are still successful at hunting.

That hunting in particular should be the subject of such beliefs is perhaps not surprising, both because of its importance for subsistence, and because of the element of chance involved. Some people have their own particular superstitions, for example, that you must not step over a gun or spear, or you will not catch anything. Many people use hunting charms, that either make the animals more tame and easier to catch, or they are used on the hunting dogs. The latter are fed to the dogs, or they are burnt and the dogs inhale the smoke in order to make them fierce, good at scenting game, or strong in the chase.

Dreams are said to foretell whether a hunt will be successful. If you dream that someone has died this means that a boar will be killed. Or, if you dream about a funeral at which many people are wailing, then this means that the dogs will scent down an animal, a parallel being drawn between wailing people and baying dogs. The converse is also believed, that if you dream of having killed a boar, this is a portent of someone's death. Furthermore, if you dream of being stung by a bee, you should not go hunting, or on any other expedition, as you are likely to have an accident.

One situation in which you will not succeed at hunting is if someone close to you has died but you do not know of this. In such a situation, referred to as *muras*, if you are out hunting then you are unlikely to encounter any animals. Even if you do, and you manage to shoot or spear the animal, then it will not die. I was told that if such an event takes place, then it is a strong indication that someone may have died and so you should return home. The same is also said to occur if you are out collecting plant resources. Whatever you are collecting, for example, honey, damar resin, or gaharu, you will be unlikely to find any, or if you do, then it will be bad. In such an event, you may also feel very lethargic and tired. One old lady told me that she once experienced this. Her sister had died in Kalimantan, but it was several days before she found out, during which time she felt weak and had no appetite.

5: 3: 2. Changing beliefs

In the past, the Lundayeh apparently followed many more taboos, and people believed much more strongly in spirits and mythical beings. Thus, people often told me how difficult the life of their ancestors must have been, because taboos and rules covered so many aspects of daily life. For example, when a woman became pregnant, a whole range of taboos were invoked to ensure an easy birth and a healthy baby. To cite just a few of these, neither the woman nor her husband could tie anything in the house during her pregnancy, nor could they eat various foods, such as bear meat, tortoise or offal. Of greatest significance in people's lives were omens, these governing all major decisions. Thus, at every stage of agriculture, before setting out on hunting expeditions or on other journeys, omens were consulted through a system of augury. These practices were based on animist beliefs. The Lundayeh believed in a spirit world, and that the spirits communicated with people through omens. Interpreting these omens, particularly through augury, was a central tenet in their lives.

The question remains as to what the various beliefs and practices of the Lundayeh tell us about their perceptions of the environment, both today and in the past. It is now impossible to gain an in-depth understanding of the belief system before people's conversion to Christianity, or to discover how the Lundayeh perceived their environment at this time. What little is known has been gleaned from the

understandings of today's elderly generation, who still remember something of these beliefs, although they were children when the Christian missionaries first arrived. However, some suppositions can be made by investigating the beliefs and perceptions of contemporary animist societies, as there is a high degree of similarity in religious beliefs between many of the societies within Borneo, and to a lesser extent, across the Southeast Asian archipelago (King, 1993; Rousseau, 1990; Seling & Langub, 1989). For example, a number of practices are found across the region, such as a taboo against mocking animals, which if breached, induces storms (Blunt, 1981: 294-299; Howell, 1989: 179-183; Kershaw, 2000: 28-29; Needham, 1964), and beliefs similar to *meketefan*, that misfortune will strike if you refuse food (Dentan, 1968: 55; Howell, 1989: 183-186; Peluso, 1996: 533). Interpretation of dreams is also widespread. Jensen (1974: 116-118) wrote that the Iban believe that dreams are one way in which spirits communicate with people. Interestingly, many of the interpretations of dreams that he records are the same as those given by the Lundayeh today.

While we must be careful not to over-interpret such data, they can give us some hints about how the Lundayeh may have perceived their environment in the past. Thus, it is possible to surmise that in the past the Lundayeh regarded the forest as both a source of material wealth and of spiritual blessings, since such a view is held by many forest-dwelling societies. For example, it has been suggested that the Kantu' undertake swidden agriculture on the basis of an exchange with the forest spirits, a good harvest depending on establishing good relations with the spirits, and so, their benevolence (Dove & Kammen, 1997: 91-92). In other words, for the Kantu', there exists a morality of exchange between themselves and the environment. There are in fact some parallels to be found between the Kantu' belief system and Lundayeh beliefs. Apparently the Kantu' believe that 'the spirits see humans the same way that humans see wild pigs' (Dove, 1993: 113). That a similar metaphor may have existed for the Lundayeh is suggested by tales about one particular spirit, the *ada' rayeh*, which is said to hunt people, just as people hunt boar. A further hint is to be found in the representation of boars by people, and vice versa, in dreams.

In contemporary Borneo, as people have undergone radical changes in belief systems and ways of life, such a conception of the forest is becoming increasingly rare. As

Michon et al. (2000: 186) describe for the Krui, today the forest 'is neither mythical nor mystical; it is no more than the domain of forest administrators'. A change in Krui conceptions of the forest has taken place as they have shifted from traditional modes of forest extraction to a more intensive system of agroforestry. While agroforests have gradually replaced 'natural' forests in terms of meeting people's material needs, they have not replaced forest in local representation systems. Consequently, the forest no longer has importance in their system of beliefs, and 'reference to the ancient myths or to forest spirits and magic is presently very rare' (Michon et al., 2000: 186). Similar changes seem to have taken place among the Kantu' in recent years. Dove & Kammen (1997) suggest that the introduction of high yielding varieties of rice is causing a change in their moral ecology, away from the morality of exchange described above. Thus, with cultivation of these varieties a good rice harvest has come to be expected as the norm, whereas previously, a good harvest was something that was only given as a boon by the spirits in exchange for people following certain ritual proscriptions.

For the Lundayeh, a shift towards a predominantly secular view of the environment has already largely taken place, a process that began with their conversion to Christianity. A major difference between their previous religion and that of Christianity is that it was closely integrated with the environment – it was a belief system in which spirits resided in the forest and in the land, and sought to communicate with people through animals and natural phenomena. In contrast, within Christianity the environment is seen as something outside the realm of the church. By the SIB church in particular, Christianity is regarded as separate from the reality of every day life, being more concerned with people's souls and the coming of Christ than with the here and now. Consequently, these beliefs do not directly influence people's perceptions of the environment, nor how they interact with it. No link is made between the Christian ethos and stewardship of the environment for example. Furthermore, there exists an attitude that there is no point in worrying too much about the future, because Christ may come again, and with this, the end of the world.

Appell (1997: 90) has described how the conversion to Christianity of the Rungus of Sabah led to a 'replacement of the traditional spiritual perspective toward the

ecosystem with a materialistic and economic one.' He suggested that this led to a much more casual attitude to life and the natural world, as reflected in the cessation of practices such as the worship of rice spirits, and protection of sacred groves – there was a 'loss of reverence for life, specifically for the natural world' (Appell, 1997: 91). I would suggest that the same occurred among the Lundayeh on their conversion to Christianity. Today, this process is being exacerbated as the Lundayeh experience other social and cultural changes, something I expand on in the following section. Thus, people are becoming increasingly sceptical about the existence of various mythical creatures and spirits, and more and more people are happy to ignore certain taboos. Furthermore, the tendency is to view the forest purely in economic terms, as a resource to be exploited. If ever there was a morality of exchange between the Lundayeh and their environment, there is little evidence of it today.

In spite of all the changes that have taken place in the last century, there is some continuity. For example, although fear of spirits and belief in mythical creatures is declining, it still exists and is strongly felt by some. Indeed, the forest is still regarded with some fear by the Lundayeh, something that is reflected in their various tales and myths, and in people's belief in phenomena such as *meketefan*. However today, rather than seeking to avoid misfortune through augury, and to avoid encounters with spirits and mythical beings through avoiding taboos, people use prayers and believe in the power of the Christian God.

5: 4. Alternative and conflicting views of the landscape

In the introduction to this chapter I highlighted the fact that there is no one Lundayeh view of the landscape. Rather, there are various perspectives. The reason for this variation lies in differences in the way that people engage with their environment. This became apparent as I talked to people about the landscape, and also, observed their behaviour. More concrete evidence came from the workshops and mapping exercises (described earlier). These highlighted variations in perceptions among the Lundayeh, and also, enabled comparison between the views of local people and outsiders.

5: 4: 1. Variations in perception among the Lundayeh

I will begin by considering differences in perception between men and women. That such differences exist is suggested by the results of both the mapping exercises and the village workshops. Turning to the maps (figures 5.3-5.6), the differences between those of the men and women are immediately apparent. In both villages, the women drew maps that depicted quite small areas, these indicating the most important sources of vegetables. In contrast, the men's maps were more extensive, covering a much larger area, and including information about hunting as well as place names[14]. When I asked the women about place names, in both villages they told me that I would be better off asking the men for this information, and subsequently, only a few sites were named on the womens' maps. These findings suggest that men and women have somewhat different perceptions of their environment. This is not surprising, given the different responsibilities and subsistence activities of men and women. Thus, it is the women who are primarily responsible for collecting vegetables, and rarely do they venture far from the village or fields. A few women have been far upriver, to participate in fishing trips. In addition, women occasionally make up part of a group walking to Indonesia or Sarawak to visit the villages there, although usually it is young men that undertake such trips. In contrast, men are frequently in the forest. The most common reason for this is hunting, for which they may spend many days away from the village, travelling far into the forest. Once again there are exceptions – there are some men who go hunting every week, while others are not interested, either preferring fishing or to concentrate on farming or wage labour. Generally though, in comparison to the women, it is the men who spend more time in the forest and venture further afield. Consequently, it is the men who are more knowledgeable about the forest and the surrounding area.

This contrast between men and women was also apparent from the findings of the workshops. Not surprisingly, when asked to identify the values of the forest, the women highlighted those associated with how they themselves use the forest, for example, as a source of leaves and vegetables, for craft materials and for potential agricultural land. Similarly, the men prioritised those uses with which they were most directly concerned, such as hunting, construction materials, as a source of fish

[14] As explained previously, not all of the river names given by the men are shown in figures 5.3 and 5.4.

Figure 5.3: Resource-use map drawn by the women of Long Mio

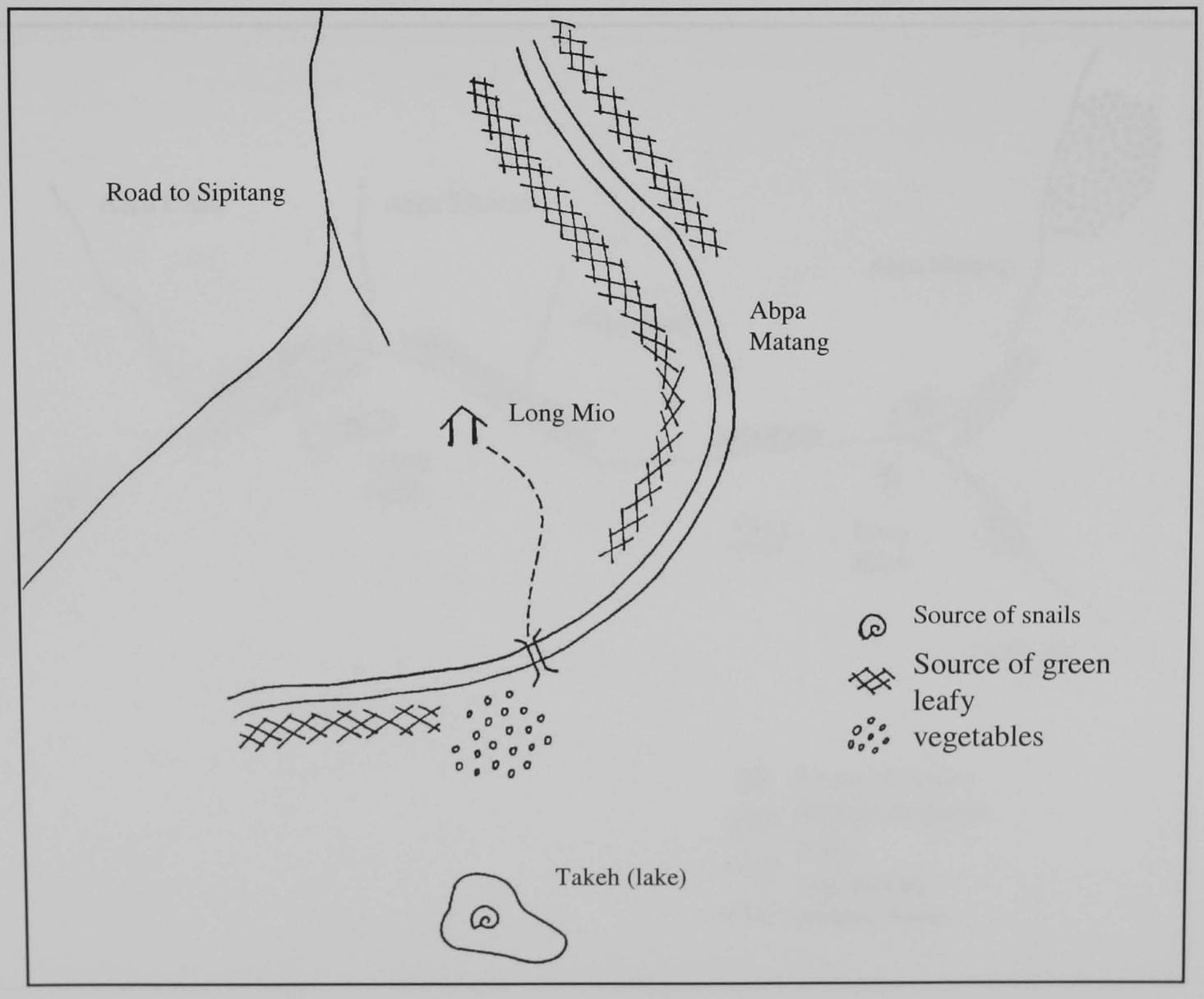


Figure 5.4: Resource-use map drawn by the women of Long Pasia

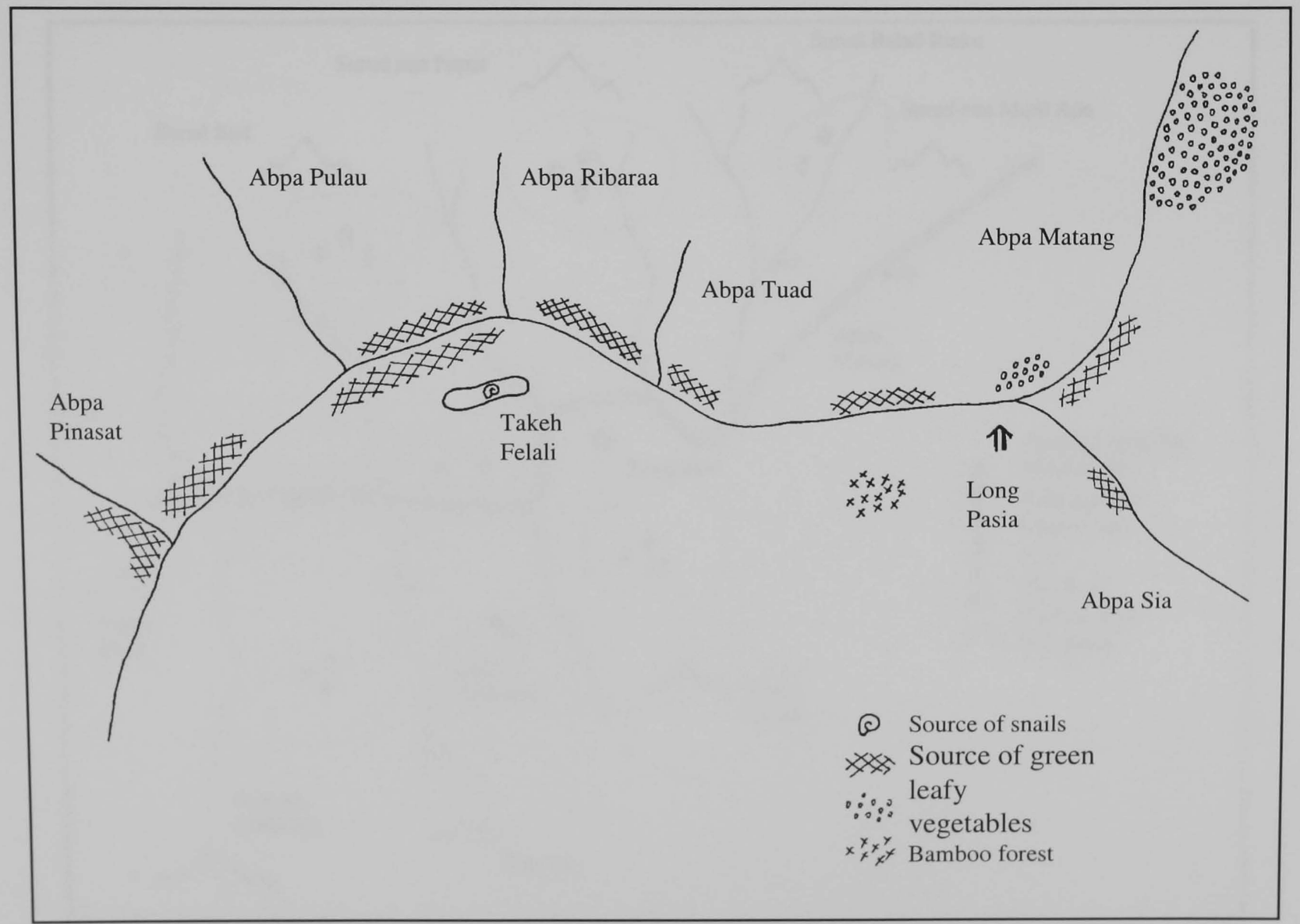


Figure 5.5: Resource-use map drawn by the men of Long Mio

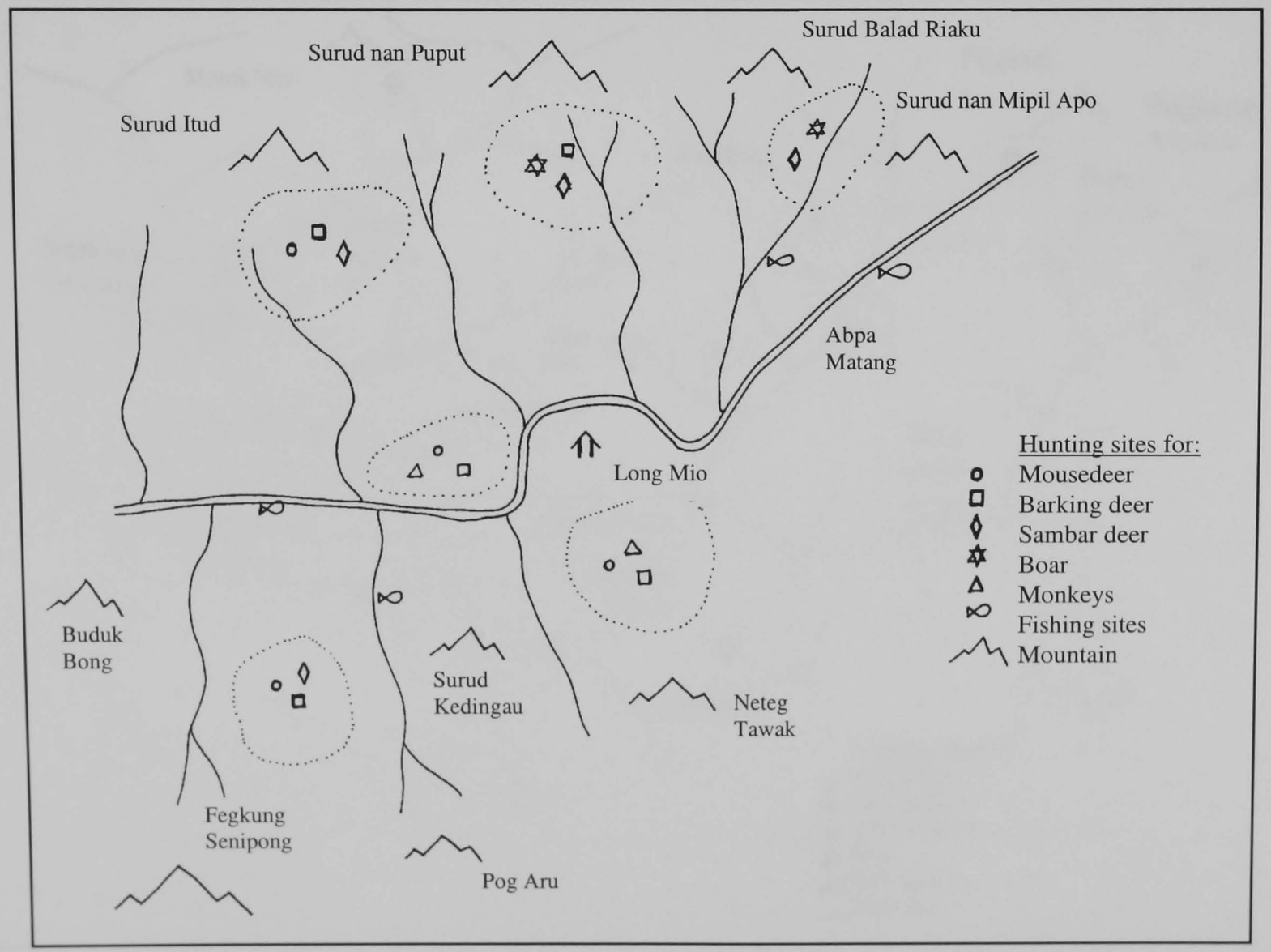
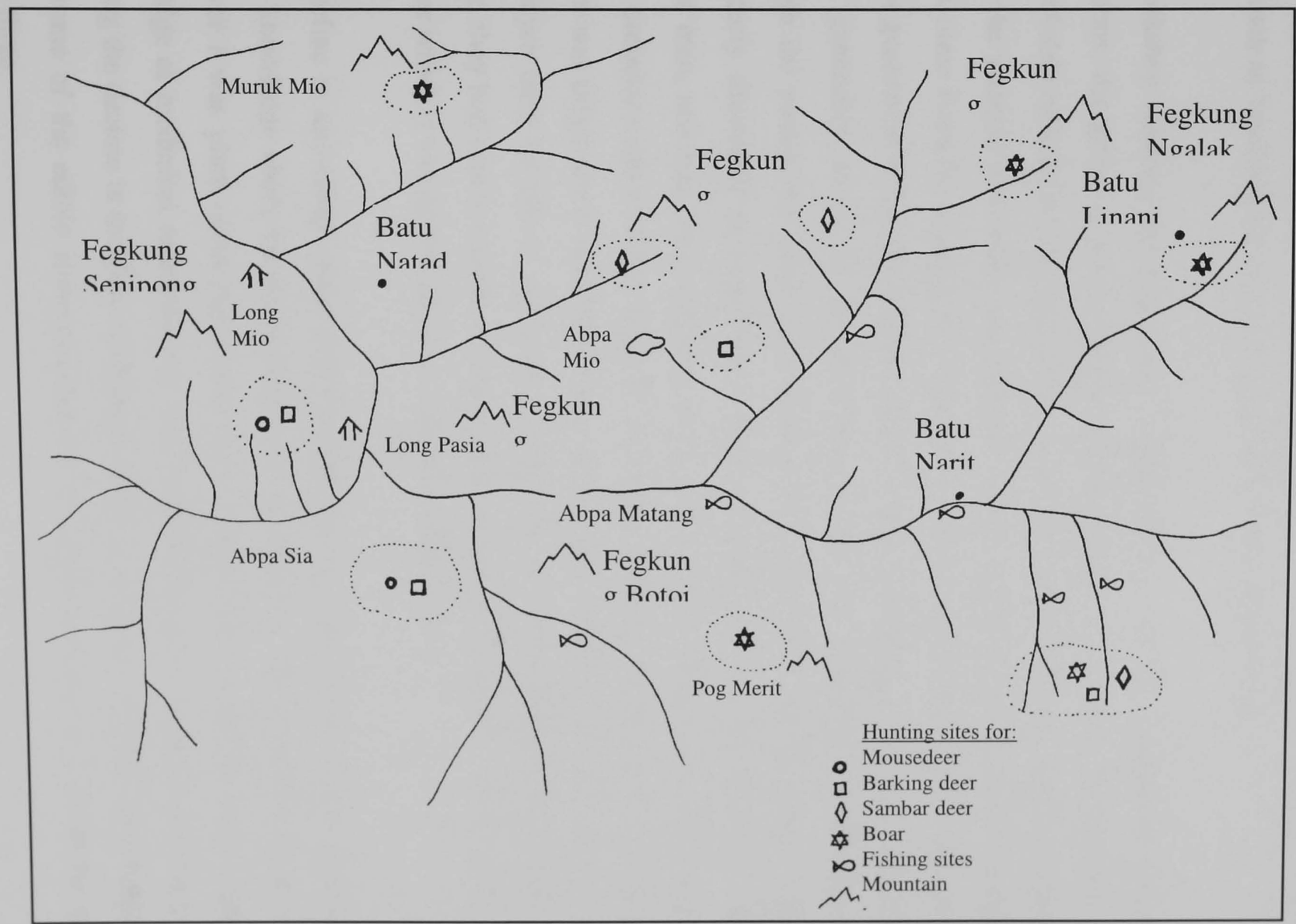


Figure 5.6: Resource-use map drawn by the men of Long Pasia



and land. The men listed many more uses than the women. This probably reflects the fact that it is the men who have most contact with outside parties, such as WWF and government departments. Consequently, they tend to have a better awareness of the range of issues at stake. For example, only the men made the link between the forest and the weather. In addition, they alone highlighted the non-subsistence values of the forest, such as 'tradition and origins', gravesites and legendary sites.

The workshop findings also suggested a difference between the younger and older generations, the group of young people listing relatively few values for the forest. This probably reflects the shift away from a forest-based lifestyle that is taking place among the younger generation, as I discuss in more detail below. Further evidence for this came from the mapping exercises, from which it became apparent that the younger generation is less knowledgeable about the landscape. For example, only the elderly generation knew all the place names, and the meanings behind these. Although the young men knew most of the names, few knew their meanings. This was clearly illustrated in Long Mio where the map was initially drawn by the younger men, and then later corrected and added to by the older men. There were several omissions and mistakes made by the former, for example, the name of the hill *Pog Aru* was originally given as *Pau Garu*. The young men did not know that *pog* is a Lundayeh term for hill, as this word is no longer in use. Perhaps because of this mistake, they had also not made the connection between the name of the hill and the tree after which it was named, *kayu aru* (*kayu* meaning tree).

This decline in knowledge about the landscape seems to be part of a more general loss of knowledge about the environment and its resources. This was also apparent whenever I was plant collecting or out in the forest. Thus, I became aware that knowledge of medicinal resources was very limited among the younger generation, reflecting the decline in their use. Similarly, most young people had little knowledge about some of the edible resources that are no longer utilised, as I described in chapter three.

It is not only knowledge about particular resources that is being lost, but also more general ecological knowledge. For example, many young people do not know the food plants of game animals, nor are they knowledgeable about animal behaviour,

for example, that animals frequent salt licks during drought periods. I suffered the consequences of this when trying to witness fish spawning. On two trips organised by some of the youth of Long Pasia I waited through the night for this to take place, but without success. It was later suggested to me that this was because we had set up drag nets (*pukat*) downriver from the shallows where the fish were expected to spawn, something that was known (at least by the more knowledgeable villagers) to disturb fish spawning.

Another kind of knowledge that is being lost is that embedded in oral literature – myths and legends, as well as tales of the history of the landscape and of the Lundayeh people. The only people who could recite Lundayeh myths, lullabies and stories were the very elderly generation. This kind of knowledge is today held by only a few people: just one person in Long Mio, and nine people in Long Pasia, three of whom died during my year there, were knowledgeable about this aspect of the Lundayeh culture. As I described earlier in this chapter, oral narratives can shape people's perceptions of their environment. Indeed, many of the Lundayeh myths and stories relate to the landscape or to particular plants or animals. Nabhan & St. Antoine (1993: 244) suggest that such narratives can provide a unique kind of knowledge about the environment. This is because they do not simply convey information, but also provide a stimulus for the imagination, and furthermore, may engender particular feelings and emotions. Consequently, they can be powerful tools for communication (Basso, 1990: 144).

Typically then, the younger generation has a less in-depth knowledge of the environment, both with respect to its ecology and its cultural history. The reason for this is that there has been a change in the way of life, something that is leading to an 'extinction of experience' (Nabhan & St. Antoine, 1993: 239). This term was coined by the ecologist Robert Pyle to refer to the phenomenon of the loss of direct, personal contact with wildlife. He suggested that the consequences of this are that people feel a lack of concern towards the environment. There are various reasons why an extinction of experience is taking place among the Lundayeh, which I will consider in some detail.

Today, many of the younger generation are keen to take up wage labour, or to concentrate on cultivation of cash crops. For the former, many go off to logging camps, or go to work in the towns. This is not a recent phenomenon, with men having gone off to seek employment for at least the last 40 years. There are in fact a significant number of elderly people who have spent very few of their adult years living in Long Pasia. 16 heads of households (out of a total of 65) have followed long careers elsewhere, for example, in the army, logging companies and the church, returning to Long Pasia on their retirement. However, it is becoming more common for people to seek work outside the village, as people's needs for cash have increased, and as people have become more aware of other opportunities. Consequently, there are many young people who have never followed the traditional way of life of swidden agriculture.

Another factor is that more and more children are continuing to secondary school and reaching senior years. This means that they are spending less time in the village, and also, that their aspirations are changing. After school, many do not wish to become farmers, but rather, to get office jobs. Consequently, when they do return to the village during the school holidays, many of the children are not interested in following their parents to the fields or going on hunting trips. Many of today's school-age children have never seen the fish spawn, nor spent a night in the forest. The forest and environment is no longer of central importance in their lives, and so, there is less incentive to learn about it. Such children are unlikely to form any particular attachment to the forest, since it holds little personal significance for them.

Even for those who do stay in the village and work as farmers, the system of agriculture has been subject to much change in recent years. As I described in chapter two, there has been a shift towards more permanent agriculture, cultivation of cash crops, and increased privatisation of land. Furthermore, much of the Ulu Padas forest has been designated for logging, and large areas have already been logged. As a result of these changes, land and forest resources are increasingly being seen as a limited resource, and furthermore, as commodities. This is being reinforced by people's need for cash income, and also by the views of outside parties (as I discuss in the following section). Such changes have been noted by researchers elsewhere. For example, the Nuaulu are apparently adopting a more reified and

commodified view of the forest in response to similar land-use and environmental changes (Ellen, 1999a).

The trend away from a forest-based lifestyle is being further encouraged by the onslaught of logging. This is for two reasons. With the decline in the forest, certain resources are becoming harder to find. For example, I was told that some rattan species used for weaving are now scarce, such as *wei darii* (*Calamus javensis*) and *wei kurad* (*Daemonorops longipes*). Of greatest concern to people is the decline in animal numbers, particularly of boar. With fewer animals to be found, people go hunting less frequently because it is not worth the effort if there is a high chance of coming home empty handed. For the same reason, a few people told me that they no longer keep hunting dogs because they are not worth the expense.

An additional impact of logging has been the development of a road network. The establishment of a good road link to the villages in 1997[15] meant that purchased goods became much more readily available. These goods are gradually replacing forest products. For example, plastic materials are now often used for weaving instead of rattans and bamboos. Some food resources are also being replaced by shop-bought goods, a trend that I described in chapter three. As people are becoming less reliant on forest resources for their subsistence needs, they have less reason to go out into the forest.

Improved road transport also means that people no longer need to walk. This not only reduces the degree to which people interact with the environment, but also the way in which this interaction takes place. The first time people took an aeroplane from Long Pasia and were able to see their village and the surrounding forest from above would undoubtedly have had a dramatic effect on the way in which they perceived their environment. Use of aeroplanes gives people a bird's-eye view of the landscape, and also effectively brings places closer together because of the shorter travelling time (Ingold, 2000). In the same way, the network of roads is having a profound impact, allowing rapid movement and easy access to previously remote areas. In the year of my fieldwork, the road network extended upstream of Long

[15] Prior to this date the road reached as far as Long Mio but was poorly maintained. Consequently, the journey remained difficult, and was impossible during rainy periods.

Pasia, and now reaches as far as the border with Kalimantan. One consequence of this is that people no longer see the forest as such a vast and mysterious place. For example, people are now less fearful of ghosts and spirits, which they say have retreated because of the disturbance and noise in the area. Another consequence of the increase in travelling by road is that people become more cut off from the forest, since they no longer have to walk through it. All journeys to Sipitang are made by road, and it is now possible to reach Long Semado, the nearest Lundayeh village in Sarawak, in a day and a half by road. From here, villages in Kalimantan can be reached by motorbike, when there has not been too much rain. Some hunting trips now take place entirely by car. Many animals come to eat the roadside vegetation, and so it is possible to simply drive along the road and hunt from the car, using a strong lamp to pick out the animals.

The consequences of a shift from forest trails to roads are clearly illustrated by contrasting two journeys that I made. One was a trip on foot to Long Semado, and the other was a trip (one of many) by car to Sipitang. On the former journey, as I described earlier in this chapter (in section 5: 2), much of the time was spent recounting previous trips that had been made along the same route in times past. Furthermore, as we passed places of particular significance, these were pointed out and their stories told. For example, *Batu Narit* lies along this route, one of the large rocks carved by the legendary figure of Upai Semaring. Many natural resources were also pointed out, such as various edible fruits and fungi, plants used as charms, and so forth. Although much of this information was imparted for my benefit, because people knew of my interest, this was not an entirely artificial situation. It is in such a way that people often pass on knowledge to their own children (Nabhan & St. Antoine, 1993). I observed this myself, but it was also highlighted in discussions in the villages. Thus, people suggested that one of the main reasons for the younger generation's declining knowledge about the environment and, more generally, of Lundayeh culture was because children rarely go out into the forest with their elders.

In contrast, my trips to Sipitang did not evince the same response. Although I often learnt a great deal from discussions held in the back of the truck, this was more usually the latest village gossip, or market prices of goods. Even when we touched on topics related to the forest and the landscape, these did not stick in my mind in the

same way. Learning about something, whether it is a myth, local history, or ecological knowledge, is more meaningful when this takes place within its appropriate context, rather than learning about something in the abstract (Nabhan & St. Antoine, 1993). Thus, I can remember the story of a ghost that was said to haunt the very place where we were camped for the night. Similarly, being told the story of a wedding party's trek to Long Semado while we were walking the same route made this tale particularly evocative. This is not simply because the lessons taught are more memorable, but also because 'one can begin to apprehend the world for oneself' (Ingold, 2000: 145). Knowledge is not simply passed on but it is also generated as people interact with and investigate their environment. For this reason, as people become increasingly cut off from their environment, there are fewer opportunities to learn about it, and as described earlier, there is an extinction of experience. The consequences of this are a loss of knowledge, in particular the loss of 'traditional' and local ecological knowledge.

Other factors have also had a role in further distancing people from their environment. An increase in formal education has had a significant impact, as has increased contact with the outside world and with people from other cultures. One consequence of these changes has been loss of language. Many of the children are no longer fluent in Lundayeh, with some parents only teaching their children Malay, to try and help them do well in school (where all lessons are taught in Malay). Even the younger adults are not truly fluent, and often speak a mix of Lundayeh and Malay. One consequence of this is that the children cannot communicate freely with their grandparents, some elderly people being similarly lacking in Malay language skills. It is these very elderly people who know the traditional tales and myths. Furthermore, many of these are told using archaic language, which few people now understand. The loss of language hinders the communication of a society's oral tradition, not only because the holders of this knowledge may not be fluent in the new language, but also because certain meanings may not be easily expressed in another language, for example, there is no Malay word for *meketefan*. In translation, secondary meanings, metaphors or inferences, that may be an integral part of a myth, a place name, or perhaps a plant name, are usually lost. The pervasive effects of language loss are illustrated by the example cited earlier of the hill known as *Pog Aru*. As Maffi (2001: 414) has highlighted, a people's own language has a crucial

role 'in creating, encoding, sustaining, and transmitting... cultural knowledge and patterns of behaviour'.

One factor that has had a major impact on the transfer of knowledge in recent years has been the arrival of television. Televisions were the consumer item in greatest demand during my year there. When I first arrived, two families in Long Pasia and one Long Mio family had televisions to watch videos. In addition, there was satellite TV in Long Pasia's village hall, allowing reception of Malaysian TV and some satellite channels. By the end of my time there, Long Mio also had satellite TV, as did two other families in Long Pasia. In the two villages, an additional 10 families had their own videos. Television influences people's knowledge about their environment in various ways. Firstly, people now spend many evenings watching TV (action movies, Hindi films and wrestling being the viewing of choice) rather than sitting around talking. This decline in socialising is not an entirely new phenomenon. Many people told me that this began when people started living in individual houses. People would often reminisce about the time when they were children, when they were still living in longhouses, and how the evenings were usually spent gathered round the fireplace, telling stories, discussing news and so forth.

Television can also reduce the time that people spend outside. This took place very noticeably in the first few months after Long Mio had installed their satellite TV. During this time, the village children spent every afternoon watching TV, often until the power ran out. (This continued until the adults decided to lock the village hall in the daytime.) By reducing the time that children spend outside, TV effectively discourages them from investigating their environment and gaining their own experiences within it (Nabhan & St. Antoine, 1993). Another consequence of TV is that it makes people aware of other worlds, ways of life, and values. This growing awareness is also taking place because of increased contact with the outside world, with people going to work in towns and travelling more widely. More people are also coming to the villages, with regular visits from government officers, representatives of WWF, and researchers and tourists from Malaysia and overseas. This has raised awareness of how other people view and value their environment and way of life, something to which I now turn.

5: 4: 2. Outsiders' perceptions

Rights to land and forest were a highly contentious issue during the time of my fieldwork, with disputes between logging companies, the two villages, WWF and the state government. In the discussions and debates about these issues (held in official meetings, around fireplaces in the evenings, in the back of the truck on the journey down to Sipitang...) the different ways in which these parties perceive and value the Ulu Padas and its forests became apparent. Analysis of these various perceptions is of great importance because of their role in shaping and rationalising policies about management of the environment. As Zerner (1996: 69) has highlighted, 'when stories about nature and the human community are linked to power and funding, they have important ethical, political, and legal consequences.' Here then, I will consider some of the 'stories' constructed by the main outside stakeholders in the Ulu Padas, and see how these have shaped policy. Also of interest is the impact that these alternative views seemed to have had, or to be having, on local perceptions. There are a number of outside parties that have a direct interest in the Ulu Padas, namely the Sabah government, logging concessionaires, conservationists and researchers, and tourists. These various groups each have a particular perspective and agenda regarding the Ulu Padas, and I will consider these in turn.

5: 4: 2: 1. The view of loggers and Government

Logging concessionaires have a very narrow perspective of the environment, viewing it purely as a source of timber (and revenue), and then, as land for plantations. This is somewhat predictable, but what is of interest is the impact such a perspective is having on the way that the Lundayeh view their environment. Most significantly, the interest of the state and logging companies in the region's timber has brought home the fact that not only is the forest a limited resource, but also a very valuable one. Consequently, local people have come to regard the forest more as a commodity. This shift in perspective is being exacerbated by the decline in contact between the Lundayeh and their environment, described in the previous section.

The views of the Government are more complex, as is suggested by the number of departments with which it is represented in the Ulu Padas. These include the

Departments of Land and Surveys, Forestry, Agriculture, Rural Development and the Ministry of Tourism, Environment, Science and Technology. Clearly, the priorities of these various departments differ, and I will only highlight those of the two departments that attended the WWF workshop. The official mission of the Department of Forestry is the sustainable development of the state's forests. However, it is primarily interested in the production of timber, with one of its aims being to 'optimize forest resource utilization and revenue collection'. The remit of the Ministry is very broad, but conservation is a priority, as is economic development through tourism. The Ministry's stated mission is as follows: 'To encourage and promote the orderly development of the tourism industry in the State. To protect, conserve and preserve the natural beauty of the environment in its natural state.' [16]

The priorities of the Government as a whole were perhaps quite accurately summarised by the representatives in the workshop. These were: to improve the economy and encourage local development; to undertake research; and to conduct conservation activities. Thus, the Government's perspective can be equated with the goal of striving for 'the greatest good for the greatest number of people'. This phrase was coined by an American forester (Gifford Pinchot, quoted in Peluso, 1992: 7-8), and it neatly sums up an attitude that has pervaded forestry policy throughout the world. Thus, the appropriation of large tracts of land for forests, plantations and 'development' projects by states has often been justified by claims that such changes are for a greater good. In the case of Sabah, this is reflected in government policy which is primarily directed towards the mining of natural resources to fund economic development at the state level, and the expansion of plantations and intensive agriculture. Furthermore, the arguments that are most readily accepted by government for conservation of natural resources are those that highlight economic reasons, for example, as potential for new medicines, a resource for the tourist industry, or for the protection of watersheds.

There are various problems with an approach that strives for 'the greater good', even ignoring the prevalence of corruption, in which individual self-interest over-rides any such attempts. Most fundamentally there is the problem of deciding just what is the

[16] These quotes, referring to the aims and missions of the various Government departments, were taken from the official Government website: www.sabah.gov.my/adminstructure/brministry.asp

greatest good, and what course of action will produce this. As Peluso (1992: 8) highlights, those people living in the forest areas 'might have radically different definitions of the greatest good and common interest.' Furthermore, such policies have resulted in forest people being denied the right to participate in forest management. Instead they have been regarded as 'squatters on state lands and plunderers of state riches' (Michon et al., 2000: 164). Not only does this deny them access to the land and resources, but it also denies local people's history in the land, their knowledge of the environment, and their ability to manage it themselves.

All too many examples of such attitudes are to be found in the literature for Borneo alone (Dove, 1986; Fried, 2000; Peluso, 1992) and Sabah seems to be no exception. Thus, in justifying logging activities, the Government argues that the forests belong to the state, and so should be used to generate state revenue. On this basis, Sabah's lands have been divided up into various units for 'management'. The map in figure 1.2 shows the zoning of the Ulu Padas. This process was undertaken with little local consultation, clearly demonstrating that local people are not seen to have any prior claim to forest resources or to land.

Most of the Ulu Padas area (which covers approximately 80,000 hectares) has been designated as Commercial Forest Reserve, which means that it is for the production of timber. The land immediately surrounding the villages (an area of 12,300 hectares) is defined as State land. This designation means that people can apply for title of this land. Although local people are given priority in their land applications, these are limited to 20 hectares for each individual. Beyond this, no rights are recognised. The official stance is reflected in the statement of one government forester, who told me that rural people are treated very generously by the state because they are able to apply for land in this way. Thus, he held that the people of Long Pasia and Long Mio should be grateful, because there is such a large area of land surrounding these villages which they can apply for, in contrast to those people living in town for example. This situation with respect to land tenure has further exacerbated the commodification of the environment. The premium that has been placed on land has meant that the forest has become something to bargain with – people making deals with timber companies in order to attain land title. I talk about this further in chapter six.

5: 4: 2: 2. The view from conservation

WWF has been active in the area since 1997, and has initiated various research projects in which it has been working with other local research and development institutions. In this work, WWF is striving to meet both the interests of wildlife and of local people, i.e. to integrate both conservation and development. Therefore, as well as lobbying to reduce logging in the region, it has been working with the community on land rights issues and in developing tourism (Payne & Vaz, 1998; Vaz, 2000).

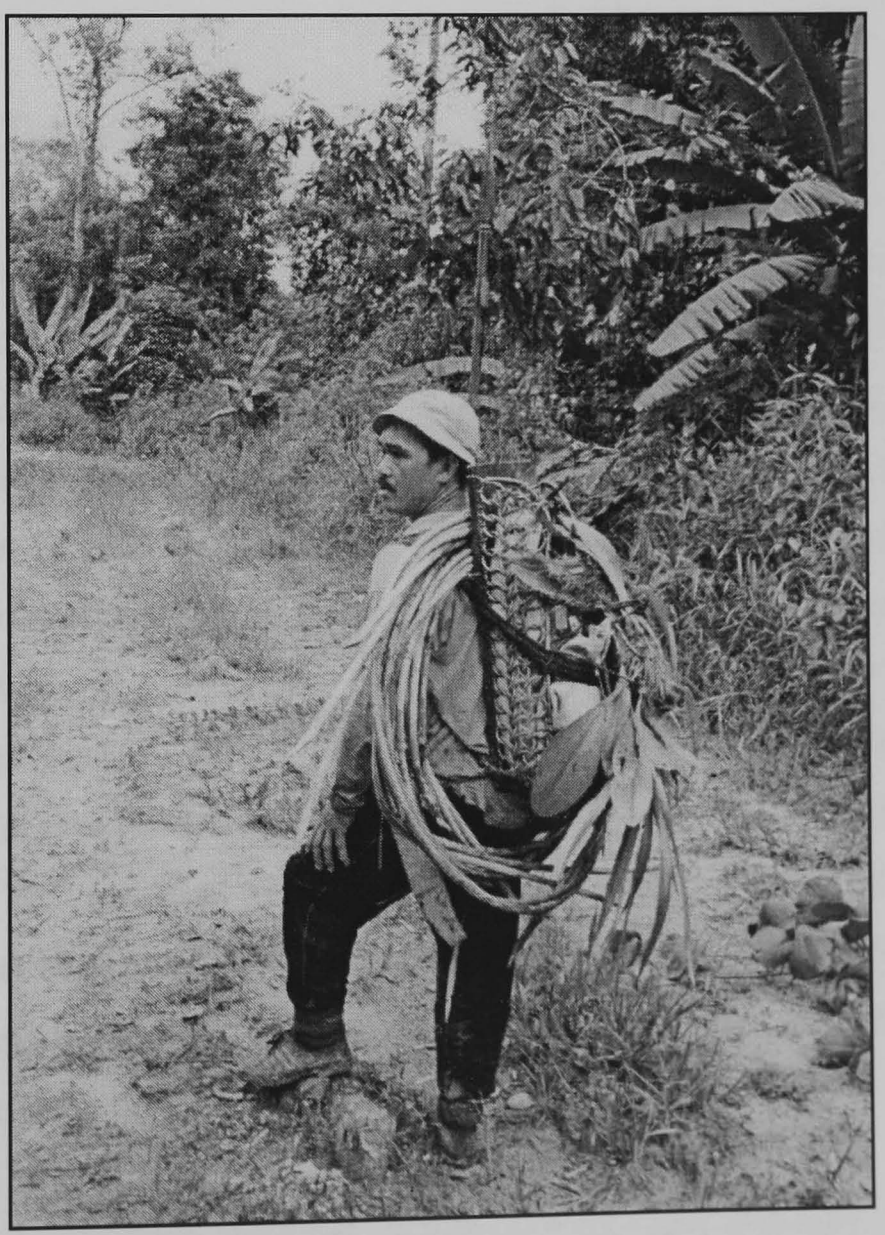
WWF's attempts to integrate local people's needs in their work is indicative of a general trend within conservation (Larson et al., 1998; Wells & Brandon, 1994; Western & Wright, 1994). Previously, conservation was based on an ideal of wilderness environments, on which it was presumed people had had little influence (Gomez-Pompa & Kaus, 1992). Consequently, the predominant model within conservation was to establish protected areas from which people were excluded. That conservationists began to take people into account in their projects stemmed largely from the recognition that conservation cannot be successful without doing so. It also reflected a shift in perspective, away from one dominated by an ideal of a wilderness, to one in which cultural landscapes are recognised. Consequently, the idea of including people within conservation projects became conceivable, since it was recognised that people are not necessarily a destructive force, and that they may in fact have a beneficial impact on their environment (Fairhead & Leach, 1996; Redford & Padoch, 1992)[17].

In spite of this shift in perspective, the main aim of WWF remains the conservation of biodiversity, and this has to be the ultimate goal of any of its projects. WWF is interested in working in Ulu Padas primarily because of its biological diversity and unique mix of forest types, and so this aspect has been highlighted in project reports

[17] There has been something of a backlash against this approach in recent years. The failure of some community-based conservation projects to achieve their goals has raised questions over the efficacy of such an approach, leading to suggestions that conservation should once more give priority to protected areas. See Wilshusen et al. (2002) for an overview of this debate.

and in applications for project funding. As Zerner (1996: 73) has noted, such a narrative can serve to create, or reinforce, a perspective in which biodiversity is privileged over local people. Local people have become aware of the value that many people place on the diversity of plants and animals found in the region. These values are not important locally, although a WWF orchid project has contributed to a growing interest in collecting these plants as ornamentals within the villages (plate 5.6). However, awareness of conservationist views, and also of the nature of conservation projects elsewhere in Malaysia, has raised concern locally that WWF is primarily interested in creating a protected area to which local people will be denied access.

Plate 5.6: A man returning from an unsuccessful hunting trip, carrying rattan stems (for weaving) and orchids (to plant around his house)



Not surprisingly, conservationist arguments that hold more resonance locally are those more closely tied in with functional values. People have long known of the importance of the forest in sustaining the wider environment, for example in maintaining healthy rivers. This has become all too apparent for the Lundayeh as they have been experiencing first-hand some of the consequences of logging, including river pollution. One particular impact of WWF has been to raise awareness locally of the lobbying power of these issues, with the wider Sabah population, local politicians, and overseas. For example, flooding is a serious problem in the lower reaches of the Padas river and in many parts of Sabah, and after every flood questions are raised in the newspapers about logging and watershed protection. Increasingly then, local people have been employing conservationist arguments in their struggle with the Government over logging in the region, a trend I discuss further in chapter six.

5: 4: 2: 3. 'The Tourist Gaze' (Urry, 1990)

The remaining group of 'outsiders' that I wish to discuss are tourists. Tourists, from Malaysia and overseas, have been coming to the area in small numbers for several years. Since the road reached Long Pasia, and particularly since its improvement in the last few years, some large groups of local tourists have also been visiting the villages. Typically, they go trekking in the forest, on boat trips, or some groups offer medical or other services. Long Pasia is well known within Sabah. One reason for its fame is that about 10 years ago, when MAS (Malaysian Airlines Service) still ran a flight to the village, a photograph of Long Pasia was used in one of its advertising campaigns. This image in particular has contributed to a perception that the area has a 'pristine' landscape, in which the local people live in relative isolation from the modern world. This has been further encouraged by recent newspaper articles, which appeared as part of a campaign against logging in the area (figure 5.7). Typical of these is an article entitled 'Long Pasia – Eden of Borneo' (Teo, 1999), in which the following description is given:

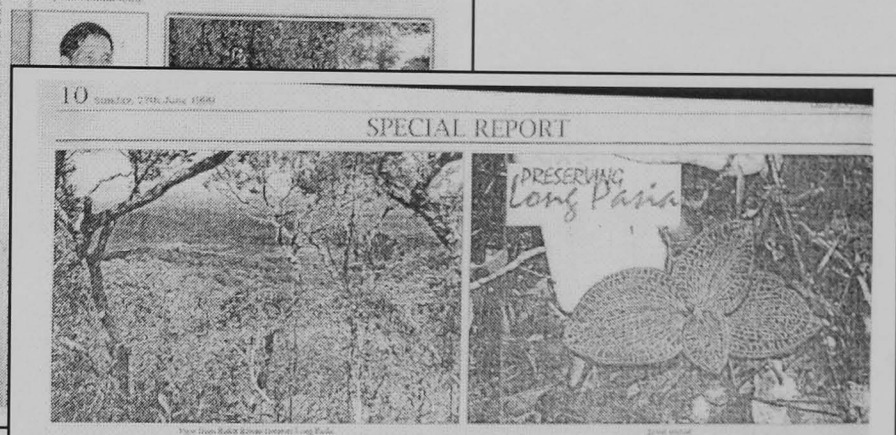
> 'Here is a place in Sabah which one can truly call "The Eden of Borneo". This is the place where Henry can call his barking deer at will by whistling with a blade of leaf... or place his hand into the shallow water under the rocks to catch his "pelian" fish.'

Figure 5.7: Newspaper articles on the Ulu Padas

Paradise under threat

Promoting ecotourism may well be the answer to counter threats from logging at Ulu Padas, the picturesque highlands in the south-western tip of Sabah, writes JASWINDER KAUR, who trekked its rugged mountains for a week recently.

MAP OF ULU PADAS



10 Sunday, 27th June 1999

SPECIAL REPORT

PRESERVING Long Pasia

Long Pasia — Eden of Borneo

By ALBERT TEO

Natural treasures of Ulu Padas

Besides diverse plant and animal species, other treasures in Ulu Padas in the southwest Sabah includes waterfalls, archeological sites, stone caves and even a highland lake.

DAWATAN ... discovered the lake

AMERICAN

NEW STRAITS TIMES

ENVIRONMENT

Legend of Lun Dayeh

The Lun Dayeh people, according to legend, are descended from the union of Rang Dango who lived alone until he found his mate, a woman called Terur Eco or the Sun Egg.

STILL ACTIVE ... Biet Udan, with grandson Gary, is still vivacious in her 60s

SOURCE OF FOOD ... Richard fishing in the Pasia River

Such a view is also promoted overseas. In seeking to attract tourists to Sabah, campaigns often make reference to the State's cultural diversity. For example, during the time of my fieldwork, a Japanese film-crew spent several days in the village filming 'traditional' Lundayeh activities. For this, villagers made bamboo implements (which have not been used in decades) and wore their traditional clothes (which are only used on special occasions). These shots were to feature in a film being used to promote Sabah as a holiday destination. Furthermore, in the year 2000, Sabah was being marketed as 'the tropical rainforest destination' and in 2002, as the 'land of mystery and natural wonders'. These images are clearly appealing to popular western perceptions of the tropics, as typified by lush environments, biological diversity and edenic locations (Arnold, 1996; Grove, 1995; Putz & Holbrook, 1988).

With such expectations, many tourists, both Sabahan and Western, have been surprised and disappointed at the reality. Visitors to Long Pasia commented to me that they were surprised at how 'developed' the village is, with solar power, good quality houses and so forth. (Hence some of the inappropriate activities of a few groups of visitors, such as bringing second-hand clothes to distribute.) Many were also shocked at the extent and methods of logging.

The Lundayeh are well aware of the contrast between their own perceptions and those of many of the tourists. For example, they tend to be somewhat amused, if not bemused, by the value placed by many Western tourists on wildlife, for example, many visitors prefer not to eat hunted meat. Similarly, they note people's interest in charismatic plants such as orchids. Local views of the environment and landscape are being influenced by such perceptions. For example, the interest of tourists in their environment has raised awareness of the significance of their environment both locally and for the whole region. This concern is something that the Lundayeh have sought to tap into, to gain support in their campaigns against some of the logging activities. However, the differences between their own perceptions and those of outsiders is also of some concern to the Lundayeh. This is because of the feeling that their own interests are regarded as secondary, both to those concerned with conservation of the area, and to those of the logging companies and government. Previous experiences of having been excluded from many of the decision-making

processes regarding management of the Ulu Padas have contributed to a feeling of helplessness, and to a view that their future is a precarious one.

5: 5. Conclusion

The Lundayeh view of the forest is changing. As the forest is being logged over and criss-crossed by roads, it is no longer seen as something vast and unlimited. Neither is it held in awe. In the past, the forest and the spirits and ghosts that lived within it were feared and respected. However, as people have more contact with outsiders who do not believe in the *galau* or *semilig*, or are not scared of spirits, so the forest is becoming a less fearful and mysterious place. It is also becoming a more uniform place, one that is not specifically a Lundayeh landscape. This is in part due to changes in beliefs, but also because of a shift away from a forest-based life-style.

One consequence of these changes is that the forest is increasingly being perceived as a 'wilderness'. Because people no longer interact with the forest, they do not feel connected with it. Ellen & Bernstein (1994: 18) reported similar findings for the Dusun in Brunei, where a shift away from a forest-based life-style has meant that the 'richly complex and culturally very different meanings of 'forest' have been progressively rejected'. It would seem that the same is happening in the Ulu Padas. The forest and landscape here is seen less and less as a specifically Lundayeh landscape, and increasingly as a separate entity. Consequently, it has also become something that can be exploited or bargained with. This has been further encouraged by the fact that this is how it is viewed by the Government and logging companies.

These changes also reflect a shift in the perceived balance of power between people and the forest. This has occurred because of the destruction of the forest through logging, changes in beliefs, and because of increased contact with the outside world. With more exposure to other societies and the wider world it has become apparent that man can have, and is having, a profound effect on the world. This has inevitable consequences for the way in which the Lundayeh see themselves and their society.

CHAPTER 6: BETWEEN CONSERVATION AND DEVELOPMENT: CURRENT DILEMMAS FACING THE LUNDAYEH

6: 1. Introduction

In this final chapter, Lundayeh attitudes towards conservation and development are examined. I show how attitudes are changing in response to changes in their way of life and environment, and with increased contact with government, conservationists and other groups of outsiders. The reason for focusing on conservation is because of its relevance for the Lundayeh today, who are currently experiencing drastic environmental change. Consequently, the Lundayeh face a conflict between their desire for conservation – both of the environment and of their way of life – and for development. In this chapter, I show how particular decisions made by the people of Long Mio and Long Pasia reflect the compromises that they are making between beliefs, economic needs, political gains, and cultural aspirations. I conclude by drawing together the main findings of my research.

6: 2. Local people as conservationists

In recent years, there has been growing recognition of the need to involve local people in conservation projects (Agrawal & Gibson, 1999; Western & Wright, 1994). One argument sometimes used in support of such an approach is that local people are themselves good conservationists. While this is often true, some conservation professionals have at times been overly eager to assume that local people, in particular indigenous peoples, are intrinsically conservation-minded and that their practices are always environmentally sound. There are a number of reasons why an image of indigenous peoples as intrinsically conservation-minded has been so eagerly, and at times unquestioningly, embraced (Milton, 1996)[18]. In part, this was a reaction against the opposite assumption, that indigenous peoples are inherently

[18] The question as to whether indigenous peoples are inherently conservationist has been the subject of much debate. As this issue can not be addressed in full here, I refer to some of the main writings on this topic. Most notable amongst those who have argued for greater recognition of the conservationist nature of many indigenous practices are Balée (1994) and Posey (1998). Critiques of 'the myth of primitive ecological wisdom' (Milton 1996: 139) include Alvard (1993), Diamond (1986), Ellen (1986), Redford (1981), and Wilshusen et al. (2002). Balée (1998: 14-19) summarises the main arguments on either side of this debate.

destructive of their environment (Diamond, 1986). Another important factor has been the desire to integrate indigenous rights with the conservation agenda. Consequently, researchers, conservationists and indigenous rights workers have been keen to look for common ground. While this can be constructive, it has been over-enthusiastically pursued in some cases. For example, Atran (2001: 170) describes how an NGO that was working with the Q'eqchi' people of Guatemala to help them gain a concession in the Maya Biosphere 'tried to encourage the Q'eqchi' to stress... concern for protection of nature... in order to better meet government criteria'. Similarly, in a conservation project in Kalimantan run by WWF, attempts were made to integrate a system of community forests, *tana ulen*, into the management of a national park. In her analysis of this project, Eghenter (2000: 333) reports that this was done on the assumption that *tana ulen* does actually conserve resources. She suggests that the staff of WWF, because of their enthusiasm for a perceived connection between local practices and conservation, overlooked whether there was actually any evidence for such a connection. In such a way, she suggests that NGOs have had a role in contributing to the legitimation of 'unproven assumptions' that traditional management of resources is inherently sustainable.

Such assumptions sometimes arise from confusing ideology with practice. If societies have a benign or beneficial impact on their environment, we cannot conclude from this that they have an ethic of conservation. The reverse is also true, that an ethic of conservation does not necessarily result in sound environmental practices. This is apparent both from Western, industrialised societies, as well as from indigenous, small-scale societies. For example, Aumeeruddy & Bakels (1994) report that in spite of the fact that sacred forests are well supported by local cultural belief systems in Kerinci, Sumatra, these are being destroyed. Similarly, hunting taboos are often cited as acting to conserve various species, but this is not necessarily the case. Wadley et al. (1997) cast doubt on the effectiveness of hunting taboos for conservation when people readily reject these if they conflict with current needs. In some cases, taboos may not be as rigid as is perhaps presumed, because people have ways of negotiating them. For example, among the Nuaulu there is a 'remarkable degree' of variation in the observation of taboos, as well as the potential to manipulate restrictions (Ellen, 1998: 249).

Another set of assumptions made by conservation professionals relates to an idealised image of 'the community'. As I discussed in chapter two, the myth of the community implies that its members hold a shared set of beliefs and values (Agrawal & Gibson, 1999). Consequently, community-based projects have sometimes been based on the mistaken assumption that there is a common goal or set of priorities held by a community (Eghenter, 2000; Li, 2002; Tsing, 1999). This is often not the case, rather, the opinions of those dominant in the community prevail and dissenting voices are not heard. Furthermore, even if local people do support conservation, and are united in this, it is often forgotten that this does not necessarily mean that they have the same priorities as a conservation organisation (Nations, 2001).

Although I have spent the last few paragraphs questioning the basis of many assumptions regarding the conservation ethic of indigenous people, I do not wish to deny that many societies do have such an ethic, nor that many societies effectively manage their environment. Nor do I wish to deny that trying to find common ground between the goals of indigenous people and conservation projects is laudable. There is great potential for benefits on both sides. However, these are unlikely to be achieved if people too readily jump to conclusions. What is needed is a sound understanding of local practices and ideology, something that can only be achieved through careful research. It seems that the debate as to whether indigenous peoples are inherently conservationist has resulted in the consensus swinging too far to the other extreme. In many quarters, rather than the assumption that such societies tend to degrade their environment, it is now assumed that they are sound environmental managers. In reality, societies vary, and all perhaps include elements of both stereotypes, of people as conservationists and as self-interested consumers (Padoch, 1982). This certainly seems to be true of the Lundayeh of Long Mio and Long Pasia. This is apparent from their varying support for conservation, and also from the contrasting decisions made by the villagers regarding the management of their environment, as I describe later in this chapter.

6: 3: 1. Lundayeh attitudes towards conservation

Having highlighted the fact that we cannot assume that indigenous peoples are conservationist, I will now consider whether there is evidence to suggest that such an

assumption holds true for the Lundayeh, focusing on the question of whether the Lundayeh can be said to have an ethic of conservation. Two 'versions' of an ethic of conservation are often distinguished in the Western literature, one which has been termed 'romantic', and the second 'utilitarian'. Thus, Moran (1996: 535) suggests that most people, 'if they are conservationists, they practice an utilitarian version of it, rather than a romantic or 'liberal' version'. However, if we examine the actual practices and values of traditional peoples, the two prove difficult to disentangle.

Plate 6.1: Logging activities close to Long Pasia

Indeed, among the Lundayeh elements of both 'versions' can be found. For example, I was present on several occasions when villagers saw recent logging activities close to their village (plate 6.1). On all these occasions people expressed great sadness at what they saw, one man saying that he felt sorrow or pity for the forest (*mei' fulung ui*). It was also apparent that some people feel a particular attachment to certain places, and because of this, wish for the forest to be maintained at these places. Such a response was evoked by old burial sites and also old village sites, particularly for those people that had either been born or lived there. These sentiments hint at the existence of a more 'romantic' ethic of conservation among the Lundayeh of Long Pasia and Long Mio. Further evidence comes from the ways in which people interact with their environment, and associated beliefs and rules. For example, the sanctions

against mocking animals would seem to be indicative of a view that animals should be respected. The Lundayeh also regard the forest with some fear because of the presence of spirits here. However, this fear does not seem to engender a particular feeling of awe or respect for the forest itself. Thus, these beliefs do not influence people's decisions regarding how to manage or utilise forest resources. Nor do they significantly alter how people interact with the forest, with the exception of a few people who avoid venturing into the forest alone or at night. The only time when I saw evidence of a more respectful attitude was when an elderly man chastised a group of young people for being too loud and raucous in the forest, warning them that they would cause a thunderstorm.

As is apparent from the sparsity of these examples, although it seems that the Lundayeh do have some respect for their environment, such feelings are not strongly held. This is further suggested by the fact that many people no longer follow or believe these few rules and practices. In the past, prior to people's conversion to Christianity, it is possible that such an ethic would have been much more significant. If the Lundayeh saw themselves as being in a reciprocal relationship with nature, as suggested in chapter five, they would likely treat it with respect for fear that if they did not do so, the spirit world would wreak its revenge – through natural disasters, bad harvests and so forth. There is evidence for this in the ethnographic descriptions of contemporary animist peoples (Aumeeruddy & Bakels, 1994; Dove & Kammen, 1997; Howell, 1989; Jensen, 1974). In contrast, today, no such feeling is invoked by local interpretations of Christianity, and concerns about the environment and conservation are seen as separate from theological matters. The arrival of Christianity seems to have brought a 'despiritualization of both natural and social worlds' (Appell, 1997: 92), and thus, to have changed the relationship between these two worlds.

While there is only limited evidence for the present existence of a conservation ethic rooted in a traditional eco-cosmology, in contrast, a utilitarian version of conservation is strongly held. People speak of the importance of the forest for hunting and in maintaining healthy rivers for water supplies and fish stocks. Thus, they recognise its role in enabling them to continue their particular way of life. In spite of this, there are very few management practices that are concerned with

conservation of the forest or its resources. One of the few explicit rules is that fruit trees should not be cut down to harvest the fruits. More generally, most people consider the use of electricity or poison for fishing to be irresponsible because such practices rapidly deplete fish stocks.

In contrast to other highland Borneo peoples (Eghenter, 2000; Sorensen, 1997), there is no system of protecting areas of forest by and for the community, or rather, there was not before the arrival of WWF. There are two areas of forest near Long Pasia that have been given some protection, but in both these cases, this was at the initiative of particular individuals. For example, there is a patch of heath forest close to Long Pasia that is owned by one of the villagers, i.e. he owns the title to this land. There had always been a tradition of open access to the resources found here, which is a valued source of edible and medicinal resources in particular. However, a few years ago, the owner banned the collection of firewood, recognising that otherwise the forest would soon disappear. In the year 2000, this area was made into an 'orchid garden' at the instigation of WWF. The area was fenced off, to prevent buffaloes entering and to demarcate the area, and orchids are being planted here, these salvaged from areas of forest due to be logged. This garden is now managed by the village youth for the conservation of orchids (a goal of WWF) and as a tourist attraction.

Another individual from Long Pasia took it upon himself to 'protect' an area of forest, although this was mainly out of a wish to establish proprietary rights. In the early 1980s, this man came across a patch of heath forest that was particularly rich in orchids and rhododendrons (apparently after he had dreamed about it). He set up a notice by the trail leading there stating that this was 'Noh's garden', and that he looked after it. Over the years, he has taken a number of tourists and visiting botanists to this site, and it was generally accepted within the village that he had proprietary rights over the place. However, a recent system for sharing out guiding work has undermined this. Furthermore, since this forest is within the logging concession, its future is now uncertain.

I have stated that the Lundayeh hold a strong utilitarian ethic of conservation. While this is true, people do not want conservation of the forest at the expense of

development and economic opportunities. In conversations about such issues, people told me that while they did not want to see all the surrounding forest logged, they also had to think about how they were going to earn money. People highlighted the fact that logging had brought the road to the village, which meant that they could now easily get to town. The view was also expressed that the work of WWF was all very well, but that it did not bring in money. This is in contrast to logging, say, from which a high wage can be earned. Thus, economics means that many people are in support of logging. People's perception is that they have to choose between conservation and logging, for example, in conversations about these issues, people said that although they support the work of WWF and would like to maintain the forest, they fear that if the logging were stopped then their opportunities to earn money would disappear.

In an ideal world, most people would like to conserve much of the forest, and at the same time continue to expand their agricultural activities. Given the increasing pressure on land, this is impossible, and there are some people who argue that the best way forward is to convert the surrounding forest to agricultural land – for cash-cropping of coffee, tobacco and vegetables. Thus, people are placing higher priority on land for agriculture than on the forest itself. While land for agriculture has always been a priority, the major difference now is that a choice has to be made between the two, because of the expansion of permanent fields, and also, the increasing shortage of land. Furthermore, agricultural activities are being more highly valued because of changing priorities. Thus, not only do people have a greater need for a cash income, but their dependence on the forest is declining.

In chapter five, I described how the Lundayeh are interacting less with the forest than they did, say, 50 years ago. This is leading to a decline in knowledge about the forest, its cultural links and subsistence values: in other words, an 'extinction of experience' (Nabhan & St. Antoine, 1993: 239). Consequently, not only are people becoming less dependent on the forest and its resources, but they no longer feel any particular attachment to, or responsibility towards, the environment. Although this is difficult to quantify, there is anecdotal evidence for such a process. For example, many of the elderly generation told me that the young have less respect for the environment. One case that was cited as an example was the over-harvesting of

cinnamon in the vicinity of Long Pasia by the young men of the village. This took place some 10 years ago, and today, mature cinnamon trees are rare in the forest around Long Pasia. The action of these men was put down both to their desire for quick money and to a lack of thought for the future.

Although such attitudes do seem to be more prevalent among the younger generation, there is by no means a simple correlation with age. Thus, there are certain young people who feel strongly about the environment, and its conservation. Conversely, there are a number of quite elderly people who showed no evidence of any feeling of attachment towards their environment, generally taking a very pro-'development' stance (for example, supporting the conversion of forest to plantations and agricultural fields). The reasons for these variations are complex. People make different evaluations depending on their own priorities, their experience and knowledge of other ways of life, and their aspirations. Way of life is an important factor in shaping people's values and decisions. Typically, those who had lived much of their lives in the village, following the 'traditional' way of life, were those who had stronger links with the forest and landscape, and were more concerned with its conservation. 'Extinction of experience' does then seem to be a significant factor, resulting in an overall trend towards the forest being less valued – both materially and culturally. The consequences of this are that people are more willing to consider or accept forest loss. Thus, increasingly people are deciding against conservation in favour of other options. This is partly because of a decline in the way that people value the forest, but this is not the entire story. These decisions also reflect people's changing needs and opportunities.

6: 3: 2. Lundayeh views of outside conservation projects

From my discussions with local people about conservation, it became apparent that there were often discrepancies between what people said and what they did. This was because people often responded in a way that they thought I would like to hear. For example, assuming that I would be pro-conservation, they also expressed their own support for this. I point this out because, more significantly, local people do the same in their dealings with government bodies and conservation organisations. Thus, they say what they think people would like to hear, or ask for what they think they will

get. This tendency has been noted by other researchers, and consequently, it has been suggested that local people's interests and concerns are often undervalued because of this, resulting in outside organisations projecting their own needs onto local people (Laird, 1999). To return to the example cited above of the conservation project in Kalimantan, Eghenter (2000) describes how the views of WWF shaped local people's interpretations of their own management practices. This took place as local people began to interpret their own practices using the terminology of WWF, while at the same time WWF staff made assumptions about these.

However, this is not to say that local people are completely cowed by outside organisations. Indeed, in the example being considered here, local people apparently adopted environmentalist rhetoric because they regarded WWF as 'a potential ally in advancing their quest for rights over forest resources' (Eghenter, 2000: 348). Thus, WWF's agenda was not simply being imposed on local people, but they were willing to adopt it because they wished to use WWF's status and political influence to defend and promote local values and management practices. Similar findings have been made elsewhere. For example, the Nuaulu of Seram 'in order to protect their own lives' are apparently 'adopting the discourse of officialdom and national politics' (Ellen, 1999a: 145). The same also seems to be taking place in the Ulu Padas, where people are using the political potential of conservation arguments for their own ends, as I describe towards the end of this chapter. In the light of these issues, caution was needed when interpreting what people said regarding their views of conservation.

Earlier in this chapter, I made the point that although local people may be conservationist, this does not necessarily mean that their priorities are the same as those of conservation organisations. Lundayeh attitudes towards conservation differ in a number of important respects from those of outside bodies, WWF and the State Government being those of most significance here. As I have described, although conservation of the environment is a priority for the Lundayeh, this is mainly for short-term utilitarian reasons. Thus, local people are interested in conservation of the river system to ensure clean water supplies, and a continued source of fish. They also prioritise conservation of the forest as a habitat for game, because of their desire to continue hunting. The conservation of biodiversity is not a priority. Nor are people

interested in the conservation of wildlife *per se*, except for those species important as game. This is in contrast to the attitudes of both WWF and the Government's Wildlife Department. Clearly there are overlaps in interest – conservation of the forest as a functioning ecosystem would ensure continued survival of biodiversity, including animals, so addressing those issues of concern to WWF, the Wildlife Department and local hunters. Similarly, watershed protection is of common interest to both the Lundayeh and those who live downstream, as well as being a goal of WWF and the State Government. However, for some of these issues, solutions exist that could bring these parties into conflict. For example, high populations of boar and deer can be maintained in agricultural areas and plantations, and so maintenance of old growth forest is not necessarily a priority for the Lundayeh. In contrast, for both WWF and the Wildlife Department, conservation of a diversity of animal species is a priority, a goal that could in part be achieved through the restriction, or banning, of hunting.

Local people are aware that their own goals differ from those of WWF and the government, and this is the cause of some concern, and an element of distrust. Distrust and conflict between local people and conservation projects has been widely reported from around the world. Often this is because people feel that such projects do not recognise local priorities. To cite just one example, Michon et al. (2000: 194) found in their work in Kalimantan that villagers had a 'fundamental grievance' against conservation, since 'it values the forest more than humans.' Similarly, in the Ulu Padas, local people are concerned that WWF is primarily interested in protecting animals and orchids, in other words, that they prioritise protection of biodiversity over the welfare of local people. This became apparent when people voiced fears that WWF was only interested in creating a protected area. Therefore, although many people support WWF in trying to minimise the extent of logging, they fear that this could occur at the expense of their rights to resources, for example, through the establishment of protected areas to which they are denied access. In their eyes, such a scenario would simply result in the land passing from the logging company's control, to that of WWF, and so local people would gain little, if anything at all, from such an outcome.

A more recent view to emerge within the communities is that conservation and the work of WWF in particular, is something of a hopeless cause, albeit a worthy one. In the light of their own past experiences and WWF's limited success in trying to restrict logging activities, a feeling of helplessness and powerlessness is beginning to prevail. This in turn is leading to an attitude that people may as well take what they can while they can. When the forest is going to be logged, there is no incentive to be concerned with its long-term management. Why take care not to over-fish if the rivers are being polluted by logging? Why worry about over-hunting when outsiders can easily come into the area to hunt?

6: 4. Making compromises: conservation versus logging

In this section I describe recent examples of resource management decisions made by the Lundayeh of the Ulu Padas. These illustrate the various factors that are taken into consideration by people when making such decisions, and so, can help us to understand how the Lundayeh are striving to reach a compromise between the competing demands with which they are faced at the turn of the twentieth century. Particularly difficult to reconcile is people's desire to maintain an existing way of life and their desire for change in the form of 'development'. This conflict – one that is common for people in all parts of the world – is faced by every household in Long Pasia and Long Mio. The dilemmas with which people are faced are apparent from the fact that, often, the same people who ask 'what are the Lundayeh if there is no forest?', themselves work for the logging companies. People have attempted to resolve this conflict in different ways, depending on their particular priorities, experience and knowledge. This, in turn, has meant that there is disagreement and also conflict within the communities. People's response to logging is one theme explored in this section. However, before turning to this, I will consider the decisions that some people have been making in other aspects of their interaction with the environment, namely their use of forest resources and agricultural strategies. I do so through examining some individual cases that for me were particularly striking and that are indicative of wider trends.

On one occasion in Long Pasia, I encountered a man making a number of spear shafts. When I asked him why he was making these, he told me that he thought in a

few years time it would be very difficult to find the best wood for these, and so he was making them while the wood was still available. This example illustrates an increasingly common view among local people, that they should get what they can while they can. Such an attitude encourages unsustainable practices. For example, a few people in the villages use electricity to catch fish, a practice that rapidly depletes fish populations. When I asked people whether they were concerned about the long-term consequences of their actions, one response was 'why should we be?'. There is an expectation that the fish are going to disappear regardless of their own actions, and people have noticed that fish are now much less abundant than just five years ago for example. This is presumed to be due to river pollution, and because of the increasing number of people in the region, especially from those working in the logging camps.

Increasingly then, patterns of forest resource use reflect a short-term attitude towards the environment. As I suggested in the previous section, an 'extinction of experience', particularly among the younger generation, has contributed to this shift in attitudes. However, of much greater significance have been the environmental and social changes to which the Lundayeh have been subject. Extensive logging in the region has brought the realisation that in a few years time, forest resources will be very limited. Lack of control over resources is also a contributory factor, as has been noted by researchers elsewhere in Borneo (e.g. Michon et al., 2000; Vayda, 1981). For example, the fact that the Lundayeh have no control over local fish resources means that they have no incentive to conserve these.

The people of Long Pasia and Long Mio have come to realise their lack of rights over local resources in the eyes of the government, and among the general populace. Thus, according to the law (Sabah Forest Enactment of 1968) 'forest produce' cannot be extracted for commercial purposes from State Land, unless a licence has been issued, although 'native peoples' are allowed to extract produce for subsistence purposes. However, native peoples have no particular rights to the resources in their locality. Consequently these resources are common property to all natives of Sabah, and this is generally how they are perceived. For example, on one occasion Long Pasia villagers complained to the local police department that people from the lowlands had been coming in and extracting large amounts of the medicinal plant

angang (*Myrmecodia* sp.), widely used in Chinese medicine. The response of the police was 'What is the problem? We are all Malaysians.' Much of the Ulu Padas region is now accessible by road, opening up the area to hunters, fishermen and plant collectors. The extent to which outsiders come into the area is unclear, as most people do not pass through the villages. Certainly many people go hunting and fishing from the logging camps, and people also come up from the towns on a regular basis. A future problem could be collection of orchids. Elsewhere in Sabah there is a burgeoning trade in orchids, and local people are aware that some orchids can be sold for high prices. Furthermore, much publicity has been given to the diversity of orchids to be found in the region, a fact highlighted as part of WWF's campaign to conserve part of the forest here. Ironically, one outcome of this campaign could be to encourage illegal collecting.

I turn now to resource management decisions relating to agriculture. As I described in chapter two, a recent trend is that people are spending more time and resources growing cash crops at the expense of rice cultivation. One elderly man from Long Mio told me that he wished to concentrate entirely on cash crops and to cease swidden cultivation because he reckoned that this made better economic sense. (I was unable to determine whether his reckoning was correct.) This man's ideas were influenced by both politics and economics. The influence of politics comes from government agricultural policy, this being directed at encouraging cash-crops, for example, through the provision of subsidies for tobacco and coffee. Economics also favours cash-crops, because of the availability of new market opportunities with the improved road system, and also, because of people's need and desire to earn money. In spite of these influential factors, this man finally decided to continue with some swidden cultivation. The reason for this was that he was over-ruled by his wife, who wanted to be able to eat hill rice and the associated vegetables. Furthermore, she wished to participate in village work parties, which are only conducted for rice cultivation. Thus, in this case tradition proved to be the deciding factor in determining this household's agricultural strategy.

More typically though, it is economics that prevails. Indeed, many people are choosing to participate more fully in the cash economy. However, this shift is also taking place out of necessity. For example, the decline in forest resources has meant

that people are having to turn to other options, such as buying processed goods. As I described in chapter three, tinned meat and chicken wings are replacing hunted meat because this is becoming harder to obtain. One other factor that is coming increasingly into play in determining people's agricultural decisions is pressure on land. Much of the land close to the village is privately owned, and more distant land is under application. The opportunities to establish perennial crops for those individuals who do not own land title or have applications pending are very limited.

This pressure on land, together with an ever-decreasing forest, have helped to create a sense of urgency among people to gain land title. This has been one reason for a shift in attitudes towards logging. A common practice is for logging companies to promise that they will help individuals gain land title if they sign over the rights for the timber on this land. In order to gain land title, people must first register their applications with the District Land Office, the body responsible for deciding between conflicting claims and approving these. There is a massive backlog of applications, and the process typically takes many years to complete. However, it can be speeded up by paying money to those involved in approving the application. This is where the timber companies come in. They put up the money for this, an investment which is repaid through the sale of timber once the land application has been approved. Thus, logging has become a route to gaining land title, as well as a very lucrative activity in its own right.

This is the reason why one man from Long Mio told me that he is happy for the logging companies to clear much of the forest immediately surrounding his village. This land is either owned or under application by the villagers (much of it by this individual), and the scenario that he envisages is that after logging the villagers will use the land for cash crops, such as coffee. As he pointed out, converting forest into fields is a lot of work, and so it would be to their advantage if the logging company cleared the land for them (in addition of course to receiving payments for the logging rights). This man is more extreme in his views than most, but he is by no means unique. He is not at all concerned with maintaining the Lundayeh way of life, in which the cultivation of hill rice and hunting are central. In fact, this is the same man I mentioned above who wanted to grow cash crops rather than rice on the basis that this made better economic sense. In the light of his views it was with great surprise

that I learnt that he had previously been imprisoned for protesting against logging. There had been some other issues at stake in this earlier situation, namely, disputes over rights to the land in question, and thus, disagreement over whom the logging company should have negotiated with. However, that he undertook this drastic action is remarkable, and probably not something that he would do today. This man's views regarding logging have changed for two reasons. Firstly he realises some of the benefits that are to be had from logging activities (namely, the road, wage labour opportunities and land title), and is unwilling to give these up. In addition, he feels powerless to halt or to reduce the logging. The only outcome of his previous action against logging was that he had to spend a few days in prison. This one individual is indicative of the sea–change that has occurred in people's attitudes.

Current attitudes are best illustrated by considering the events that occurred when a company was logging illegally, upriver from Long Pasia. This was a highly contentious issue, causing disputes both within the village, and between Long Pasia and Long Mio. In summary, a logging company began working in a new area of State Land. This had been designated for logging, with the exception of one area that was protected because it was the water catchment area supplying the gravity feed pipe to Long Pasia. This area of State Land was surrounded by privately owned land. Local people (from Long Mio, or possibly from both villages, depending on whom you believe) sold the rights to log here to the company, an action that then allowed the company access to the State Land. Once here, the company encroached into the water catchment area.

The points that I wish to highlight in this story are the decisions of local people, both in allowing the logging company to start activities in this area, and in the way that they responded after their illegal activities became known. A feeling among many is that, although they wish that there was less logging, or none at all, in the region, they have no power to stop it. Furthermore, people fear that if they do not make deals with the companies, then they will either lose out on these offers, or the companies will fulfil their threats to withdraw completely from the area, so ceasing maintenance of the road. This atmosphere of uncertainty and intimidation means that some people decide to make deals with the logging companies. In this instance, such decisions

enabled further expansion of logging activities in the area, because of the easy access to a new area of State Land.

Subsequently, when the company's illegal activities became known in Long Pasia, people's responses were mixed. The decision made by the village committee was that they should not report the company to the authorities, but rather, should ask for compensation. The reasoning behind this was that if they did report the company, then the village would gain nothing, as the usual response is for the Forestry Department to confiscate the timber and either impose a fine on the company, or in extreme cases, stop it from working altogether. This was the outcome of a previous incident in which illegal logging activities had been reported by the villagers. Therefore, on this occasion, the villagers decided to approach the company themselves to ask for compensation.

This series of events is indicative of the shift in attitudes towards logging, and also to the environment. The environment is increasingly being seen as something that can be negotiated over, and as a commodity. A second incident illustrates how this attitude has come to take precedence. Early in 2000, the company responsible for maintaining the logging roads in the Ulu Padas asked Long Pasia for permission to quarry rocks from the river just upstream from the village. The village committee decided to allow this, the company paying 6RM per lorry load. Many of the women were unhappy at the decision to allow quarrying, a decision they felt that they had not been consulted on (the village council is composed entirely of men). They were unhappy because of the environmental impact of these activities, the river becoming silted when rocks are being extracted. Although the village is becoming increasingly dependent on the piped water supply, this is unreliable, the pipe often becoming blocked, and this water also became silted after the logging activities described above. At such times, the river is used for drinking and cooking, and it continues to be where most people wash clothes and where many people bathe. A further cost is that this activity is likely to have an impact on fish populations. Many of the fish spawn in the shallow, stony areas of the riverbed. The people of Long Mio, where stone extraction began in 1999, report that some of the spawning sites were destroyed by these activities. Both villages decided to allow rock extraction because

of the money involved. In addition, because the river had already become polluted, many people felt that a bit more pollution would make little difference.

I do not mean to give the impression that people are now in support of logging, and that they have decided to give up trying to protect their environment. A campaign to at least reduce the extent of the logging, if not to stop it, is still being fought. Environmental arguments are an important part of this. These are genuine concerns, the villages having already experienced a decline in water quality in the rivers among other negative impacts, such as a reduction in animal numbers and the social impact of nearby logging camps. Both Long Mio and Long Pasia have written to the State Government and the local newspapers to protest at some of the logging activities in the region largely on environmental grounds (see figure 5.7). However, people are becoming much more pragmatic, if not cynical. People believe that they will not be able to stop the logging, and so have concluded that they should just make the best of a bad situation. People's ultimate goal has shifted from trying to protect their environment to seeking compensation. Thus, people take an environmental stance, and also use arguments based on their traditional rights in order to get as much out of the logging companies as possible (for example, in compensation payments), or to try and gain some political sway to further their own individual land claims. Unfortunately, this then becomes self-fulfilling, as the logging companies realise that they can buy people off.

This brings me back to an issue highlighted in the previous section, and that is the political dimension of conservation. As Peluso (1992: 6) has noted, everyone, including local people and states, constructs ideologies to justify their rights to forest resources. In the case of the Lundayeh, this process is taking place as people adopt both conservationist and pro-development arguments in their attempts to reduce logging in the region, and negotiate for land. Thus, they seem to be using a strategy also observed among the Meratus of South Kalimantan (Tsing, 1999). Community leaders here, through playing both to a '"green" fantasy formulated as tribal wisdom, and to a state rhetoric that promises roads and other facilities' (Li, 1999: xxii), have maintained the support of both the conservation and government sectors. The Lundayeh are attempting the same, and are involved in a complex web of relationships with WWF, logging companies and government departments.

Such a strategy reflects the pragmatic approach of local people. Fully aware of their own limited negotiating power, local people are simply striving to get the best that they can out of a difficult situation. The Lundayeh are living in a world in which they have limited choices. However, they are able to employ what Scott (1985) has termed the 'weapons of the weak' to resist some of the decisions imposed on them. Adopting the rhetoric of the state and of conservationists is one such weapon. Another example of such resistance is the occasion on which the men of Long Pasia withdrew their labour from one of the logging camps after logging activities had caused river pollution in the village. The men refused to return to work until compensation for the village had been agreed to. This action was possible because local people make up a substantial part of the workforce of this logging camp. However, while the fact that this strike took place demonstrates local people's negotiating power over the logging companies, the nature of their demands reflects the limited extent of this. Thus, they did not ask for the logging activities to stop or to be reduced, but simply for compensation.

I will end this section with one more example, although many of the decisions relating to this case have yet to be made. In 1999, Long Pasia applied for Native Reserve status for 4,500 hectares of land, and in the following year, Long Mio applied for 600 hectares of land as Native Reserve. This is a form of shared tenure, land title being held by the community as a whole. All activities within a Native Reserve must have the support of all members of the community. Thus, such a designation enables the community to manage an area of forest for the benefit of all. The Department of Lands and Surveys has apparently reported that Long Pasia's application has been given priority over all other competing claims, and is now in the final stages of processing (Long Mio's application is still at an early stage) (Vaz, pers.comm.). If approved, this Native Reserve would be one of the largest areas of communal forest to be established in Sabah in recent history (Vaz & Hoare, in prep.).

However, the main challenges still lie ahead for the village of Long Pasia (and for Long Mio, should their application be granted), since it will be up to the villagers to decide how best to manage this reserve. In view of the varying needs and wishes of different sectors of the community, this will undoubtedly prove difficult. Such a

designation does not exclude the possibility of the villagers deciding to sell the timber rights to the area. Alternatively, if they so decide, the Native Reserve offers an opportunity for the Lundayeh to maintain some of the region's forest, so that at least a part of the Ulu Padas can remain a Lundayeh landscape.

6: 5. Conclusions

One of the main goals of this thesis has been to critically examine the concepts of 'wild' and 'wilderness' with respect to the Ulu Padas environment. To achieve this, the ways in which the Lundayeh categorise and perceive their environment and resources were investigated. My findings suggest that the Ulu Padas should not be considered as a wilderness, nor its resources as wild. Indeed, this would seem to correspond with the Lundayeh perspective. The evidence to support this come from data on the ways in which the Lundayeh engage with their environment, and also from how food resources are used and shared.

From my analysis of food and diet, it is apparent that the Lundayeh are not simply agriculturalists, but are also heavily dependent on forest resources. Hunting, fishing and the use and management of plant resources make a valuable contribution to their resource base. Thus, hunted meat and fish provides most of the protein in the diet. Although most of the vegetables, and many fruits, are from the fields or cultivated in the village, a wide range of non-cultivated plant resources are also used. These are harvested from a range of vegetation types, including riverside vegetation, heath forests, fallow vegetation and old-growth forest. Thus, a feature of the Lundayeh subsistence system is diversity – of both the food resources and vegetation types utilised.

The Lundayeh themselves recognise their dependence on forest resources. People have a strong preference for many forest resources, and more generally, appreciate them because they add variety to the diet. Furthermore, use of forest resources forms an important part of Lundayeh identity, as I described in chapter three. Although the Lundayeh describe themselves as swidden agriculturalists (this being the way of life of their ancestors), they also say that they are people of the forest (*lun luk tudo bang fulung* – literally, 'people that live in the forest'). Many people still express pride in

being knowledgeable about the forest, and in being able to live off its resources (although the view that this is a backward way of life is beginning to predominate). Furthermore, hunting, particularly of boar, is an important part of Lundayeh identity. Clearly, describing the Lundayeh simply as agriculturalists is mistaken. As others have highlighted, it is overly simplistic to draw a stark division between non-agricultural and agricultural societies (Colfer et al., 1997; Ellen, 1999b). Rather, agriculture and use of forest resources may be closely integrated and complementary, as is the case for the Lundayeh.

The integral character of agriculture and forest use is a particular characteristic of swidden agriculture. This is because swiddening entails the creation and manipulation of patches of fallow vegetation. Thus, fields develop into fallows or sometimes agroforests, and these may eventually revert to forest (although this situation is now changing for the Lundayeh, as they are switching to more permanent fields). The character of this system means that it is difficult to define 'field' as opposed to 'forest', since they merge into one another. Furthermore, the practice of swidden cultivation has a profound influence on the forest that regenerates, because of its influence on forest structure and species distribution (described in chapter four). The influence of swidden cultivation on the forest is recognised by the Lundayeh. They also encourage some of these changes to ensure the continued availability of a diversity of resources, for example, through enrichment planting of fruit species in fallow vegetation. Thus, the swidden practices of the Lundayeh can be described as part of a system of forest management.

These features of the Lundayeh subsistence system have a number of implications for the theoretical issues being addressed. In particular, they highlight the problems with the category of 'wild'. Can we define as 'wild' a forest plant that has self-seeded in a field, or a cultivar that has persisted in fallow vegetation? What about resources that have been protected, for example, by selective felling, or those that have been distributed by people, for example, by discarding the seeds after eating the fruit?

Clearly, no simple dichotomy can be made between wild and cultivated resources. However, this is not to say that no distinction can be made, rather, that these

categories are blurred and over-lapping. Consequently, I would advocate wider use of the categories of 'managed' and 'semi-wild', these to refer to those resources that are influenced by people, either consciously or unintentionally. This would encourage wider recognition of the diverse ways in which people manipulate and interact with their environment, something that would in turn facilitate better understanding of the role of people in managing and shaping their environment. Indeed, because of the history of Lundayeh migrations over the last century, much of the Ulu Padas region has been profoundly influenced by people – both through their agricultural activities and their use of forest resources. Thus, it seems that much of the forest of the Ulu Padas is anthropogenic, and cannot be described as a wilderness. This adds to the growing body of evidence suggesting that this is true for much of Borneo's forests (Brookfield et al., 1996; Padoch & Peluso, 1996).

Investigation of Lundayeh perceptions of their environment suggests that they recognise the role of people in shaping the Ulu Padas and its resources. With respect to their food resources, the Lundayeh distinguish forest foods from those grown in the fields, indicated by their use of the term *kikid fulung* (forest side-dishes). Further evidence for the salience of this category comes from the different role of these foods in the diet. Thus, at *irau* (feasts) it is considered unacceptable to serve *kikid fulung*, i.e. hunted meat or non-cultivated plant resources. This category of forest foods is the nearest equivalent to that of 'wild foods', as widely used in the literature. However, it is not directly comparable. The evidence for this lies in the ways in which food resources are owned and shared. The degree of management of a resource is reflected in ownership rights: cultivated resources are owned, although they are usually shared; forest resources are freely available to all members of the community, but not to outsiders. That forest resources are communally owned suggests that they are not regarded as 'wild', i.e. in the sense of being uninfluenced by people. Rather, this indicates that the Lundayeh recognise their role in shaping the forest landscape, and thus, their influence on forest resources.

With respect to Lundayeh perceptions of their environment, the forest (*fulung*) is contrasted with both fields (*lati'* or *kebun*) and village (*bawang*). The former dichotomy is reflected in the classification of resources, outlined above. The category *fulung* is also used to describe all vegetation types outside of the village and fields.

Thus, when people set off from the village, for example, to go hunting, they say that they are 'going into the forest' (*ame bang fulung*). However, the category *fulung* cannot be equated with that of 'wilderness', since people's ecological impact on the forest is recognised. For example, within the category of *fulung*, various types of secondary forest are recognised by the Lundayeh: *amog darii* (small secondary forest), *amog karar* (large secondary forest) and *amog balui* (literally, changing secondary forest). These categories reflect the history of forest clearance.

The influence of the Lundayeh on the forest has not only been ecological. They have also created a cultural landscape. The Ulu Padas is associated with various stories and legends, telling of previous inhabitants, historical events, spirits and mythical beings. Consequently, the Ulu Padas is regarded as a Lundayeh landscape.

However, Lundayeh perceptions of their environment are changing. This is partly because they are shifting away from a forest-based lifestyle. As Ingold (1993) has highlighted, the way in which people engage with their environment shapes how they perceive it. Consequently, these changes to the Lundayeh way of life have meant that the Ulu Padas is losing its particular significance for the Lundayeh, and it is coming to be viewed as a 'wilderness'. Logging activities and loss of the forest are also having an impact on perceptions, people realising that the forest is a limited resource, and also, viewing it more as a commodity.

The significance of these changes in perception becomes apparent when considering their influence on people's choices regarding the management and use of their environment. Thus, the fact that the landscape is losing its particular significance for the Lundayeh has meant that they are more ready to accept forest loss and environmental change. Furthermore, the forest has become something that can be bargained with. These changes are having repercussions on conservation projects in the area, since economic arguments increasingly win out over those for conservation, and more people are willing to make deals with the logging companies.

The fact that the Lundayeh are following a way of life that is increasingly separated from the forest also has more subtle, although equally profound consequences. Recognising that people and their environment are closely integrated implies that

each influences and shapes the other. Consequently, a change in this relationship will not only impact on environmental perceptions, but will also influence how the Lundayeh perceive themselves. As they themselves have asked, 'what are the Lundayeh if there is no forest?'. At the moment, the Lundayeh of the Ulu Padas still regard themselves primarily as hill rice farmers and hunters. How much longer this will be the case is uncertain. These aspects of Lundayeh identity will certainly decline in importance, as people switch to a way of life, common elsewhere in rural Sabah, of cash-crop production and logging.

However, predicting what the future holds for peoples is notoriously unreliable (Persoon & van Est, 2000). The future of the Ulu Padas and of the Lundayeh people depends on the decisions of those in government, for example, whether Native Reserves are designated for the villages, and whether environmental legislation for logging activities is implemented. Equally significant are the decisions made by the Lundayeh themselves, and the choices that they make regarding the management of their remaining land and resources. These decisions will determine whether the Ulu Padas region becomes covered by plantations and intensively cultivated fields, or whether it can be maintained as a uniquely Lundayeh landscape, with rich cultural associations and ecological diversity.

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Appendix 1: Hunting success rates

LONG PASIA					
Head of household:	Observation period:	Total no. days:	Length of each trip (days):	No. people:	Hunting returns:
Baru Agong	Mon. 27th Sept. – Sun. 3rd Oct.	1.5 out of 7	1	1	-
			0.5	1	-
	Sat. 9th Oct. – Wed. 13th Oct.	2 of 5	1	1	-
			1	4	Boar
	Fri. 29th Oct. – Thurs. 4th Nov.	2 of 7	1	2	Barking deer
			1	3	Barking deer
Balang Singa	Fri. 5th Nov. – Thurs. 11th Nov.	3.5 of 7	1	2	Mousedeer
			0.5	2	Boar
			2	4	Boar
	Mon. 22nd Nov. – Sun. 28th Nov.	3 of 7	3	4	Boar
Mudin Sia	Wed. 26th Jan. – Tues. 1st Feb.	1.5 of 7	0.5	2	-
			1	4	Sambar deer
	Wed. 2nd Feb. – Sun. 6th Feb.	3 of 5	1	6	-
			1	2	-
			1	3	-
	Mon. 14th Feb. – Sun. 21st Feb.	1.5 of 7	1	4	-
			0.5	1	-
	Fri. 17th Mar. – Tue. 21st Mar.	1 of 5	1	2	2 Barking deer
Panus	Mon. 15th May – Sun. 21st May	3 of 7	1	2	-
			2	2	Barking deer
	Wed. 31st May – Tues. 6th June	1 of 7	1	1	Banded linsang
	Wed. 21st June – Tues. 27th June	3 of 7	1	1	-
			2	2	-
	Sat. 1st July – Fri. 4th July	4 of 7	1	2	Boar
			3	3	Boar
Selutan	Mon. 18th Sept. – Fri. 22nd Sept.	2 of 5	0.5	3	Slow loris
			0.5	6	Small-toothed palm civet
			1	3	Hose's langur
	Tues. 26th Sept. – Mon. 3rd Oct.	4 of 7	1	1	-
			1	4	-
			2	2	Sambar deer

SUMMARY OF DATA:
17 of 31 trips were successful = 55% success rate.
Average no. trips per week = 2.2 (counting 7 day periods only)
Average no. days spent hunting per week = 2.6 (counting 7 day periods only)
Average length of hunting trip = 1.2 days
Total days of observation: 97

LONG MIO					
Head of household:	Observation period:	Total no. days:	Length of each trip (days):	No. people:	Hunting returns:
Padan Sudai	Mon. 4th Oct. – 8th Oct.	0.5 of 5	½	2	-
Rot Sia	Mon. 7th Feb. – Sun. 13th Feb.	1 of 7	½	1	-
			½	1	-
Pengiran Darong	Sat. 25th Mar. – Fri. 31st Mar.	2 of 7	½	2	-
			½	5	Sambar deer
			1	2	Sambar deer
Gabo Lawa	Mon. 22nd – Sun. 28th May	3 of 7	1	1	-
			1	2	-
			1	2	-
Lawa	Sat. 29th July – Fri. 4th Aug.	0 of 7	-	-	-
Rot Sia	Mon. 16th – Sun. 22nd Oct.	0.5 of 7	½	1	-

SUMMARY OF DATA:
2 trips out of 9 successful = 22% success rate.
Average no. trips per week = 1.8 (counting 7 day periods only)
Average no. days spent hunting per week = 1.3 (counting 7 day periods only)
Average length of hunting trip = 0.7 days
Total days of observation: 40

Appendix 2: Dietary survey form

Borang Tentang Luk Kenen Muyuh Bang Satu Minggu

Ngeden uluh tetek rumah: Delei: .....
Decur: .....

Kinula lun luk tudo bang rumah muyuh nekini:
Lun rayeh: .....
Anak (tunge Lg. Pasia / Lg. Mio): .....
Anak (dei sekolah dei Sipitang): .....

	Anun luk kenen luk ilap muyuh eco sini? (Ngayud ngeden fung, lawid, irin, bua, kikid ret kebun atau kedai.)	Anun kiula' ilap muyuh? (Ngayud tuda' lebin, batang, burur, kilo, bigan, tin, biji.)	Ilap muyuh ret yafeh? (Fulung karar, amog karar, amog darii, tangab abpa, kebun, birey lun, meli ret lun, kantin atau Sipitang)	Idey nengalap luk denen neh? (Ngayud ngeden lemulun.)	Safeh luk uan masui, tuda' ula', dan tuda' raga neh?	Anun kikid muyuh eco sini dan tuda' ula'?
Finginud	Fau Lawid buda' Baka Sedai Bua kapab	4 lebin 5 1 2 lebin 20	Tangab abpa Apba Fulung Kebun Fulung	Ganit Gituen Gituen Ganit Ganit	3 lebin x 1RM - 10 kilo x 6RM - -	1 lebin fau 5 lawid Setengah kilo baka 1 lebin sedai 20 bua kafab
Eco 1						
Eco 2						
Eco 3						

	Anun kikid luk ilap muuh eco sini?	Anun kiula' ilap muyuh?	Ilap muyuh ret yafen?	Idey nengalap kikid neh?	Safeh luk uan masui, tuda' ula', dan tuda' raga neh?	Safeh luk uan kikid muyuh eco sini dan tuda' ula'?
Eco 4						
Eco 5						
Eco 6						
Eco 7						

Weekly Dietary Survey Form

Names of heads of household: Man: .....
Woman: .....

Number of people in household:
Adults: .....
Children (living in Lg. Pasia / Lg. Mio): .....
Children (at school in Sipitang): .....

	What foods were collected today? (Write the kind of animal, fish, vegetable, fruit, shop-food.)	How much was collected? (Write how many bundles, stems, items, kilos, bowls, tins.)	Where were these collected from? (Old-growth forest, secondary forest, riverside, field, another villager, village shop, Sipitang.)	Who collected this food? (Write the person's name.)	Which foods were sold, how many, and for what price?	What foods did you cook today and how much?
Example	Fern shoots Fish (*lawid buda'*) Boar Mustard greens Fruit (*bua kapab*)	4 bundles 5 1 2 bundles 20	Riverside River Forest Field Forest	Ganit Gituen Gituen Ganit Ganit	3 bundles x 1RM - 10 kilos x 6RM - -	1 bundle of fern tips 5 fish ½ kilo boar meat 1 bundle mustard greens 20 fruits
Monday						
Tuesday						
Wednesday						

Dietary survey form – translation of page 1

Appendix 3: Foods eaten as *kikid*

A. VEGETABLES		
LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Dorey	Acanthaceae	*Justicia obtusa* (Nees) Lindan
Keduang	Acanthaceae	*Pseuderanthemum acuminatissimum* (Miq.) Radlk.
Kuru (sia & bata)	Amaranthaceae	*Amaranthus* spp.
Ufa'	Araceae	*Alocasia* sp.
Ufa'	Araceae	*Colocasia esculenta* (L.) Schott.
Bunger	Araceae	*Lasia spinosa* (L.) Thwaites
Sikarok / kelalang batu	Araceae	*Schismatoglottis* cf. *calyptrata* Zoll. & Mor.
Butu / kelalang	Araceae	*Schismatoglottis* sp.
Dinudur	Basellaceae	*Basella alba* L.
Pau sia	Blechnaceae	*Stenochlaena palustris* (Burm.f.) Bedd.
Sayur busak	Brassicaceae	*Brassica chinensis* Willd.
Sayur peit / sawi	Brassicaceae	*Brassica juncea* (L.) Czern.
Sedai / abi'	Brassicaceae	*Brassica juncea* (L.) Czern.
Sesei	Brassicaceae	*Brassica juncea* (L.) Czern.
Kailan	Brassicaceae	*Brassica oleracea* L.
Kobis	Brassicaceae	*Brassica oleracea* L.
Sayur picai	Brassicaceae	*Brassica rapa* L.
Sayur putih	Brassicaceae	*Brassica rapa* L.
Sayur gerinting	Brassicaceae	*Brassica* sp.
Kaber	Bromeliaceae	*Ananas comosus* (L.) Merr.
Sesila'	Caricaceae	*Carica papaya* L.
Riep alud	Cecropiaceae	*Poikilospermum* sp.
Riep	Cecropiaceae	*Poikilospermum suaveolens* (Bl.) Merr.
Siluk	Commelinaceae	*Commelina paludosa* Bl.
Udu daya / Udu necing	Compositae	*Crassocephalum crepidioides* (Benth.) Moore
Kangkong	Convolvulaceae	*Ipomoea aquatica* Forsk.
Ubi waar	Convolvulaceae	*Ipomoea batatas* (L.) Lamk.
Tadjak fadey	Cucurbitaceae	*Benincasa hispida* (Thunb. ex Murray) Cogn.
Timon	Cucurbitaceae	*Cucumis sativus* L.
Timon abai	Cucurbitaceae	*Cucumis* sp.
Timon belanda	Cucurbitaceae	*Cucumis* sp.
Tabo	Cucurbitaceae	*Cucurbita* sp.
Tadjak	Cucurbitaceae	*Cucurbita* sp.
Sifula / petolak	Cucurbitaceae	*Luffa acutangula* (L.) Roxb.
Peria	Cucurbitaceae	*Momordica charantia* L.
Tadjak cina	Cucurbitaceae	Unknown species
Tukul langit	Dracaeneaceae	*Dracaena* sp.
Ubi kayu	Euphorbiaceae	*Manihot esculenta* Crantz
Cangkok manis	Euphorbiaceae	*Sauropus androgynus* (L.) Merr.
Patar	Fabaceae	*Parkia* sp.
Peritak boncis	Fabaceae	*Phaseolus vulgaris* L.
Peritak lebping	Fabaceae	*Psophocarpus tetragonolobus* (L.) DC.
Peritak kadang	Fabaceae	*Vigna unguiculata* (L.) Walp.
Bua fayang	Flacourtiaceae	*Pangium edule* Reinw.
Felali	Hydrocotylaceae	*Centella asiatica* (L.) Urban
Ginjer	Limnocharitaceae	*Limnocharis flava* Buchenau
Lagka	Moraceae	*Artocarpus heterophyllus* Lamk.
Pau bulat	Oleanchaceae	*Nephrolepis biserrata* (Sw.) Schott

VEGETABLES - continued		
Feciruk	Ophioglossaceae	*Helmintostachys zeylanica* (L.) Kaulf.
Busak liling felanuk / Busak fayeh	Orchidaceae	*Bromheadia finlaysoniana* (Lindl.) Miq.
Pulu – bulu ee	Poaceae	*Bambusa vulgaris* Schrader ex Wendland
Pulu – bulu betung	Poaceae	*Gigantochloa levis* Merr.
Pulu – bulu telang	Poaceae	*Schizostachyum brachycladum* Kurz
Pulu – bulu poren	Poaceae	*Schizostachyum latifolium* Gamble
Pulu – bulu sebiling	Poaceae	*Schizostachyum lima* (Blanco) Merrill
Buyor (feci'; kasturi;)	Rutaceae	*Citrus microcarpa* Bunge; *Citrus maxima* (Burm.) Merr.
Lada rayeh / cabai	Solanaceae	*Capsicum* sp.
Tomate	Solanaceae	*Lycopersicon esculentum* Miller
Beliwan	Solanaceae	*Solanum americanum* Miller
Biterung eit lipon	Solanaceae	*Solanum capsicoides* All.
Biterung pulung	Solanaceae	*Solanum ferox* L.
Biterong	Solanaceae	*Solanum melongena* L.
Bua ulem	Solanaceae	*Solanum torvum* Sw.
Ubi gentang	Solanaceae	*Solanum tuberosum* L.
Lobak merah	Umbelliferae	*Daucus carota* L.
Bata	Urticaceae	*Elatostemma* sp.
Tengayen	Urticaceae	*Pouzolzia hirta* (Bl.) Hassk.
Pau abpa	Woodsiaceae	*Diplazium esculentum* (Retz.) Sw.
Pau abu / Pau kapur	Woodsiaceae	*Diplazium polypodioides* Bl.

B. EDIBLE STEM PITH		
LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Deremeh	Arecaceae	*Arenga brevipes* Becc.
Wei leludu	Arecaceae	*Calamus convallium* J. Dransf.
Wei peit	Arecaceae	*Calamus pogonacanthus* Becc. ex Winkl.
Riman	Arecaceae	*Caryota mitis* Lour.
Wei tei' lal	Arecaceae	*Ceratolobus concolor* Bl.
Wei kurad	Arecaceae	*Daemonorops didymophylla* Becc.
Wei sia	Arecaceae	*Daemonorops fissa* Bl.
Belikakau / Lekakau	Arecaceae	*Daemonorops ingens* J.Dransf.
Wei laasun	Arecaceae	*Daemonorops ingens* J.Dransf.
Wei seseit	Arecaceae	*Daemonorops longistipes* Burret
Wei lingan	Arecaceae	*Daemonorops sabut* Becc.
Wei laya	Arecaceae	*Daemonorops sparsiflora* Becc. / *D. didymophylla* Becc.
Kinangan	Arecaceae	*Eugeissona utilis* Becc.
Wei ser	Arecaceae	*Korthalsia ferox* Becc.
Ilad	Arecaceae	*Licuala valida* Becc.
Tangan / Bara	Arecaceae	*Pinanga capitata* Becc. ex Gibbs
Berang	Arecaceae	*Pinanga* sp. aff. *brevipes* Becc.
Bisian	Arecaceae	*Salacca vermicularis* Becc.
Siluk fulung	Costaceae	*Costus speciosus* (Koenig) R.M. Smith / *C. globosus* Bl.
Bong	Musaceae	*Musa* sp.
Sibak	Musaceae	*Musa* sp.
Terabak	Zingiberaceae	*Alpinia glabra* Ridl. / *A. nieuwenhuizii* Val.
Terabak fayeh	Zingiberaceae	*Alpinia ligulata* K.Schum.

C. SPICES AND FLAVOURINGS		
LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Bawang merah	Alliaceae	*Allium cepa* L.
Bawang putih	Alliaceae	*Allium* sp.
Kusei	Alliaceae	*Allium* sp.
Don sup	Apiaceae	*Apium* sp.
Piasau / Butan	Arecaceae	*Cocus nucifera* L.
Bua terur garang / ticuk mangai'	Clusiaceae	*Garcinia dryobalanoides* Pierre
Bua kecii / kayu mein / tutuberu	Clusiaceae	*Garcinia parvifolia* (Miq.) Miq.
Bua lipau	Euphorbiaceae	*Baccaurea lanceolata* (Miq.) Muell.Arg.
Kicui / Bawing kedayan / don sop	Hydrocotylaceae	*Eryngium foetidum* L.
Bawing	Lamiaceae	*Mentha* sp.
Kedingau (Kayu manis)	Lauraceae	*Cinnamomum* sp.
Tenem	Lauraceae	*Lindera pipericarpa* Boerl.
Afa' fulung	Menispermaceae	*Albertisia* sp.
Bua gitah	Moraceae	*Ficus racemosa* L. var. *elongata* (King) Barrett
Kayu bawing	Myrtaceae	*Syzigium* sp.
Gesimau	Poaceae	*Cymbopogon citratus* Stapf.
Lada	Solanaceae	*Capsicum* sp.
Likua	Zingiberaceae	*Alpinia galanga* Willd.
Kunus	Zingiberaceae	*Curcuma domestica* Valeton
Bua salleh / Bua beludu / Baku ucat	Zingiberaceae	*Etlingera elatior* (Jack) R.M.Smith
Baku tubu / Baku tubu nanong / Baku derayau	Zingiberaceae	*Etlingera punicea* (Roxb.) R.M. Smith
Halia	Zingiberaceae	*Zingiber officinale* Roscoe

D. MUSHROOMS		
LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME
Agau	-	Unknown species
Alit	-	Unknown species
Alub	Amanitaceae	*Amanita* sp.
Aleng	Pleurotaceae	*Pleurotus* cf. *djamor* (Fr.) Boedijn
Bibir kelabet	-	Unknown species
Bulu	-	Unknown species
Buda'	Lentinaceae	*Lentinus squarrosulus* Mont.
Derian	-	Unknown species
Deseit	-	Unknown species
Kecep	Schizophyllaceae	*Schizophyllum commune* Fr.
Kekudan	Lentinaceae	*Lentinus sajor-caju* (Fr.) Fr.
Lam	-	Unknown species
Langan	-	Unknown species
Likudan	Lentinaceae	*Lentinus sajor-caju* (Fr.) Fr.
Liputung	Hygrophoraceae	*Hygrocybe* sp.
Lopet	Coprinaceae	*Coprinus* sp.
Merong	-	Unknown species
Rata	-	Unknown species
Sawan	Sarcoscyphaceae	*Cookeina tricholoma* (Mont.) Kuntze

MUSHROOMS - continued		
Sia	-	Unknown species
Tana'	-	Unknown species
Tekudan	-	Unknown species
Telub	-	Unknown species
Terupong	-	Unknown species
Tinunger	Auriculariaceae	*Auricularia fuscosuccinea* (Mont.) Henn.
Tinunger becuk	Auriculariaceae	*Auricularia delicata* (Fr.) Henn.
Tutung	-	Unknown species
Upul	Lentinaceae	*Lentinus sajor-caju* (Fr.) Fr.

E. ANIMAL FOODS		
LUNDAYEH NAME	ENGLISH COMMON NAME	SCIENTIFIC NAME
Akep	Snails (freshwater)	Unknown species
Arem	Pangolin	*Manis javanica*
Badan	Small-toothed palm civet	*Arctogalidia trivirgata*
Bakaa	Boar	*Sus barbatus*
Becuk	Pig-tailed macaque	*Macaca nemestrina*
Beladan / ebu	Turtle	Unknown species
Belug	Stinging hornet / Night wasp	Unknown species
Berangad	Hose's langur / Grey leaf monkey	*Presbytis hosei*
Beruang	Sun bear	*Helarctos malayanus*
Falang alud	Banded linsang	*Prionodon linsang*
Fugeh	Slow loris &/or Western tarsier?	*Nycticebus coucang / Tarsius bancanus*
Kabuk / Kadarat	Monitor lizard	*Varanus salvator*
Kara' arur	Crab	Unknown species
Kelabet	Borneon gibbon	*Hylobates muelleri*
Kelatang	Moth larva	Unknown species
Kubeng	Flying lemur	*Cynocephalus variegatus*
Kuyad	Long-tailed macaque	*Macaca fascicularis*
Lawid	Fish	Various species
Labo afing / labo fulung / sigaa	Squirrels	Various species
Menelen	Python	*Python* sp.
Payau	Sambar deer	*Cervus unicolor*
Payu	Bearcat / binturong	*Arctictis binturong*
Pelanuk	Mouse deer	*Tragulus napu*
Ribuan	Masked palm civet	*Paguma larvata*
Seruang	Cobra	*Ophiophagus* sp.
Talau	Barking deer	*Muntiacus muntjac*
Tamai	Frog	Unknown species
Terutung	Porcupine – common	*Hystrix brachyura*
Terutung badak	Porcupine – thick-spined	*Thecurus crassispinis*
Tubang	Leopard cat	*Felis bengalensis*
Wet bulu	Sago grub	*Rhynchophorus ferrugineus*

ANIMAL FOODS - continued		
BIRDS		
Suit balud	Green imperial pigeon / Pink-necked green pigeon	*Ducula aenea*
Suit bau ulun	Malaysian Peacock Pheasant / Crested Fireback	*Polyplectron malacense / Lophura ignita*
Suit keruak	White-breasted waterhen	*Amaurornis phoenicurus*
Suit metor	Green pigeon / Wild pigeon	*Treron* sp.
Suit sukur	Spotted dove	*Streptopelia chinensis*
Suit tapiak	Bulwer's pheasant	*Lophura bulweri*
EGGS		
Suit sukur	Spotted dove	*Streptopelia chinensis*
Suit keruak	White-breasted waterhen	*Amaurornis phoenicurus*
Suit pirit	Sparrow	Unknown species
Seruang	Cobra	*Ophiophagus* sp.
DOMESTICATED ANIMALS		
Berek	Pig	*Sus scrofa*
Kerbau	Buffalo	*Bubalus bubalis*
Lal – kampong	Chicken – eggs & meat	
Sapi	Cow	*Bos indicus*

F. SHOP-BOUGHT *KIKID*
Army rations (e.g. packets of meat curry)
Tinned meat
Hot dogs
Dried meat (e.g. buffalo)
Frozen meat (e.g. frozen beef tripe; chicken wings)
Chicken eggs
Tinned fish
Salted fish
Dried prawns
Instant noodles
Pasta
Dried mushrooms
Soup – tinned
Soya bean curd

G. SHOP-BOUGHT FLAVOURINGS
Dried anchovies (*ikan bilis*)
Fermented fish paste (*belacan*)
Monosodium glutamate (MSG)
Salt
Soya sauce
Tamarind paste
Garlic
Onions

Appendix 4: Plant foods eaten as *kikid*, ranked according to frequency in the diet

Ranks were assigned according to the number of times foods were recorded in the food diaries:
1 = > 1000 records; 2 = 500 – 999; 3 = 300 – 499; 4 = 100 – 299; 5 = 0 – 99;

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME	RANK
Kuru (sia & bata)	Amaranthaceae	*Amaranthus sp.*	1
Pau sia	Blechnaceae	*Stenochlaena palustris* (Burm.f.) Bedd.	1
Sayur busak	Brassicaceae	*Brassica chinensis* Willd.	1
Sayur peit / sawi	Brassicaceae	*Brassica juncea* (L.) Czern.	1
Sedai / abi'	Brassicaceae	*Brassica juncea* (L.) Czern.	1
Sesei	Brassicaceae	*Brassica juncea* (L.) Czern.	1
Kailan	Brassicaceae	*Brassica oleracea* L.	1
Kobis	Brassicaceae	*Brassica oleracea* L.	1
Sayur picai	Brassicaceae	*Brassica rapa* L.	1
Sayur putih	Brassicaceae	*Brassica rapa* L.	1
Sayur gerinting	Brassicaceae	*Brassica* sp.	1
Siluk	Commelinaceae	*Commelina paludosa* Bl.	1
Kangkong	Convolvulaceae	*Ipomoea aquatica* Forsk.	1
Ubi waar	Convolvulaceae	*Ipomoea batatas* (L.) Lamk.	1
Timon	Cucurbitaceae	*Cucumis sativus* L.	1
Tabo	Cucurbitaceae	*Cucurbita* sp.	1
Tadjak	Cucurbitaceae	*Cucurbita* sp.	1
Ubi kayu	Euphorbiaceae	*Manihot esculenta* Crantz	1
Tengayen	Urticaceae	*Pouzolzia hirta* (Bl.) Hassk.	1
Pau abpa	Woodsiaceae	*Diplazium esculentum* (Retz.) Sw.	1
Ufa'	Araceae	*Colocasia esculenta* (L.) Schott.	2
Wei peit	Arecaceae	*Calamus pogonacanthus* Becc. ex Winkl.	2
Wei sia	Arecaceae	*Daemonorops fissa* Bl.	2
Sesila'	Caricaceae	*Carica papaya* L.	2
Tadjak fadey	Cucurbitaceae	*Benincasa hispida* (Thunb. ex Murray) Cogn.	2
Sifula / petolak	Cucurbitaceae	*Luffa acutangula* (L.) Roxb.	2
Cangkok manis	Euphorbiaceae	*Sauropus androgynus* (L.) Merr.	2
Peritak boncis	Fabaceae	*Phaseolus vulgaris* L.	2
Peritak kadang	Fabaceae	*Vigna unguiculata* (L.) Walp.	2
Lagka	Moraceae	*Artocarpus heterophyllus* Lamk.	2
Pulu – bulu betung	Poaceae	*Gigantochloa levis* Merr.	2
Kulat kecep	Schizophyllaceae	*Schizophyllum commune* Fr.	2
Dorey	Acanthaceae	*Justicia obtusa* (Nees) Lindan	3
Keduang	Acanthaceae	*Pseuderanthemum acuminatissimum* (Miq.) Radlk.	3
Deremeh	Arecaceae	*Arenga brevipes* Becc.	3
Belikakau / Lekakau	Arecaceae	*Daemonorops ingens* J.Dransf.	3
Wei seseit	Arecaceae	*Daemonorops longistipes* Burret	3
Bisian	Arecaceae	*Salacca vermicularis* Becc.	3
Kulat tinunger	Auriculariaceae	*Auricularia fuscosuccinea* (Mont.) Henn.	3
Dinudur	Basellaceae	*Basella alba* L.	3

Kaber	Bromeliaceae	*Ananas comosus* (L.) Merr.	3
Riep	Cecropiaceae	*Poikilospermum suaveolens* (Bl.) Merr.	3
Bong	Musaceae	*Musa* sp.	3
Sibak	Musaceae	*Musa* sp.	3
Kulat aleng	Pleurotaceae	*Pleurotus* cf. *djamor* (Fr.) Boedijn	3
Pulu – bulu telang	Poaceae	*Schizostachyum brachycladum* Kurz	3
Lada rayeh / cabai	Solanaceae	*Capsicum* sp.	3
Beliwan	Solanaceae	*Solanum americanum* Miller	3
Biterong	Solanaceae	*Solanum melongena* L.	3
Bua ulem	Solanaceae	*Solanum torvum* Sw.	3

Kulat alub	Amanitaceae	*Amanita* sp.	4
Ufa'	Araceae	*Alocasia* sp.	4
Bunger	Araceae	*Lasia spinosa* (L.) Thwaites	4
Sikarok / kelalang batu	Araceae	*Schismatoglottis* cf. *calyptrata* Zoll. & Mor.	4
Butu / kelalang	Araceae	*Schismatoglottis* sp.	4
Wei leludu	Arecaceae	*Calamus convallium* J. Dransf.	4
Riman	Arecaceae	*Caryota mitis* Lour.	4
Wei laasun	Arecaceae	*Daemonorops ingens* J.Dransf.	4
Wei lingan	Arecaceae	*Daemonorops sabut* Becc.	4
Wei laya	Arecaceae	*Daemonorops sparsiflora* Becc. / *D. didymophylla* Becc.	4
Ilad	Arecaceae	*Licuala valida* Becc.	4
Tangan / Bara	Arecaceae	*Pinanga capitata* Becc. ex Gibbs	4
Berang	Arecaceae	*Pinanga* sp. aff. *brevipes* Becc.	4
Kulat tinunger becuk	Auriculariaceae	*Auricularia delicata* (Fr.) Henn.	4
Riep alud	Cecropiaceae	*Poikilospermum* sp.	4
Udu daya / Udu necing	Compositae	*Crassocephalum crepidioides* (Benth.) Moore	4
Kulat lopet	Coprinaceae	*Coprinus* sp.	4
Timon abai	Cucurbitaceae	*Cucumis* sp.	4
Timon belanda	Cucurbitaceae	*Cucumis* sp.	4
Peria	Cucurbitaceae	*Momordica charantia* L.	4
Tadjak cina	Cucurbitaceae	Unknown species	4
Tukul langit	Dracaeneaceae	*Dracaena* sp.	4
Patar	Fabaceae	*Parkia* sp.	4
Peritak lebping	Fabaceae	*Psophocarpus tetragonolobus* (L.) DC.	4
Bua fayang	Flacourtiaceae	*Pangium edule* Reinw.	4
Felali	Hydrocotylaceae	*Centella asiatica* (L.) Urban	4
Kulat liputung	Hygrophoraceae	*Hygrocybe* sp.	4
Kulat kekudan	Lentinaceae	*Lentinus sajor-caju* (Fr.) Fr.	4
Kulat likudan	Lentinaceae	*Lentinus sajor-caju* (Fr.) Fr.	4
Kulat upul	Lentinaceae	*Lentinus sajor-caju* (Fr.) Fr.	4
Kulat buda'	Lentinaceae	*Lentinus squarrosulus* Mont.	4
Ginjer	Limnocharitaceae	*Limnocharis flava* Buchenau	4
Pau bulat	Oleanchaceae	*Nephrolepis biserrata* (Sw.) Schott	4
Feciruk	Ophioglossaceae	*Helmintostachys zeylanica* (L.) Kaulf.	4
Busak liling felanuk / Busak fayeh	Orchidaceae	*Bromheadia finlaysoniana* (Lindl.) Miq.	4
Pulu – bulu ee	Poaceae	*Bambusa vulgaris* Schrader ex Wendland	4
Pulu – bulu poren	Poaceae	*Schizostachyum latifolium* Gamble	4

Pulu – bulu sebiling	Poaceae	*Schizostachyum lima* (Blanco) Merrill	4
Buyor (feci'; kasturi)	Rutaceae	*Citrus microcarpa* Bunge; *Citrus maxima* (Burm.) Merr.	4
Kulat sawan	Sarcoscyphaceae	*Cookeina tricholoma* (Mont.) Kuntze	4
Tomate	Solanaceae	*Lycopersicon esculentum* Miller	4
Biterung eit lipon	Solanaceae	*Solanum capsicoides* All.	4
Biterung pulung	Solanaceae	*Solanum ferox* L.	4
Ubi gentang	Solanaceae	*Solanum tuberosum* L.	4
Lobak merah	Umbelliferae	*Daucus carota* L.	4
Bata	Urticaceae	*Elatostemma* sp.	4
Pau abu / Pau kapur	Woodsiaceae	*Diplazium polypodioides* Bl.	4
Terabak	Zingiberaceae	*Alpinia glabra* Ridl. / *A. nieuwenhuizii* Val.	4
Terabak fayeh	Zingiberaceae	*Alpinia ligulata* K.Schum.	4

Wei tei' lal	Arecaceae	*Ceratolobus concolor* Bl.	5
Kinangan	Arecaceae	*Eugeissona utilis* Becc.	5
Wei kurad	Arecaceae	*Daemonorops didymophylla* Becc.	5
Wei ser	Arecaceae	*Korthalsia ferox* Becc.	5
Siluk fulung	Costaceae	*Costus speciosus* (Koenig) R.M. Smith / *C. globosus* Bl.	5
Kulat (Agau, Alit, Bibir kelabet, Bulu, Derian, Deseit, Lam, Langan, Merong, Rata, Sia, Tana', Telub, Terupong, Tutung)		Various species of mushroom	5

Appendix 5: Edible fruit species

Ranks were assigned according to observations of the relative frequency of the fruits in the diet:
1 = frequent; 2 = common; 3 = occasional; 4 = rare; 5 = never observed;

LUNDAYEH NAME	FAMILY	SCIENTIFIC NAME	RANK
Itaan	-	Unknown species	5
Puk	-	Unknown species	5
Serudang	-	Unknown species	5
Taken / Tetaken	-	Unknown species	5
Tefuduk binei	-	Unknown species	5
War aley	-	Unknown species	5
War used	-	Unknown species	5
Teberecek buda'	Actinidiaceae	*Saurauia* cf. *longistyla* Merr.	4
Teberecek	Actinidiaceae	*Saurauia* sp.	3
Ringurin	Anacardiaceae	*Baccaurea* sp.	4
Belunu (Malay)	Anacardiaceae	*Mangifera caesia* Jack	3
Lam	Anacardiaceae	*Mangifera indica* L.	1
Felam	Anacardiaceae	*Mangifera* sp.	2
Karamut	Anacardiaceae	*Mangifera* sp.	3
Karung / Lam karung	Anacardiaceae	*Mangifera* sp.	3
Rengeh / Telaka'	Anacardiaceae	*Semecarpus bunburyanus* Gibbs	4
Durian belanda (Malay)	Annonaceae	*Annona muricata* L.	2
Nona (Malay)	Annonaceae	*Annona reticulata* L.	2
Kelang batu	Apocynaceae	cf. *Leuconotis* sp.	5
Kelang	Apocynaceae	*Willughbeia coriacea* Wall.	5
Tecung ubeh	Araceae	*Colocasia oresbia* A.Hay	4
Piasau / Butan	Arecaceae	*Cocus nucifera* L.	3
Wei kurad	Arecaceae	*Daemonorops didymophylla* Becc.	4
Likakau / Belikakau	Arecaceae	*Daemonorops ingens* J.Dransf.	4
Bisian	Arecaceae	*Salacca vermicularis* Becc.	2
Beleleh	Bombacaceae	*Durio graveolens* Becc.	2
Lapun salat	Bombacaceae	*Durio* sp.	2
Dalit	Bombacaceae	*Durio* sp.	4
Lapun	Bombacaceae	*Durio zibethinus* Murray	3
Kaber	Bromeliaceae	*Ananas comosus* (L.) Merr.	2
Sesila'	Caricaceae	*Carica papaya* L.	1
Kitong	Clusiaceae	*Garcinia bancana* (Miq.) Miq.	4
Kapab	Clusiaceae	*Garcinia* cf. *beccarii* Pierre	2
Kecii luang	Clusiaceae	*Garcinia* cf. *parvifolia* (Miq.) Miq.	3
Terur garang / Ticuk mangai'	Clusiaceae	*Garcinia dryobalanoides* Pierre	4
Mata lawid / Riaku	Clusiaceae	*Garcinia forbesii* King	3
Ubpul	Clusiaceae	*Garcinia maingayi* Hook.f.	3
Kecii / Kayu mein / Tutuberu	Clusiaceae	*Garcinia parvifolia* (Miq.) Miq.	2
Timon labo	Cucurbitaceae	*Mukia javanica* (Miq.) C.Jeffrey	3
Iti / Eki'	Elaeagnaceae	*Elaeagnus ferruginea* Rich.	3
Uleg	Elaeocarpaceae	*Elaeocarpus* sp.	3
Lipau	Euphorbiaceae	*Baccaurea lanceolata* (Miq.) Muell.Arg.	2

Pika	Euphorbiaceae	*Baccaurea lanceolata* (Miq.) Muell.Arg.	3
Pugi	Euphorbiaceae	*Baccaurea macrocarpa* (Miq.) Muell.Arg.	2
Siei	Euphorbiaceae	*Baccaurea* sp.	3
Terur berek / Terur baka / Terur payo	Euphorbiaceae	*Baccaurea* sp.	4
Tuer	Euphorbiaceae	*Bischofia javanica* Bl.	3
Fatar	Fabaceae	*Parkia* sp.	3
Fidaawee	Fagaceae	*Castanopsis acuminatissima* (Bl.) A.DC.	4
Berangan	Fagaceae	*Castanopsis costata* (Bl.) A.DC.	3
Abok	Fagaceae	*Castanopsis oviformis* Soepadmo / *C.* cf. *hypophoenicea* (Seemen) Soepadmo	3
Ukem	Fagaceae	*Lithocarpus psilophylla* Soepadmo	3
Tateh	Flacourtiaceae	*Flacourtia rukam* Zoll. & Mor.	4
Fayang	Flacourtiaceae	*Pangium edule* Reinw.	2
Labpak	Hypoxidaceae	*Curculigo latifolia* Dryand.	4
Talal	Lauraceae	*Litsea garciae* Vidal	3
Tei' suit bueng	Loranthaceae	*Dendrophthoe pentandra* (L.) Miq.	5
Silaku / Tekang	Melastomaceae	*Medinilla crassifolia* (Reinw. ex Bl.) Bl.	4
Sikali	Melastomaceae	*Melastoma malabathricum* L.	3
Merikubit	Meliaceae	*Aglaia korthalsii* Miq.	3
Terur suit	Meliaceae	*Aglaia korthalsii* Miq.	3
Fika labo / Mata lawid	Meliaceae	*Aglaia odoratissima* Bl.	3
Lingat	Meliaceae	*Lansium domesticum* Correa	2
Kelidang	Moraceae	*Artocarpus* cf. *lanceifolius* Roxb.	4
Feriubi	Moraceae	*Artocarpus* cf. *primackiana* Kochummen	3
Lagka	Moraceae	*Artocarpus heterophyllus* Lamk.	1
Fudu	Moraceae	*Artocarpus kemando* Miq.	4
Kiran / Tarap	Moraceae	*Artocarpus odoratissimus* Blanco	3
Terur talau	Moraceae	*Artocarpus* sp.	4
Talun	Moraceae	*Artocarpus tamaran* Becc.	4
Likabong	Moraceae	*Ficus* cf. *francisci* H. Winkl.	4
Feriboodok	Moraceae	*Ficus* cf. *uncinata* (King) Becc.	4
Arid	Moraceae	*Ficus megaleia* Corner	4
Lunuk	Moraceae	*Ficus parietalis* Blume	5
Gitah	Moraceae	*Ficus racemosa* L. var. *elongata* (King) Barrett	3
Lison okok	Moraceae	*Ficus* sp.	4
Emel	Moraceae	*Ficus stolonifera* King / *F. uncinata* (King) Becc.	4
Bong	Musaceae	*Musa* sp.	1
Pidara / Semendara	Myristicaceae	*Horsfieldia* sp.	4
Tereh / Decer pelanuk	Myrsinaceae	*Ardisia* sp.	4
War ilang	Myrsinaceae	*Embellia philippinensis* A.DC.	4

Lipet	Myrtaceae	*Decaspermum parviflorum* (Lam.) A.J.Scott	3
Jambu (Malay)	Myrtaceae	*Psidium guajava* L.	1
Buau / Binuber	Myrtaceae	*Syzigium foxworthianum* (Ridl.) Merr. & Perry	3
Uber	Myrtaceae	*Syzigium polyanthum* (Wight) Walp.	4
Jambu air (Malay)	Myrtaceae	*Syzigium samarangense* (Blume) Merr. & Perry; or *S. aqueum* (Burm.f.) Alston	2
Markisa (Malay)	Passifloraceae	*Passiflora edulis* Sims	2
Pisang lalid	Rosaceae	*Rubus benguetensis* Elmer	3
Serinit / Tabpa serinit	Rosaceae	*Rubus moluccanus* L.	3
Bidang	Rosaceae	*Rubus rosifolius* J.E.Smith	3
Buyor	Rutaceae	*Citrus microcarpa* Bunge; *C. maxima* (Burm.) Merr.; *C. sinensis* (L.) Osbeck; *C. medica* L.	1
Demicir	Sapindaceae	*Lepisanthes fruticosa* (Roxb.) Leenh.	4
Sia	Sapindaceae	*Nephelium cuspidatum* Bl. var. *eriopetalum* (Miq.) Leenh.	2
Rambutan (Malay)	Sapindaceae	*Nephelium lappaceum* L.	3
Beritem	Sapindaceae	*Nephelium ramboutan-ake* (Labill.) Leenh.	2
Fuder	Sapindaceae	Unknown species	5
Arau / Kuceng	Tilliaceae	*Microcos* cf. *elmeri* Merr.	4
Sifei	Urticaceae	*Debregeasia longifolia* (Burm.f.) Wedd.	4
Terebak becuk	Zingiberaceae	*Alpinia latilabris* Ridl.	3
Terebak labo / Terebak fayeh	Zingiberaceae	*Alpinia ligulata* K.Schum.	3
Terebak	Zingiberaceae	*Alpinia nieuwenhuizii* Val. / *A. glabra* Ridl.	3
Tubu beritem	Zingiberaceae	*Alpinia* sp.	4
Tubu bigan	Zingiberaceae	*Amomum* cf. *polycarpum* K.Schum.	4
Salleh	Zingiberaceae	*Etlingera elatior* (Jack) R.M.Smith	1
Tubu / Baku derayau	Zingiberaceae	*Etlingera punicea* (Roxb.) R.M. Smith	3
Teladan	Zingiberaceae	*Hornstedtia affinis* Ridl.	3
Teladan becuk / Teladan fayeh / Teladan buki	Zingiberaceae	*Hornstedtia scyphifera* Steud.	3
Tubu becit	Zingiberaceae	*Plagiostachys crocydocalyx* (K.Schum.) B.L.Burtt & R.M.Sm.	3
Tubu terutung	Zingiberaceae	*Plagiostachys* sp.	4