Towards a Theory of Substance and Form: A Contextual Analysis of Kiau Dusun Plant Knowledge in Sabah, Malaysian Borneo.

Ph.D Environmental Anthropology Dissertation

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ABSTRACT

The debate over the substance and form of indigenous plant knowledge is often characterised by a divide between cultural (Harris, 1988) and biological (Boster, 1987) explanations that have proven to be theoretically weak. A holistic approach is needed to account for the interactive influence of a variety of variables on the development of indigenous plant knowledge (Boyd and Richerson, 1985). Efforts such as the Human Ecosystems approach advocate a processual study of how indigenous knowledge is influenced by dynamic circumstances found in a variety of social, cultural, biological and physical environments (Wyndham, 2002). I explore the contextual nature of Kiau Dusun plant knowledge in three ways: first, variations in the knowledge about different kinds of plants; second, variations in the knowledge that different people have about plants; and third, variations in the expression of plant knowledge in relation to circumstances in normative reality. I argue that Kiau Dusun plant knowledge reflects how the Kiau Dusun fit within the wider and localised frameworks of their human and natural ecologies. Free listing exercises and semi-structured interviews along a plant trail resulted in quantitative data that, combined with surveys and participant observation, reveal intriguing patterns of how Kiau Dusun plant knowledge is fragmented. There is a growing body of declarative plant knowledge that no longer has a viable form of sustained practical application. Results also suggest that enacted plant knowledge concentrates mainly on plants that are directly relevant to the daily routine, in addition to innovative ways of interacting with the plant world such as tourism. Focus is given to the complex historical processes that continue to shape Kiau Dusun interactions and conceptualisations of the plant world, such that a salient body of Kiau Dusun plant knowledge reflects an ongoing and proactive negotiation about the relevance of plants in contemporary Kiau Dusun contexts.

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Table of Contents

CHAPTER ONE: SUBSTANCE AND FORM

Theories become clear and "reasonable" only after incoherent parts of them have been used for a long time. Such unreasonable, nonsensical, unmethodical foreplay thus turns out to be an unavoidable precondition of clarity and of empirical success.

Paul Feyerabend (1976)

SECTION ONE: INTRODUCTION

1.1.1. Romance[1]

Once upon a time, in a land far away, the great rock Nabalu[2] towered majestically over the dense rainforests of northern Borneo. Spirits of the ancestors dwelt on its high craggy peaks, while below, nestled within the forested valleys, there lived the tribe of Kiow[3]. These were a handsome tribe of headhunters whose might numbered more than 2,000 fighting men[4]. Their fields cloaked the hillsides with rice, taro and tobacco; they fed off deer and rats hunted in the forests; and their women wove a delicate cloth from the coarse fibres of forest plants[5]. The tribe was governed by a headman, the council of elders, priestesses, and the circle of warriors; their law was called *adat*[6]. It was a wisdom accumulated over generations and a covenant over the good of the community. Decisions were jointly discussed and mutually agreed upon.

Then, some years later, something happened. Intruders from a foreign land came to their village and told the tribe that they were now denizens of a British Crown Colony[7]; they were subjects of a new law[8] where *adat* was inconsequential and headhunting was out of the question; and with these intruders came scientists who picked through the great rock Nabalu as though it were a dead rat[9]. They were also told that they were a tribe of pagans who needed to be converted to Christianity; they were savages who needed to be educated; and that they had to pay taxes[10]. Damn those taxes!

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[1] This is a lyrical version of historical reality - in the spirit of the genre, references for this part are cited as footnotes. For the rest of the dissertation, references are cited in the main text.
[2] Regis, 1996
[3] "tribe of Kiow " was the term and spelling used by Hugh Low in 1851, cited in Moulton, 1915 pg. 139
[4] Observation made by Hugh Low in 1851, also cited in Moulton, 1915
[5] St. John, 1986; Whitehead, 1991
[6] Lasimbang, 1996
[7] Singh, 1981
[8] Appell & Harrison, 1969; Lasimbang, 1996
[9] Jenkins, 1996
[10] Rutter, 1985

Luckily, some more years later, these intruders left. In their place however, came a new central government. The tribe was told this new government was made up of people from all kinds of tribes in this land[11]. They were told this land is now called Sabah, and their village, along with the rest of Sabah, was part of a new country called Malaysia[12]. Their fears, gushing anew, were swiftly allayed when they were told that the government of Sabah, which was after all made up of people from all kinds of tribes in Sabah, would look after them and strive to make their lives better. The tribe was told they were no longer a tribe. Now they are known as an indigenous society. The government said that to make their lives better, they needed to modernise. The government gave them subsidies, schools, and hospitals to wipe out poverty, illiteracy and disease. Their village was given electricity to power their televisions, and roads so they could drive into the city and enjoy the cyber cafés. Modernise, they were told; develop, they were told; because Malaysia *boleh*, and Sabah too, *boleh*![13]

1.1.2. Reality

There is nothing better than a good romance novel to whisk me away from the sticks of reality. It fashions reality such that life sounds so simple, so possible, so almost true, that I yearn for another dose of it. In contrast, reality sounds so complicated, so cumbersome, rather bothersome, and really quite heavy. It is under this weight that I begin marking out some parameters for my discussion on the indigenous plant knowledge of the Kiau Dusun community in Sabah.

Indigenous peoples, indigenous communities, or indigenous societies refers to people or descendants of peoples "who inhabited a country, or geographic region to which the country belongs, at the time of conquest or colonization or the establishment of present state boundaries, and who - irrespective of their legal status - retain some or all of their own social, economic, cultural and political institutions" (Laird, 2002 pg. 457). Thus the plant knowledge of the Kiau Dusun indigenous community refers to "a body of knowledge and beliefs [about plants] transmitted through oral tradition and first-hand observation. It includes a system of classification, a set of empirical observations about the local environment and a system of self-management that governs [plant] use" (Laird, 2002 pg. 460). In this sense, a non-literate or traditional society refers to a society or community that uses an oral tradition in the transmission of indigenous knowledge, irrespective of the formal literacy skills that some or all members of the community may have. Finally, the terms "traditional" and "modern" are used frequently throughout this dissertation, but they by no means allude to some kind of definitive temporal gateway where all things occurring before a certain time were considered "traditional", and

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[11] Reid, 1997

[12] Jones, 1966; Lasimbang, 1996

[13] Literally meaning, "Malaysia can, Sabah can". Current national unity slogan found in media broadcasts and billboards, as well as on the party packs of the 9th Malaysia Games held in Kota Kinabalu, Sabah, 5-14 September 2002

those occurring after are considered "modern". I[14] use the terms in their most literal sense as an aggregate of different, but nonetheless contemporary, features, such that boundaries of "tradition" and "modernity" are infused over time and space by virtue of historical processes. So while a "traditional society" may use the oral tradition in the transmission of indigenous knowledge, it nonetheless is an equally "modern society" when these same community members are in possession of secondary and tertiary qualifications.

The arguments presented in this thesis draw upon a number of theoretical trends in the anthropological literature that explore human behaviour in relation to the natural environment, whereby indigenous plant knowledge is represented as a living record that reflects this human-nature interaction. In particular, earlier trends have been characterized by a debate between proponents of cultural factors versus those who advocate biological factors as explanations for human interaction with the natural world. Cultural deterministic approaches, for example, portray the development of indigenous plant knowledge as part of an adaptive mechanism inherent in human cultures that allows for more efficient human appropriation of the plant world. Harris (1988) argues that indigenous communities (and indeed, all human societies) possess an adaptive ability that allows them to overcome the changing circumstances in their natural environment, an ability that also serves to safeguard the ecological stability of their living habitat. This notion that the diversity of modes of human interaction with, and appropriation of, the natural environment is a function of cultural adaptiveness has been met by fierce criticism especially in cases where practices of indigenous communities provoke negative environmental consequences (e.g. over-harvesting of forest resources, ecological degradation as a result of swidden agriculture in sensitive areas).

At the other side of the debate, cognitive anthropologists, for instance, argue that human interaction with the natural environment is not merely an adaptive reaction to biological and ecological stimuli, but is founded upon an inherent intellectual understanding of biological forms and structures. This viewpoint argues that indigenous peoples have a complex cognitive map of biological reality that is independent of culture (Boster, 1987). Berlin (1992) applies this perspective to the classification of plants, by arguing that the conceptualisation of plants is founded on cognitive processes that apprehend how the plant world is organised in the minds of indigenous peoples as perceptual units that discern the similarities and differences in the morphological characteristics of plants. This view draws some strength from research in cognition as the basis of human perception of the surrounding environment, and thus presents the indigenous person as someone who intelligently perceives, rationalises, and thereby utilises the plant world. Indeed, proponents such as Hunn (2002) argue that there are innate cognitive

[14] This refers to my own writing only, and is not necessarily the case with quotations cited from references

and biological predispositions to acquire knowledge of natural kinds. Children from a very young age can have elaborate plant knowledge, which is suggestive of certain innate learning mechanisms for natural forms. Others, such as Ingold (1992), argue that environmental knowledge does not need to be organised in such cognitive complexity in the minds of indigenous peoples, but can be acquired through direct perception. This "dwelling" perspective suggests that indigenous plant knowledge is acquired, and as a matter of course, transformed by virtue of directly engaging with the plant world (Ingold, 2000). In arguing along these lines, these perspectives tend to undermine the cultural significance of plants, such that the order of natural kinds *per se*, whether acquired through cognitive apprehension or direct engagement, does not adequately explain situations where plants can be attributed multifaceted roles in ever-changing socio-cultural environments.

I contend that the debate between socio-cultural and cognitive-biological explanations of human behaviour is becoming increasingly dated, particularly where it concerns indigenous plant knowledge. Indigenous plant knowledge, otherwise referred to as traditional botanical knowledge, encompasses shared and specialised knowledge, beliefs and skills about the biological, ecological, social and cultural characteristics of plants. This includes the knowledge of plant morphology, habitat, ecological interrelations and interdependencies, cultivation and management, folk names, uses and symbolism. As a body of knowledge that encompasses a wide diversity of characteristics, there seems to be little merit in attempting to explain the development of indigenous plant knowledge on the basis of a singular theoretical perspective. Boyd and Richerson (1985, pg. 281) call for a "synthetic rather than stratigraphic conception of the aspects of human behaviour," in making the basic assumption that all variables whether cultural or biological play a role in human evolution. The authors argue that on the assumption of this truism, it is then possible to formulate a holistic model that includes all variables, thereby leading to the more interesting study of the *processes* that allow particular variables, or combinations of variables, to occupy causal priority at particular points in time and space. In other words, adopting an integrative approach would divert from the study of singular variables, whether culture, cognition, or biology, to a study of how these various variables interact (and are inherited) over generations of indigenous peoples. This evolutionary perspective also allows for change to occur in the development of indigenous plant knowledge because the study of interactive and integrative processes is preconditioned upon having an historical context whereupon such processes are enacted.

One such attempt at constructing a unifying conceptual framework for indigenous knowledge was proposed by Toledo (2002), as part of a larger ethnoecological approach to both the intellectual and practical processes implicated in the human appropriation of nature. Toledo

forwards the notions of Kosmos (beliefs), Corpus (knowledge) and Praxis (practices), where each component is intrinsically and mutually linked. It is, perhaps, a rather *emic* perspective of how indigenous peoples' cosmology, collective and individual memories and experiences, and material actions, jointly interact to form internal representations of the natural environment over time and space, which therefore implicates the epistemological, cultural and productive influences in indigenous knowledge. It is an attractive framework that unfortunately falls into what Boyd and Richerson (1985, pg. 281) term "the commonsensical middle position [that] has nothing to offer except the truism" that all variables do play a role in how humans perceive and interact with the natural world. It is, perhaps, the abstract nature of the categories Kosmos, Corpus and Praxis that present difficulties in, firstly trying to identify processes and, subsequently trying to untangle various processes that operates within and between categories.

A more convincing framework can be found in the human ecosystems approach, which attempts to build a holistic working model that explains the development of indigenous knowledge (Wyndham, 2002). The underlying assumption is that human ecologies operate on the basis of multiple socio-cultural, biological and physical environments, where information is exchanged by virtue of communication (which in itself can be represented as a semiotic environment). It is a processual approach that examines how these multiple environments interact and influence the acquisition, distribution, and development of indigenous knowledge. Thus while knowledge can occupy the individual mind (cognitive environment), knowledge is also shared between individuals and among groups (social and cultural environments), just as much as knowledge can be vested in material objects, living things (biological and physical environments) or the spoken word (semiotic environment). As these environments are neither mutually exclusive nor static constructs, the model allows us to weigh, and reflect upon, the contextual influences of a particular environment, or combinations of environments, as an ongoing process over time and space. No single variable can occupy causal priority as a given universal, simply because the interactive and integrative nature of these multiple environments explicitly require any number of variables to be judged in relation to the context within which they are found to occur. In this light, indigenous knowledge is indeed a living record of the human relationship with their surrounding environments where all variables fulfil the truism of playing a role in this relationship, and where circumstances in these dynamic environments both constrain and facilitate how indigenous knowledge develops.

In this dissertation, I describe research on the indigenous plant knowledge of the Kiau Dusun community in Sabah, based on data collected from 1998 to 2002. I argue that the substance and form of indigenous plant knowledge is dependent upon dynamic contextual circumstances found in the surrounding human and natural environments. I, however, limit my exploration of

plant knowledge to the investigation of plant names, life forms, and uses, as a subset of the larger body of Kiau Dusun plant knowledge. I feel that an investigation of plant names, life forms and uses provide an appropriate entry to understanding how the plant kingdom is recognised and conceptualised under different contextual circumstances, such that the overall investigation of this subset of plant knowledge provides an indication, albeit preliminary, of the varying degrees to which plants are part of a changing Kiau Dusun community.

In this chapter, I begin with a treatment of cognition as the basis for discussing how plant knowledge is formed under dynamic contextual circumstances. This is followed by a treatment of ethnobiological categorisation as the precursor to an exploration of how plants are recognised and conceptualised, that is, the substance of plant knowledge. These ideas underpin the unfolding of my research and the architecture of this dissertation, where in chapters two and three, I discuss the various contextual environments that play a role in how the Kiau Dusun relate to their surrounding environments. In chapter four I discuss the methodological techniques applied in the field as part of a practical exploration of the variations in plant knowledge across a diverse sample of informants. Chapter five concludes this dissertation by reflecting on how Kiau Dusun plant knowledge can continue to develop, in both substance and form, given the ongoing contextual changes that underlie the relationship between the Kiau Dusun and their surrounding environments.

SECTION TWO: COGNITION

1.2.1. A basis for knowledge

Early on, theories in cognitive psychology argue that physical reality, at its most basic level, is comprised of sensory information (Lachman *et al..*, 1979). There are basic physiological mechanisms that govern the perception of sensory information, either through sight, sound, smell, taste, touch, as well as proprioception[15]. Cognition refers to the processing of this sensory information, as when one set of sounds is recognised as an invitation to dance while another set of sounds is recognised as the beat of gongs. Further processing of a patch of light and colour is recognised as a face and body, a young Dusun lad in a baggy green T-shirt and denim jeans, with his arm held out to receive me. I take a last swig of my drink - the sticky sweet taste that I recognise as *lihing* (rice wine) - and place my glass on a brownish angular surface that I recognise as a table. Together we shuffle onto the dance floor, my arms and feet moving to the sounds of gongs - in the background I hear someone scream a birdcall and people laughing.

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[15] Proprioception refers to sensory information mainly from the vestibular apparatus (in the ear) so that we know where we are in space. In other words, knowing the position of each body part in space, and what each body part is doing relative to other body parts (Bernstein et al, 2003).

This encounter can be broken down to its most basic sensory units of information. This sensory information is channelled through the human brain by virtue of neuronal processes; in so much as it is channelled through the human mind by virtue of cognitive processes. It is important to note the difference between sensory perception, for example the elementary perception of sounds, and cognition, which is the higher level, sophisticated process that translates perceived sounds into some form of recognition - language. In this sense, it is easy to accept that while I am consciously processing such sounds as part of learning to speak Dusun, cognition can also happen even without me being aware of it. For instance, cognition processes the movement of my arms and feet as the *Sumayau* dance, and the recognition that I am dancing a rather clumsy rendition of it. This realisation motivates me to try harder to reproduce the dance steps I had memorised. In the same way, a memory of spilling my *lihing* the last time I danced motivates me to leave my glass behind on the table. I also remember the last time I left a glass of *lihing* unattended that someone had walked over and drunk it for me, thus I empty my glass before setting it on the table. Furthermore, what I already know about Dusun customs tells me that I should not dance so close to this young lad. The sensory information contained within this encounter is cognitively processed so that new information is acquired and existing information in memory is used. Most importantly, cognition fits information with the context, so that sounds and sights are processed in relation to the context they occurred in (Wyer *et al.*, 1989). In this way, the bits of sensory information I perceive interact with other bits of information in memory and build up to some kind of meaning. Thus I have the knowledge that I am at a wedding party, having consumed my sixth glass of *lihing* and am dancing with the *Ketua Kampung's* (village headman's) son, and so should not get too flirty.

1.2.2. Cognition

Cognition has been proposed as the basic mechanism for generating knowledge, an argument that has been used in many key papers in anthropology (Atran, 1996; Berlin, 1992; Carey, 1996, Ellen, 1993; Ingold, 1993; Rosch, 1978), and is the theoretical foundation for my approach here. Knowledge, and indigenous knowledge in particular, is both intellectual and practical. Knowledge that is intellectual refers to theoretical knowledge, in that it is a kind of knowledge that is not put to practice. Conversely, knowledge that is practical refers to knowledge that is skill-based or enacted. Finally, both theoretical and practical knowledge can also be referred to as declarative knowledge, in cases where that knowledge can be verbalised or described through the spoken word (versus the kinds of practical knowledge that require the act of demonstration to illuminate the process). Thus I may have knowledge about the *Sumayau*, its history, symbolism, variation, and even memorised the dance steps. It is, however, altogether another matter to dance it. To do this I would need more bits of practical information about how my

body should be moving to the rhythm of the gongs, and with enough practice, I would know how to dance the *Sumayau* without a laughing audience.

According to cognitive psychologists, cognition occurs along three basic stages: encoding, memory, and retrieval. This basic model, termed the modal model of memory, was initially proposed by Atkinson and Shiffrin (1968), and has since been used as the foundation for understanding human information processing (Eichenbaum, H, 2002; Lachman *et al.*, 1979). Information enters our minds through a process of encoding, is retained in memory, and is later retrieved for output. In its strictest sense, cognitive psychologists define retrieval of information from memory as a measure of spilt second occurrences; that is to say, retrieval is largely below our threshold of consciousness (Bjork and Bjork, 1996). Cognitive psychology uses the methodology of computerised reaction time tests to examine conditions for retrieval. When retrieval is primed according to various contexts, the reaction time test will result in slower or faster reaction times depending on the nature of each context (Rosch, 1978). This is termed the context effect, that is, the way different contexts influence cognitive processing in different ways. Anthropological methodology, however, does not employ reaction time tests, perhaps because the technology itself will impart a particular (often undesired) context effect onto our informants, especially when working with small-scale indigenous societies in remote locations. As a matter of fact, anthropological methodology, whether it is oral histories, journals, interviews, participant observation, or participatory appraisals, are exercises that are embedded in context. Anthropology is unable to (and why should it try to?) methodologically separate information from context in the same way a reaction time test claims to achieve (Ellen, 1996). Thus in terms of a cognitive information processing model, anthropology would rely on a measure of expression rather than retrieval - in the split second that information is retrieved from memory it is subsequently expressed within a particular context (see Figure 1.2.1.). A measure of expression denotes the examination of a context effect, whether it is a 'naturally' occurring context, the context of an interview along a tree trail, community workshop, or skill contest.

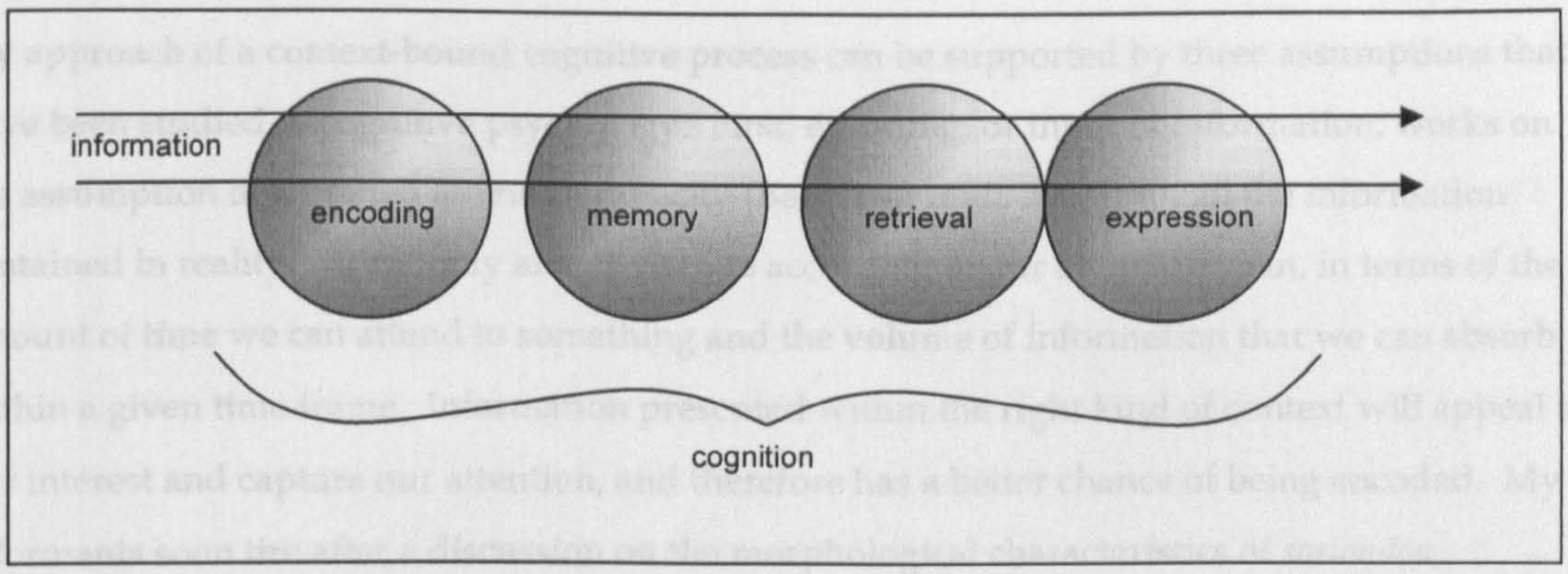

Figure 1.2.1. Cognitive model of information processing

This methodological limitation in anthropology is an important factor to consider when studying variations in indigenous knowledge. For that matter, data presented in this thesis are all context-bound: investigation of the Kiau Dusun within the context of their human and natural ecology; plants within the context of morphological or utilitarian features; the collection of voucher specimens within the context of the El Niño drought; or very minimally, data obtained within the context of a researcher-informant relationship. In short, the cognitive information processing model that I am working with is framed within the complexity of existing context effects (cf. Rosch, 1978) (see Figure 1.2.2).

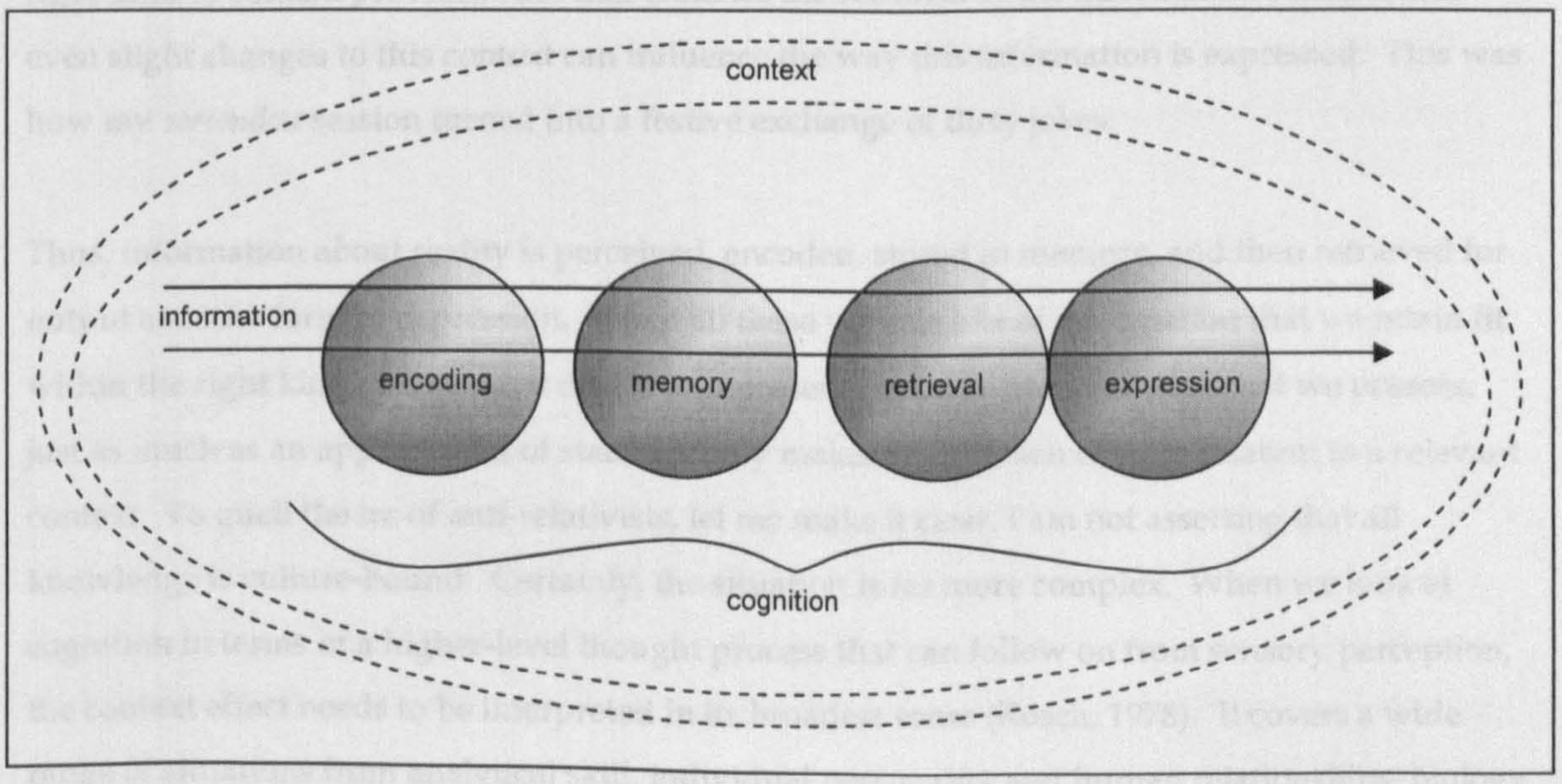

Figure 1.2.2. The happy face: context-bound cognitive information processing

1.2.3. The context effect

My approach of a context-bound cognitive process can be supported by three assumptions that have been studied in cognitive psychology: First, encoding, or input of information, works on the assumption of a limited attention capacity (Bernstein *et al.*, 2003). Of all the information contained in reality, we are only able to encode according to our attention span, in terms of the amount of time we can attend to something and the volume of information that we can absorb within a given time frame. Information presented within the right kind of context will appeal to our interest and capture our attention, and therefore has a better chance of being encoded. My informants soon tire after a discussion on the morphological characteristics of *soriondou* (*Eurycoma longifolia*), but switch to the aphrodisiacal properties of this plant, and the whole veranda erupts in chatter. Second, memory works on the assumption of a limited carrying capacity (Bjork and Bjork, 1996; Wyer *et al.*, 1989). It is questionable whether we have the capacity to remember all the information that we perceive. For instance, some information is only remembered for a limited period of time before it is forgotten, while other bits of information are remembered selectively. But with the right kind of context, memory can be jogged and strengthened. Intrigued by the proclaimed potency of the *soriondou*, there were some informants who made a point of remembering the morphology of the *soriondou* so they could look for it in the forest, they remembered the method for preparing the aphrodisiacal tonic, and it spurred on the exchange of other step-by-step home remedy aphrodisiacal recipes between many informants. Third, as I have already discussed, expression works on the assumption of context. We do not have the capacity to retrieve all the information stored in memory in one go. The right kind of context provides cues that enhance the retrieval of the information I desire, and even slight changes to this context can influence the way this information is expressed. This was how my *soriondou* session turned into a festive exchange of dirty jokes.

Thus, information about reality is perceived, encoded, stored in memory, and then retrieved for output as some form of expression. When all these various bits of information that we retain fit within the right kind of context, it comes to represent the body of knowledge that we possess, just as much as an appreciation of statistics only makes sense when cited in relation to a relevant context. To quell the ire of anti-relativists, let me make it clear, I am not asserting that all knowledge is culture-bound. Certainly, the situation is far more complex. When we look at cognition in terms of a higher-level thought process that can follow on from sensory perception, the context effect needs to be interpreted in its broadest sense (Rosch, 1978). It covers a wide range of situations from analytical skill, individual personality and human relationships, biology and ecology, to the wider social, cultural, economic and political factors within the changing human and natural ecology (Ellen, 1993). In this case, culture, or biology for that matter, is but one kind of context among the many other ways we can frame our thought processes.

Furthermore, the cognition-context interface is not unidirectional because while the context influences cognitive processing of information, cognition in turn produces responses that impact upon the context. It is what I term the multiple feedback loop of how cognitive information processing and context interact to form knowledge, which is the main concern of this research.

1.2.4. The cognition-context interface

In relation to the plant knowledge of the Kiau Dusun, I address the cognition-context interface in three ways: what I term the *domain of thought* account, the *eye of the beholder* account, followed by the *principle of fit* account. In other words, the context of the object of perception (i.e. plant domain) and the context of the perceivers themselves (i.e. Kiau Dusun beholders) interact with their cognitive processing of information, and therefore shape the nature of their knowledge. For this knowledge to be viable, it needs to fit with reality.

1.2.4.1. Domain of thought

In this case, the *domain of thought* is the plant kingdom. For the purposes of this dissertation, I concentrate on an investigation of how plants are conceptualised, that is, by exploring variations in the knowledge people have about the names of plants, variations in the descriptions of plant life forms[16], as well as variations in how the plants are used. That plants, as an object of perception, can be conceptualised in different ways depending on the context that frames the enquiry is hardly groundbreaking news (Ellen, 1996). Certainly, plants can be conceptualised in a variety of contexts, for example, according to phylogenetic and evolutionary criteria, morphological and biological criteria, pharmacological criteria, or utilitarian criteria. Another example of context is how the same plant would appear differently under different conditions: in good weather it would be flourishing, but in the middle of the El Niño drought it would be sterile and saggy.

My experience shows that the *Rafflesia* is merely a big smelly red flower that happens to grow on a Dusun farmer's land, and will subsequently be chopped up and burned to open the land for cultivation. If however, the *Rafflesia* is presented as a rare and endangered species, whose blooms can attract substantial sums of money by charging a head tax on the bus loads of tourists who flock to view it, then the big smelly red flower will come to acquire a different meaning to the Dusun farmer. The farmer may come to value his big smelly red flower, study its life cycle, understand how to look after its habitat, so that this *precious* big smelly red flower will flourish

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[16] Life form categories are often distinguished by what botanists refer to as stem habit, or the morphological characteristics of a plant's stem (Berlin, 1992). For the purposes of this dissertation, I use the categories of life forms to represent these distinctions in stem habit, and vice versa

and earn him some money. As it turns out, more money than he would have earned had he turned the *Rafflesia* habitat into a swidden field[17].

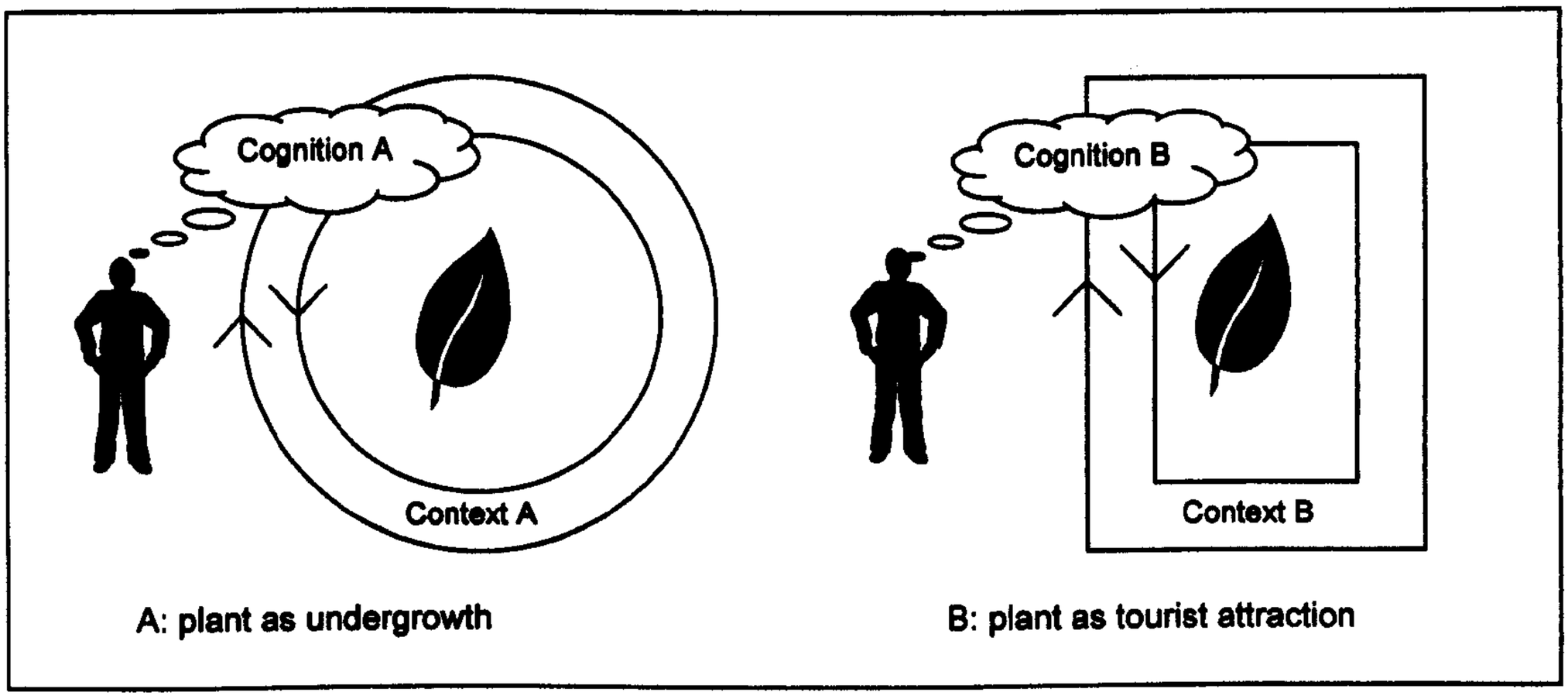

Figure 1.2.3. The *domain of thought* cognition-context interface

Thus the fact that "there is a *Rafflesia* growing on my land" can be framed in these two contexts (see Figure 1.2.3.). Either context imbues the plant with a different value, and either value has a marked influence on how the farmer comes to conceptualise the *Rafflesia*. In case A, he destroys the *Rafflesia* and gets on with it. In case B, he protects the *Rafflesia* and goes on to build a whole body of knowledge about the plant and its natural habitat.

1.2.4.2. Eye of the beholder

Just as much as the Kiau Dusuns have concepts about plants, so too do they have concepts about themselves. The way the Kiau Dusun think of themselves, or in other words, their self-concept is a "dynamic principle which acts to internalise society as part of cognitive functioning" (Turner and Oakes, 1997 pg. 365; also Ellen, 1993). This field of theoretical investigation in social psychology suggests that the self is as much a social identity as it is a personal identity (Csordas, 1994; Tajfel, 1981). The boundaries of the self-concept are fluid, in that the Dusun farmer can see himself as a human being, in as much as he can also see himself as a male, a Dusun, a swidden farmer, a supporter of a particular political faction, and someone who likes to eat ginger. In short, the perceiver locates himself in relation to the wider context of his surroundings, which means his self-concept can be different (and even contradictory) depending on how he internalises the situation he is in.

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[17] This example is based on a community-based *Rafflesia* conservation project around Kinabalu Park (1996-2001), that I was involved in to a very minor degree. Full credit for the insights and successes of the project must go to the project pioneer - Dr. Jamili Nais of Sabah Parks (see Nais & Wilcock, 1998).

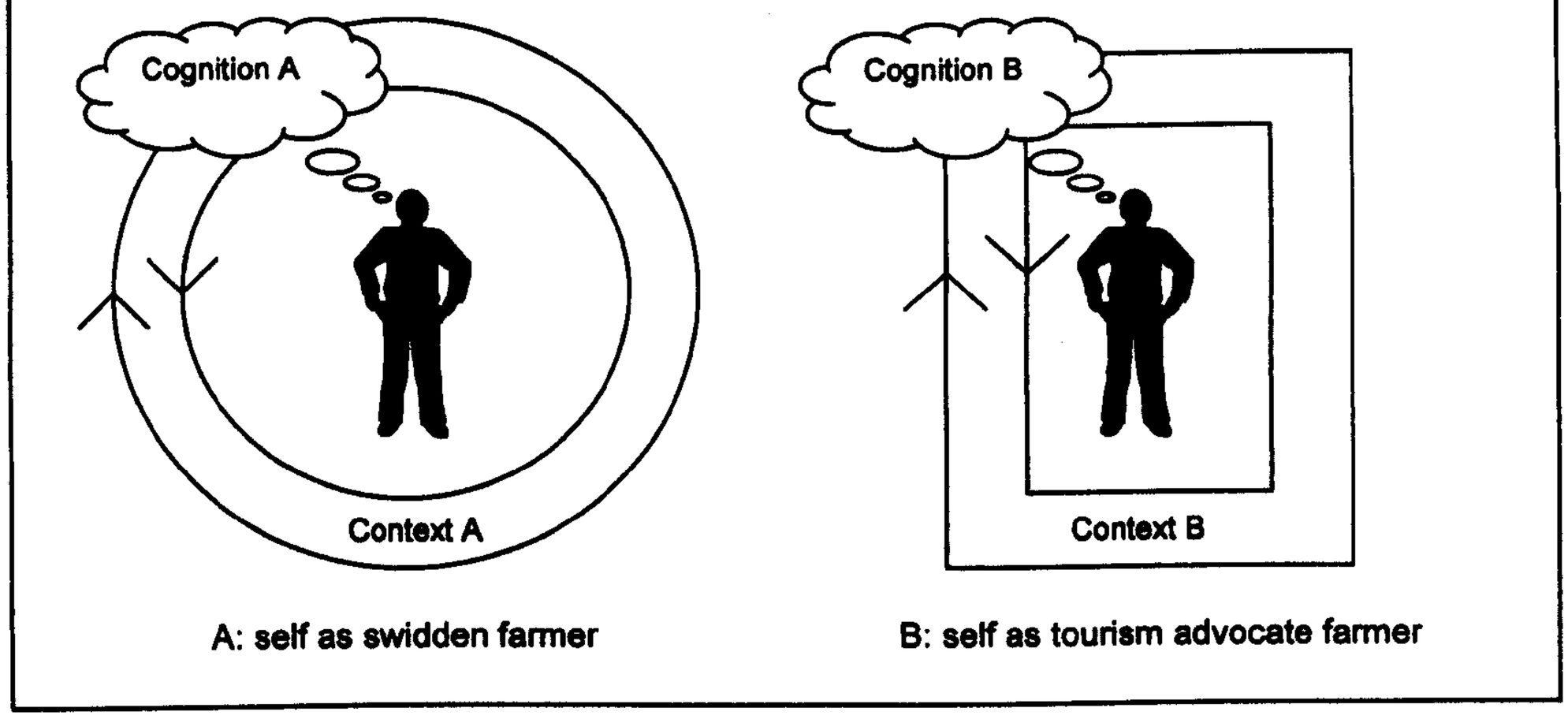

Figure 1.2.4. The *eye of the beholder* cognition-context interface

Turner *et al.* (1994 pg. 455) argue that "variation in how people categorise themselves is the rule rather than the exception and that the collective self arises as part of this normal variation". In other words, people perceive the similarities and differences between each other, and this perception is what underlies social groupings (Brown, 2000). The idea is that perceived similarities between people motivate these people to form in-groups, while perceived differences motivate the formation of out-groups. Thus people in Kiau who wish to convert forests for tourism can see themselves as distinct, in this respect, from other people in Kiau who wish to convert forests for swidden agriculture (see Figure 1.2.4.). This has led to pro-tourism farmers who impart an attitude of opening forests for jungle camps and *Rafflesia* farms, against the existing attitude of opening forests for agriculture and destroying all the *Rafflesia* in the process. This shift in the perception of forest value is not just because a pro-tourism context "out there" has influenced people in Kiau. Rather, it is because a group of people in Kiau have internalised what they believe is an economic opportunity; they see themselves as tourism advocates, they proactively seek out information, and thus build a body of knowledge, that will support their stance. It is also the way Kiau Dusuns can see themselves as a distinct identity from the Tambunan Dusuns for reasons that reinforce their perception of "Kiau Dusun-ness", and at the same time can see themselves and the Tambunan Dusuns united under a Kadazandusun identity that is distinct from the Bajaus.

In terms of Self-categorisation Theory and Social Identity Theory (Brown, 2000; Tajfel, 1981; Turner, 1985), these self-concepts represent the social identities of perceivers that translate the "variation of one's 'social place' into the selective representation of phenomena from the vantage point of the perceiver" (Turner and Oakes, 1997 pg. 365). Perceivers are directly engaged with their environment, making rationalisations about how they fit within these environments, and at the same time, making judgements about which other people share similar (or different)

circumstances. The *eye of the beholder* account, therefore, argues that elements of the human ecology, often neatly organised into demographic categories of gender, age, occupation and education, are cognitively processed and internalised as a variable self-concept, or social identity. It is a convincing model for how the self, both individual and social, is embedded in circumstances found in a dynamic contextual reality.

1.2.4.3. Principle of fit

Fit means the ability of the conceptualisation to match reality. At the very basis of plant knowledge is the ability to identify the plant – this is the issue of comparative fit, that is, the ability of the stimulus to have sufficient characteristics that match the prototypical concept (Marques *et al.*, 1998; also Berlin, 1992). So a bit of undergrowth will be conceptualised as a particular identity only when there are sufficient characteristics in that plant to convince us that it is indeed a kind of *Rafflesia* (and not some other plant). Similarly, the self-concept relies on the ability of our own characteristics to match the prototypical characteristics of our concept – the farmer will see himself as a tourism advocate if he believes that he demonstrates behaviours and attitudes that are akin to other tourism advocates. When a match is found, the corresponding concept becomes salient (Marques *et al.*, 1998).

The second and more relevant (to this dissertation) part of *fit* is normative fit, that is, the match between the salient concept and normative reality. The self-concept "must match the relations between the self and others in terms of normative fit, or content" (Turner *et al.*, 1994). To walk into Kiau and see myself as the spiritual healer of the community would be inconsistent with the normative situation in the village where I am merely a researcher (of course if circumstances in reality were to introduce new developments, then I would be persuaded to rethink my concepts). Thus even though all kinds of concepts can exist (self-imposed or otherwise), a concept will become less viable when it is inconsistent with reality.

So, normative fit can also mean that when there is no match between reality and concept, these concepts can become irrelevant and thus the knowledge of them becomes less viable. For example, at the birth of his first child, Sopinggi Ladsou consults with his mother on how to prepare a post-natal tonic to help his wife's recovery. It is a recipe of seven plants. At the birth of his second child, he calls upon his mother again to remind him how to prepare the tonic. By the birth of his third child, he knows how to prepare the tonic himself. Another seven births later and Sopinggi is not only an expert on preparing this tonic, but he also knows the names, life forms, and distribution of each of the seven plants in his recipe. Sopinggi however, is not a biochemist, so he cannot tell me about the pharmacological properties of these plants. Furthermore, his area of expertise is largely limited to the select few medicinal plants that have

been relevant to him. Since it has been some years since the birth of his tenth, and last child, he has found no need to prepare this tonic any longer. Now he has some difficulty in describing this knowledge because it has not been directly relevant his current situation for some years now. Even though the knowledge still exists in him, it exists, in some sense, as declarative rather than enacted knowledge where its future viability depends on how much longer this knowledge can continue to *fit* with the circumstances of his normative reality.

What is perhaps more interesting, is the question of how we seek out a suitable fit between our concepts and normative reality. Rosch argues, "When a context is not specified in an experiment, people must contribute their own context. Presumably, they do not do so randomly" (Rosch, 1978; pg. 43). So a Dusun who sees himself as a mainstay swidden farmer would seek to keep his plant conceptualisation of a *Rafflesia* as undergrowth because this fits within his normative reality of chopping up and burning undergrowth to open land for cultivation (see Figure 1.2.5.); in the same way that a botanist would seek to keep plants within the context of morphological features so that the information obtained would fulfil his enquiry about folk classifications of plant morphology.

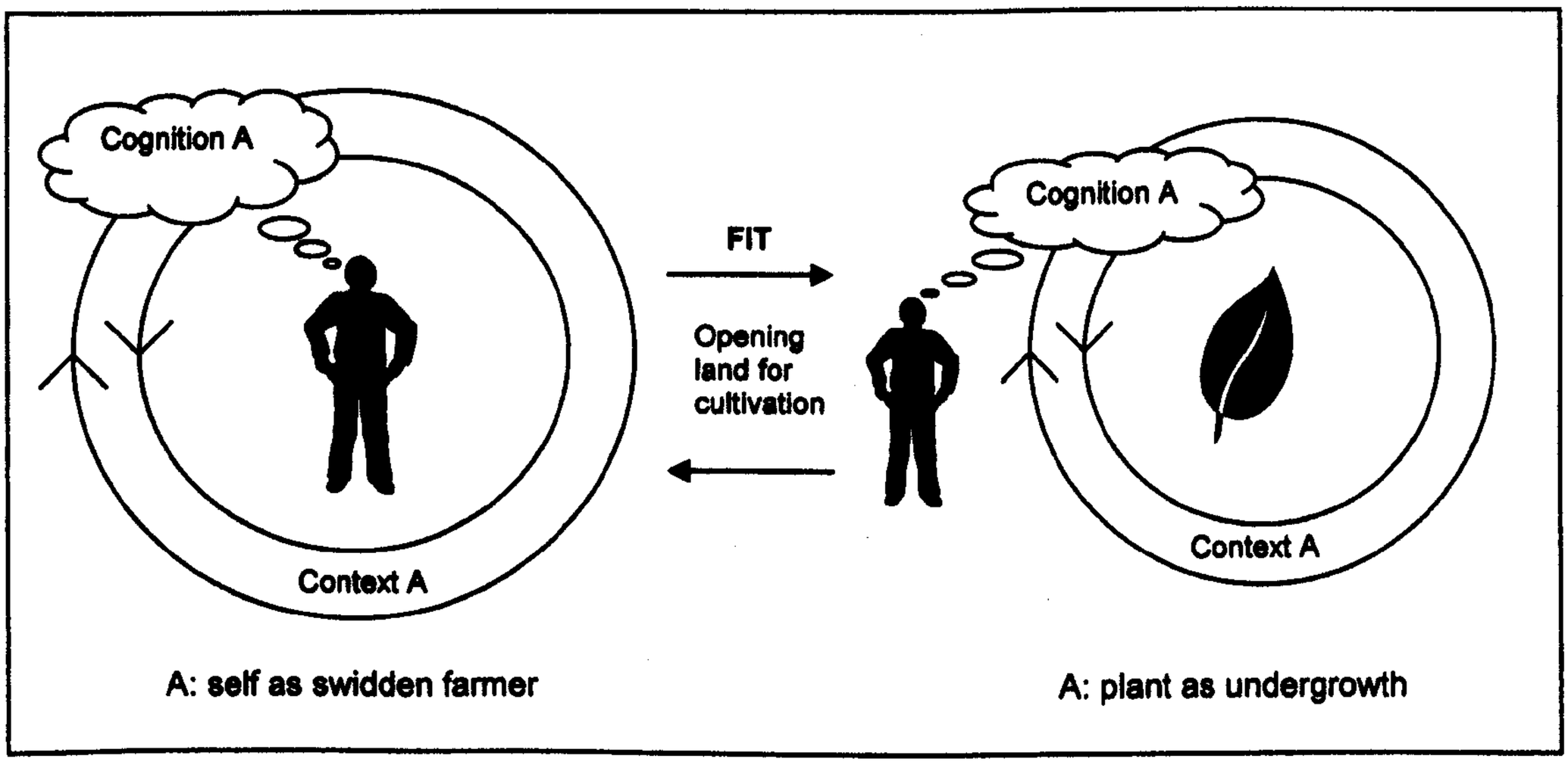

Figure 1.2.5. Swidden farmer sees plant as part of undergrowth to be opened up for cultivation

Historical developments peculiar to villages around Kinabalu (see chapter two, section six) have introduced two new elements to the area: a growing conservationist agenda coupled with an equally profitable tourist market. This is how the farmer comes to learn about the tourism value of a *Rafflesia*, which, for him, may well be a new way of conceptualising the value of the *Rafflesia* (see Figure 1.2.6). How does he internalise this information? Shall he continue with his original concept of the *Rafflesia* as simply a big smelly red bit of undergrowth and proceed to open his

land for cultivation? Or shall he, for starters, entertain the proposal that this big red smelly flower could very well be a profitable, and therefore *precious*, tourist attraction?

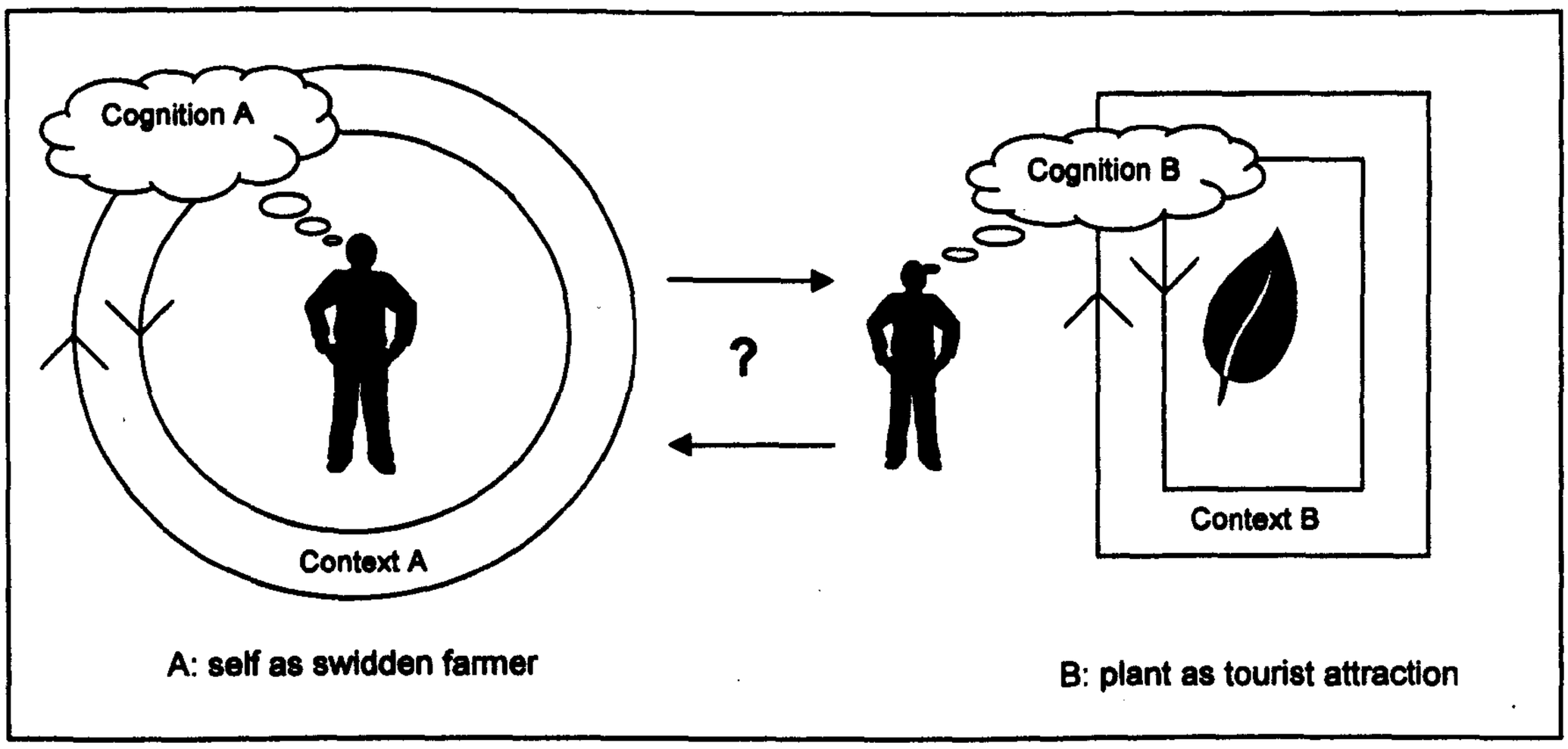

Figure 1.2.6. Swidden farmer learns that the plant can be a tourist attraction

According to the *principle of fit*, whichever scenario best fits the circumstances of his normative reality will be the scenario where the concept is most viable. Thus, if his *Rafflesia* does indeed attract busloads of tourists and the farmer earns a lot of money, then the concept of the plant as a tourist attraction will become viable knowledge to the farmer - the reality of his situation has proven the *Rafflesia*-tourism concept to be true (see Figure 1.2.7). This provides motivation for the enthusiastic farmer to accept this new plant conceptualisation and build upon this newfound knowledge that will, perhaps, serve to reinforce a new self-concept of himself as a tourism advocate. On the other hand, just because a Dusun farmer may well learn about, and come to see, the *Rafflesia* as a tourist attraction, this does not ensure that the farmer will immediately convert to being a tourism advocate. The farmer will have to weigh these acquired concepts and knowledge against other alternatives, and if the farmer realises his *Rafflesia* site is in a remote and inaccessible location, then he may well opt to reject the conceptualisation of *Rafflesias* as tourist attractions in this particular context. In this way, we can see how "perception and reasoning are very closely interrelated" (Carey, 1996 pg. 188; also Sperber *et al.*, 1995).

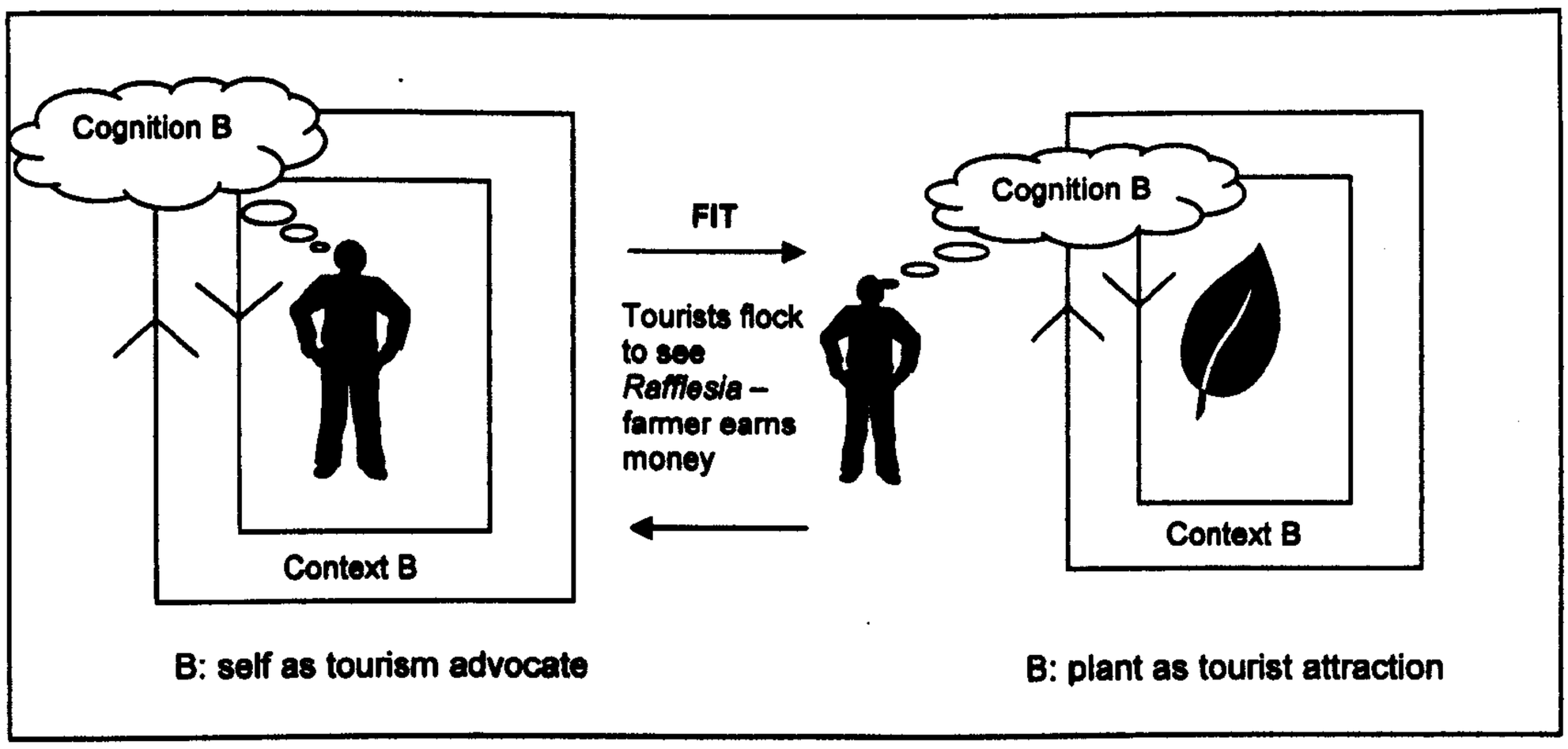

Figure 1.2.7. Farmer sees himself as a tourism advocate

If however, the farmer does convert to tourism but no one comes to see his *Rafflesia* and he earns no money then he would easily be convinced that *Rafflesias* are not viable tourist attractions and return to his original perception of the *Rafflesia* as undergrowth and proceed to open the land for cultivation. In the latter case, the *Rafflesia*-tourism concept does not fit with the outcomes in the farmer's normative reality – this concept is therefore not viable, and the farmer has little motivation to seek out any new knowledge about a *Rafflesia*-tourism concept. We could also have crusader-farmer who persists in promoting his belief in the *Rafflesia*-tourism concept such that he produces promotional pamphlets with maps of how to find his farm, markets tour packages to tour operators, sticks up signboards and offers discount rates[18]. If he succeeds, and tourists flock to his *Rafflesia*, then he would have caused his normative reality to fit with his concept. If he fails yet again, then perhaps he would be inclined to reconsider the viability of his *Rafflesia*-tourism concept[19]. Marques *et al.* (1998; pg. 128) argue, "Lack of normative fit would lead perceivers to switch to more adequate categorisation criteria... [that] more effectively account for the judgemental situation".

The *principle of fit* argument, therefore, provides the precondition that the accumulation of knowledge as a whole is context-bound to the outcomes found in reality, in pretty much the same way my informants tell me how the traditional rice varieties they are planting in Kiau is a result of repeated experimentation and observation over generations and generations of their swiddening predecessors. In chapters two and three I explore the boundaries of Kiau Dusun normative reality by discussing a number of historical developments that link the community to the wider framework of society, Sabahan statehood and the Malaysian nation. Just as Sopinggi

[18] This has happened in the *Rafflesia* conservation project around Kinabalu.
[19] This has happened too.

discovered that his reliance on the tonic would change over time, so too do different segments of the community experience overlapping waves of change in their normative reality that both stimulate and inhibit their reliance on a variety of plant resources. My research shows how both the way plants are conceptualised (*domain of thought*) and the self-concept (*eye of the beholder*) are bound to the *principle of fit* because, after much experimentation and observation, the eventuating concepts that best fit with normative reality turn out to be the concepts that are most viable (see Figure 1.2.8).

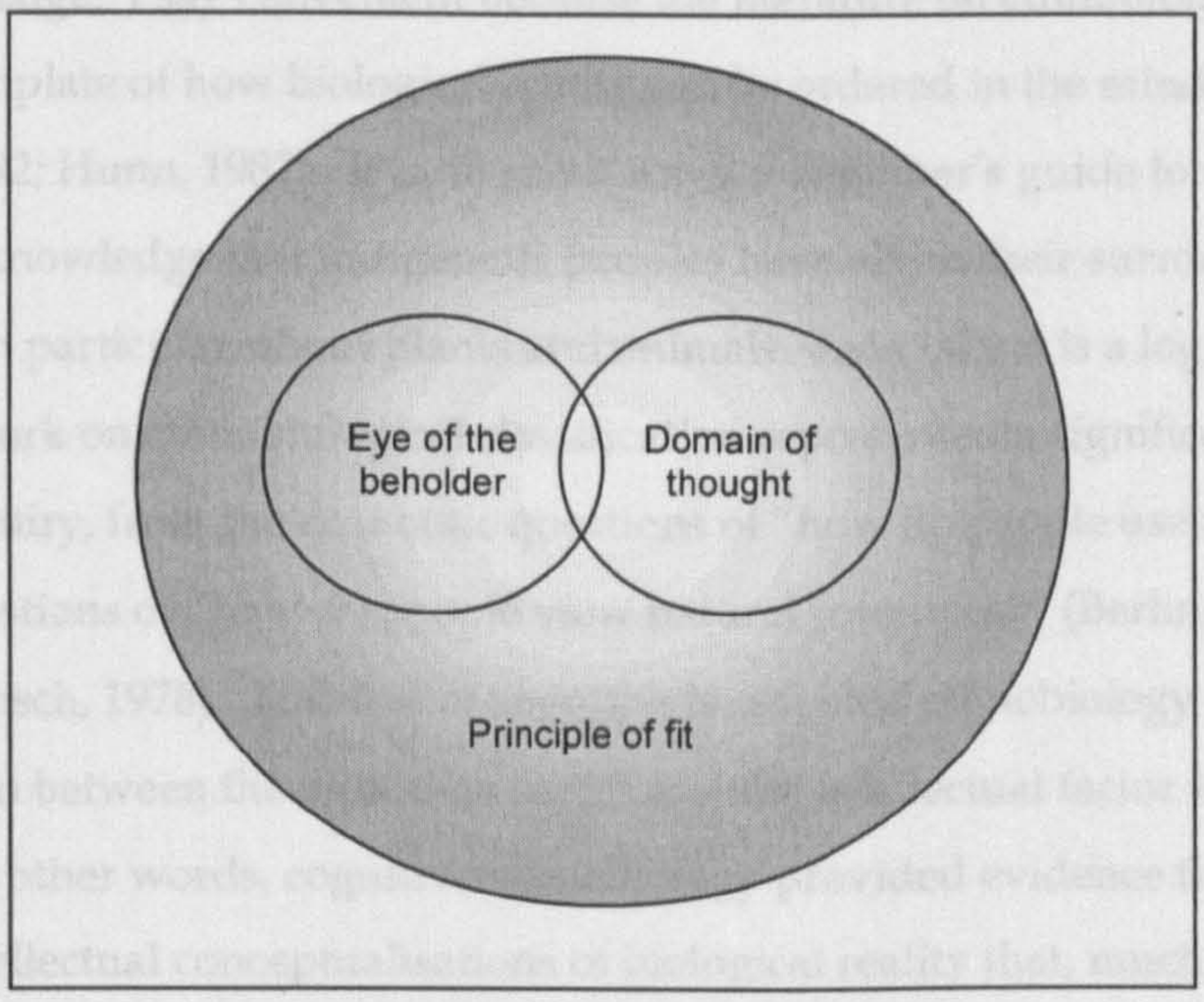

Figure 1.2.8. The context-bound reality of knowledge

Using the *principle of fit*, *domain of thought*, and *eye of the beholder* arguments, my research explores how Kiau Dusun plant knowledge fits with their "social place" (Turner and Oakes, 1997 pg. 365) in Kiau Dusun normative reality. And conversely, I ask how will changing trends in Kiau Dusun reality affect the future viability of the way they conceptualise plants and therefore, the future of the local habitats that sustain plant life?

SECTION THREE: CONTENT

1.3.1. Stuff of the mind

It is generally accepted that traditional or nonliterate societies possess intellectual systems for comprehending reality, whether it is social, cultural or biological reality (Atran, 1996; Berlin, 1992; Ellen, 1993; Ingold, 2000). In the preceding section, I have provided a summary of how cognitive processes structure the perception of reality, and how reality in turn, affects cognitive processing. This section explores the nature of the stuff that is being processed, specifically, the plant domain of thought. As Berlin rightly states, "It is hardly news that primitive peoples have

elaborated exotic ways of classifying their relatives or their supernatural beings. After all, these are quintessential social and cultural domains, subject to the unique imprint of each individual human group. To find "simple savages" controlling an extensive body of knowledge akin to the scientific fields of botany and zoology, however, is truly remarkable" (Berlin, 1992 pg. 7).

1.3.2. Conceptualising biological reality

Ethnobiological classification is a convenient, and logical, starting point for a discussion on Kiau Dusun plant knowledge. I say convenient because the literature on ethnobiological classification provides a basic template of how biological reality can be ordered in the minds of indigenous societies (Berlin, 1992; Hunn, 1982). It is, in some ways, a beginner's guide to understanding the vast and elaborate knowledge that indigenous peoples have about their surrounding environment, and in particular, about plants and animals. I also say it is a logical starting point because the early work on ethnobiological classification represented a significant leap in ethnobiological enquiry, from the economic questions of "how do people use natural resources?" to the cognitive questions of "how do people view natural resources?" (Berlin, 1992; Conklin, 1954; Ellen, 1996; Rosch, 1978). This line of cognitively oriented ethnobiology made an attempt to draw a distinction between the utilitarian factor and the intellectual factor in the human-nature interface. In other words, cognitive ethnobiology provided evidence that indigenous peoples possess intellectual conceptualisations of biological reality that, much like Western biology, are ordered in a rational and logical way (Berlin, 1992; Bulmer, 1974; Conklin, 1954; Hays, 1979). This line of enquiry argues that indigenous peoples are, in essence, intellectual beings who control an extensive body of knowledge about the natural world, which has been transmitted and maintained throughout generations, over and above the day-to-day practicalities of using these natural resources.

Thus much in the same way that modern botanists conceptualise the natural world, so too, do indigenous peoples have a way of conceptualising relationships between plants. Often termed *naïve scientists*, we find the Kiau Dusun, much like other traditional societies that have been studied, making contingent and causal relationships between the plants in their local habitat. It is how they "discern" the reality of the plant world (Berlin, 1996 pg. 8). In other words, the Kiau Dusun have a type of conceptual module for thinking about the plant world (Atran, 1996; also Carey, 1996). This Kiau Dusun conceptual module for plants is what Atran (1996, pg. 217) refers to as a cogent and "distinct domain of causal schema", or what I would call, Kiau Dusun plant knowledge. I am, however, inclined to draw the defining boundaries far looser than Atran's terminology may permit. As I discussed earlier, plant knowledge encompasses a variety of environments, where a cognitive environment such as that implicated in Atran's argument is merely one out of many other environments of social, cultural, and biological natures.

How this ethnobiological knowledge came into being, or in other words, the larger ontological enquiry, is less of a concern to this dissertation (for more see Atran, 1996). As a preface however, Berlin (1992) provides an argument that is convincing in its simplicity, in that the two poles of the human and nature interface are essentially constrained by the same principles. Human beings everywhere are constrained by the same cognitive principles for conceptualising reality. Berlin (1992 pg. 8) argues that conceptualisations of cultural and social reality are inherently complex because they are based on cultural and social "construction[s] of human experience", which are themselves highly variable, and thus are open to a multitude of interpretations. Rather crudely, it is a teleological trap of conceptualising a reality of our own making while we are making it. Conceptualisations of the natural world, however, are based on biological reality. It is a biological order that is "out there" and present in nature. It operates along basic biological and ecological principles that govern all nonhuman life on the planet earth. When human beings try to understand the natural world, they are therefore constrained by the principles of this biological reality (also known, in this dissertation, as the *principle of fit*). Berlin further argues that conceptualisations of biological reality by all kinds of peoples will inevitably produce overarching similarities because it is a product of a universal cognitive process for conceptualising a biological reality that, in essence, is constant all over the world.

This is however easily understood as an oversimplification of how we conceptualise plants for two reasons: First that biological reality is conceptualised independently of, and is not subject to, normative reality. Our preceding discussion on the mechanisms of cognitive processes suggests, "there is no evidence for physical reality testing in isolation from social reality testing. The individual always acts as a member of a group, society or culture, applying established norms even when physically alone, interpreting the physical world in light of how similar others in the same situation would be expected to respond, and achieving subjective validity through perceived or assumed agreement of others" (Turner and Oakes, 1997 pg. 359; also Ellen, 1993). The cognition-context interface, as I have argued, is not simply the process of a uniform and unadulterated human cognitive process that comprehends a uniform and unadulterated biological reality. The relationship between the farmer and the *Rafflesia* is a product of negotiations between matching attributes of his self-concept with attributes of how he conceptualises the plant and fitting the combination of both concepts with his normative reality. Conceptualising biological reality does not occur in some kind of contextual vacuum, rather is embedded in the multiple-feedback loop of cognitive processing, which, outside of an orchestrated setting, is by no means unilinear or unidirectional. In terms of human cognitive processing, there is no version of uniform and unadulterated biological reality that can exist in isolation from other aspects of normative reality (social, political, ecological or otherwise). In a

sense, the biological reality that is "out there" in nature can be accessed, accumulated and refined in so far as normative reality permits it, in the same way knowledge of certain medicinal plants is becoming increasingly fuzzy ever since the species involved have disappeared from the local habitat[20].

The second problematic issue is that biological reality is conceptualised on the basis of morphological features. Berlin (1992) makes it clear that his argument gives primacy to defining how plants are conceptualised according to sets of sufficient morphological features. This is potentially true if I were to strip my informants of their history, cues to their self-concept, and leaving only cues to the morphological features of the plant[21]. I question very much whether the Kiau Dusun utilise this "chunnel vision" to judge plants in this way – whether these morphological features "out there" represent the basic and defining criteria that the Kiau Dusun choose to rely on in formulating their conceptualisation of plants. I therefore am exploring Kiau Dusun plant knowledge as a polythetic conceptualisation of biological reality in its broadest sense, whereby polythetism refers to conceptualisations that are characterised on the basis of different sets of criteria (Hunn, 1982). I contend that Kiau Dusun plant conceptualisations, and therefore their plant knowledge, have a basis in all kinds of aspects of their normative reality, whereby these knowledge structures are flexible, overlapping and mutually inclusive as and when is most effective to satisfy present situational needs.

1.3.3. Ethnobiological classification

My first premise in studying Kiau Dusun plant knowledge is the following assumption: that the Kiau Dusun have a systematised way of conceptualising the plant world, over and above the practicality of using plants in daily life. This intellectual vs. practical approach to ethnobiology is an important distinction, which I shall return to later.

In a comparative analysis of the literature on folk biology, Berlin (1992) proposed twelve general principles of ethnobiological classification (see Box 1.3.1.). It is important to note at this stage that I am using Berlin's 1992 work to represent his own and his colleagues previous publications (Berlin, 1978; Berlin *et al.*, 1973; Rosch, 1978). I however do not view the 1992 general principles as having satisfactorily resolved the reservations of his critics (Brown, 1984; Ellen, 1993; Hunn, 1982), nor do I feel he has satisfactorily explored the alternative possibilities found in the work of his colleagues (Rosch, 1978), especially possibilities that present arguments contrary to his own position.

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[20] As a result of overharvesting and unsustainable land use practices.

[21] Even in a situation like this I would speculate that only a selection of informants who have the skill to discern morphological features would be able to formulate plant conceptualisations (and categories) on the basis of these morphological features – it is a skill that is constrained by people's ability to acquire it by virtue of their circumstances in normative reality.

To return to a review of his contemporary analysis, Berlin (1992) draws the distinction between categorisation, that is, the intellectual conceptualisation of plants and animals, and nomenclature, which is the linguistic appreciation of plant and animal names (Berlin, 1992). These general principles are grounded in a monothetic explanation, whereby the morphological and behavioural characteristics of plants and animals are the defining and sufficient characteristics that determine how plants and animals are conceptualised (see also Hunn, 1982). This explanation, as I have said, is nominally useful but largely inadequate.

Box 1.3.1. General Principles of Ethnobiological Classification

Categorisation

1. In ethnobiological systems of classification, conceptual recognition will be given to a subset of the existing flora and fauna. This subset will be comprised of the biologically most distinctive (hence, salient) species of the local habitat.
2. Ethnobiological systems of classification are based primarily on the affinities that humans observe among the taxa themselves, quite independent of the actual or potential cultural significance of these taxa.
3. Ethnobiological systems of classification are organised conceptually into a shallow hierarchic structure.
4. Recognised taxa will be distributed among from four to six mutually exclusive ethnobiological ranks, with taxa of each rank sharing similar degrees of internal variation and separated from each other by comparably sized perceptual gaps. The six universal ranks are the kingdom, life form, intermediate, generic, specific, and varietal. There is some evidence that foraging societies have poorly developed, or lack entirely, taxa of specific rank. No foraging society will exhibit taxa of varietal rank.
5. Across systems of ethnobiological classification, taxa of each rank show marked similarities as to their relative numbers and biological ranges.
   a. Taxa of generic rank are the most numerous in every system, with rare exceptions number no more than five hundred classes in each kingdom, are largely monotypic (roughly 80 percent in typical system), and, with notable exceptions, are included in taxa of life form rank.
   b. Taxa of life form rank are few in number, probably no more than ten or fifteen, are broadly polytypic, and include among them the majority of taxa of lesser rank. Substantively, life form taxa designate a small number of morphotypes of plants and animals that share obvious gross patterns of stem habit and bodily form.
   c. Taxa of intermediate rank generally group small numbers of generic taxa on the basis of their perceptual affinities in overall morphology (and behaviour). Intermediate taxa are included in taxa of life form rank.
   d. Specific taxa subdivide generic taxa but are fewer in absolute number. Folk varietals are rare; when they occur, they subdivide folk species. Unlike taxa of superordinate rank, a major portion of subgeneric taxa in ethnobotanical systems of classification is recognised primarily as a result of cultural considerations, in that such taxa represent domesticated or otherwise economically important species.
   e. The taxon marking the rank of kingdom in ethnobotanical as well as ethnozoological systems of classification is comprised of a single member.
6. Ethnobiological taxa of generic and specific rank exhibit an internal structure in which some members are thought of as prototypical of the taxon while others are seen as less typical of the category.
7. A substantial majority of ethnobiological taxa will correspond closely in content with taxa recognised independently by Western botany and zoology, with the highest degree of correspondence occurring with taxa of generic rank. Taxa of intermediate rank often correspond to portions of recognised biological families. Taxa of life form and subgeneric rank exhibit the lowest correspondence with recognised biological taxa.

cont...

Nomenclature

1. Taxa of the ranks of kingdom and intermediate are generally not named. There is growing evidence that some covert life-form taxa may also be found. When such taxa are labelled, they often show polysemous relations with taxa of subordinate rank.
2. Names for plants and animals exhibit a lexical structure of one or two universal lexical types that can be called primary and secondary plant and animal names. These types can be recognised by recourse to linguistic, semantic, and taxonomic criteria. Primary names are of three subtypes: simple (e.g. fish), productive (e.g. catfish), and unproductive (e.g. silverfish). Secondary names (e.g. red maple, silver maple), with generally specifiable exceptions, occur only in contrast sets whose members share a constituent that refers to the taxon that immediately includes them (e.g. maple).
3. A specifiable relationship can be observed between the names of taxa and their rank. Life-form and generic taxa are labelled by primary names; subgeneric taxa are labelled, in general, with secondary terms.
4. There are two well-understood conditions under which subgeneric taxa may be labelled by primary names, although these two conditions do not account for all of the empirically observed data. The first condition occurs when the name of the prototypical subgeneric is polysemous with its superordinate generic. Disambiguation of polysemy is accomplished by the optional occurrence of a modifier glossed as "genuine" or "ideal type". The second condition occurs when non-prototypical subgenerics refer to subgeneric taxa of great cultural importance.
5. Ethnobiological nomenclature is semantically active in that the linguistic constituents of plant and animal names often metaphorically allude to morphological, behavioural, or ecological features that are non-arbitrarily associated with their biological referents.

Source: Berlin (1992, pg. 33-34)

1.3.4. Categorisation - is biology the answer?

Principle 1 states that traditional societies do not have conceptualisations for all plants, just the plants that are more distinctive, or salient. Berlin (1992 pg. 21) states, "traditional societies residing in a local habitat exhibit a system of ethnobiological classification for... the most salient plant and animal species in that local habitat, where salience can be understood as a function of biological distinctiveness". The problem is as follows: according to Berlin, the main organising principle for categorisation is the morphological and behavioural characteristics of plants and animals. Certainly, the Kiau Dusun system of categorisation exhibits such trends where plants can be categorised based, commonly in this respect, on stem habit characteristics. Categorisation on this basis however, does not immediately imply that a salient plant conceptualisation is, in absolute terms, "a function of biological distinctiveness". It simply implies that a plant *can be* seen in terms of its morphological properties; in the same way the Kiau Dusun certainly do conceptualise *daing* (*Piper* sp.) as a kind of *wakau* (climber). This however does not mean that the *daing* conceptualisation is salient to the Kiau Dusun only because it is a kind of *wakau*. The Kiau Dusun do not, as Principle 1 states, have conceptualisations of all kinds of *wakau*. They have conceptualisations of a subset of *wakau*. What is it that makes this subset of *wakau* so different

that they are recognised by the Dusun, whereas other kinds of *wakau* are not? Biological distinctiveness alone is an inadequate explanation for this salience effect; after all, these all share the morphological properties of being types of *wakau*. Rather, the *daing* is distinctive from all other *wakau* because the *daing* is an important plant for medicinal uses, the smoking kit, and pepper (see also Guntavid, 1984). Much like my Dusun *Rafflesia* farmer friend, the social and economic importance attributed to the plant motivates people to know its morphology, understand its life cycle, and therefore its biological properties are remembered to make it easier to find and manage. This would also account for the fact that the Kiau Dusun have conceptualisations for the most inconspicuous weedy species, whose salience in terms of biological distinctiveness is overshadowed by their salience in terms of social and economic importance.

Principle 2 states that plants are categorised based on perceived similarities and differences between the morphological properties of various plants. I have already concurred that the Kiau Dusun certainly can categorise plants on this basis and this morphological basis is, as stated in Principle 2, "quite independent of the actual or potential cultural significance of these taxa". However, just because the Kiau Dusun exhibit *a* system of morphological categorisation does not mean this is the *only* system of categorisation (Hunn, 1982). Furthermore, just because the Kiau Dusun are able to categorise on the basis of morphological properties does not mean this is the dominant system of categorisation. That the Kiau Dusun *can do it*, is another matter as to whether the Kiau Dusun *actually do it*. My experience with the Kiau Dusun is that they conceptualise the plant world polythetically, or with what I suppose Atran (1996, pg. 217) would call "distinct [sub-]domains of causal schema".

Principles 3 to 6 describe the properties of the taxonomic structure whereby taxa are "grouped into ever more inclusive groups to form a hierarchic (taxonomic) structure" based on the similarities or dissimilarities in plant morphology and behaviour (Berlin, 1992 pg. 22). Principle 7 asserts that this folk taxonomic structure corresponds very much with the Western scientific taxonomic structure. In other words, whether a Bulgarian botanist or Kiau Dusun farmer, at the most basic level both would be constrained to see nature in similar ways simply because, that is the fact of how nature is ordered.

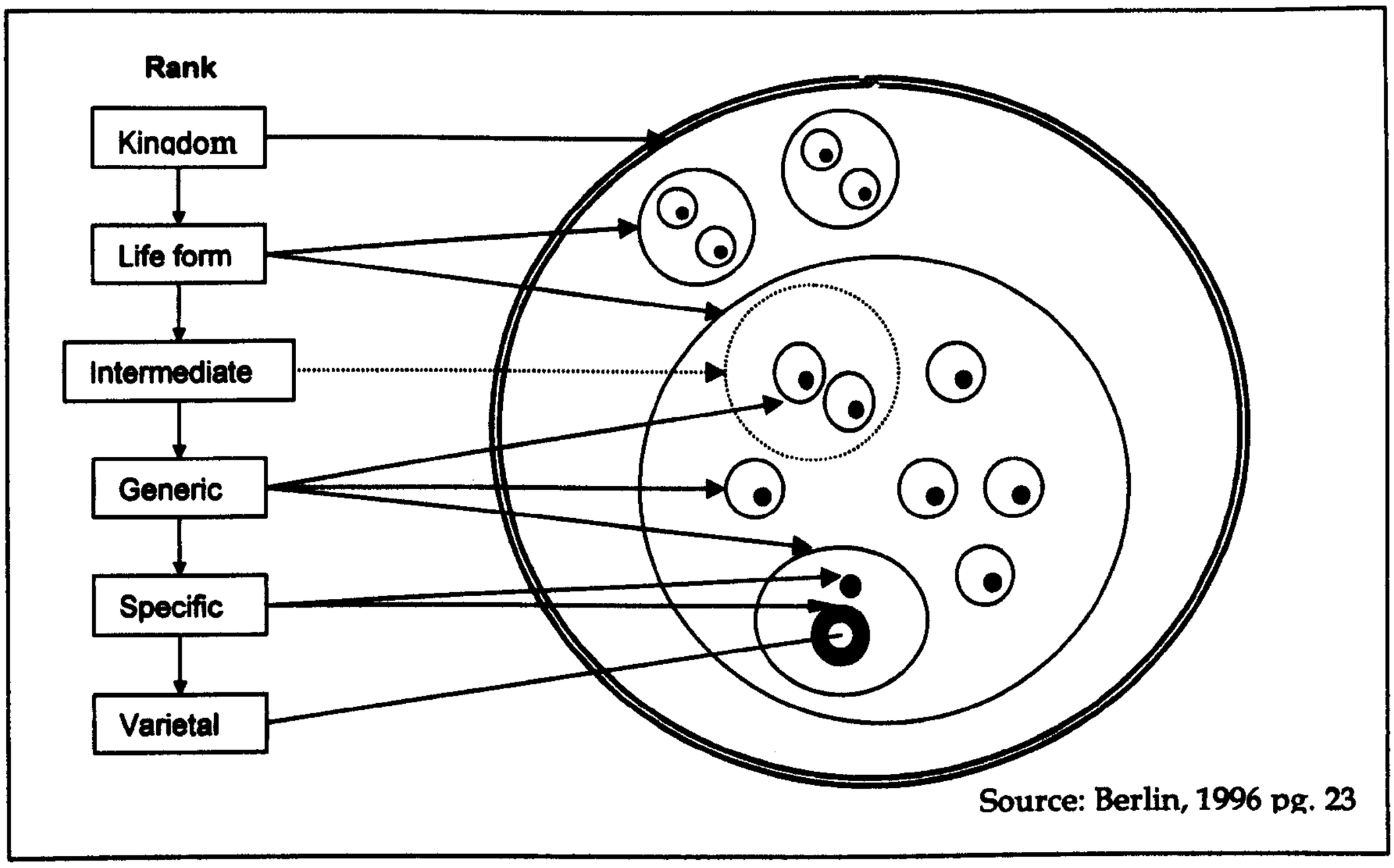

Figure 1.3.1. Schematic representation of folk taxonomic structure

My data for the Kiau Dusun reveal that, in general, they are able to conceptualise plants according to this taxonomic hierarchy. Each level, or rank, of the taxonomic hierarchy represents a degree of inclusivity that decreases as the hierarchy descends. The plant kingdom comprises a small number of life forms. Each kind of life form has a number of generic taxa, or in other words, plants that are grouped in the most basic category of ethnobiological classification. Some generic taxa can be further divided into specific taxa, and although I did not collect data for specific taxa being subdivided into varietal taxa, I contend there is the potential that the Kiau Dusun also recognise the varietal taxonomic rank (i.e. rice varieties). Taxa of the generic rank, as stated in Principle 5a, are the most numerous, and for my research, these generic taxa are the basic unit of investigation. I also found a high correspondence between Kiau Dusun generic taxa, or folk species, with the scientific species unit.

The main life forms are *kayu* (woody stems), *wakau* (climbers), and *sakot* (shrubs and herbs) (see also Bernstein, 1996). A number of informants also include *rongilut* (moss) and *kulat* (fungi) as life forms. They recognise *tuai* (rattan) as a distinct category, although some informants place *tuai* as a specific life form, while others place *tuai* at the intermediate rank under *wakau*. *Poring* (bamboo) is another case that many informants struggle with, and will finally place as a distinct life form. *Parai* (rice), my informants tell me, don't fit anywhere whatsoever. The same with *guol* (taro). *Punti* (banana), furthermore, is neither a *kayu*, *wakau* nor *sakot*, but a kind of fruit tree. In a pilesorting exercise where informants are specifically forced to think of the plant specifically on the basis of morphological properties, the common outcome is that some informants can fit

poring as a kind of *kayu*, *parai* as a kind of *sakot*, and *guol* as a kind of *sakot*. This is not an easy decision-making process, and a number of informants struggle to overcome a sense of cognitive dissonance, and are usually, not very satisfied with their end decision. Conversely, in a free-hand ranking exercise, I sit with the neatly established life form categories of *kayu*, *wakau* and *sakot*, which informants continue describing down to the relevant specific taxa with ease. Very soon however, some informants begin constructing a whole host of additional categories like *buah* (fruits) so that bananas and papayas can fit in there, or *totonomon* (food crops) so that cassava and rice can fit in there. When asked how do categories like fruits and food crops fit within the taxonomic structure, the most common answer is that these categories sit somewhere between the kingdom and life form ranks (cf. Brown, 1984).

Berlin (1992) addresses this issue by referring to such generics as unaffiliated taxa (taxa that are morphologically unusual making classification into folk-categories consistently problematic). In other words, these are taxa whose unusual characteristics diverge far away enough from the prototypical concept, making comparative fit a difficult outcome. My data (see chapter four) reveals that classification of unaffiliated taxa is, as a matter of fact, consistently coherent among a select group of informants who have a demonstrated skill in constructing mental categories based on morphological criteria. Informants who are unable, or have difficulties in describing stem habit (whether for unaffiliated or affiliated taxa) often rely on other criteria as the basis for their salient plant conceptualisation, such as use criteria, cultivation criteria, and even criteria linking similarities with the features of other plants. This pattern is consistent with the *principle of fit*: in the absence of a fit between an imposed plant conceptualisation (i.e. morphological features) and the informant's normative reality (i.e. skill in discerning morphological features), the informant will seek out other categorisation criteria that more adequately and effectively account for the stimulus plant. The resulting conceptualisation of that plant reflects how the stimulus plant fits into that person's normative reality.

Thus I suggest there are cognitive sub-domains for conceptualising the plant world. One cognitive sub-domain would be along Berlin's (1992) system of biological categorisation on the basis of morphological properties. It is a cognitive sub-domain that the Kiau Dusun can relate to, and certainly, they are able to conceive of the plant world in this way. It is also a systematic way of conceptualising plants that enables the transfer of information between traditional modes of thought (folk biology) and scientific modes of thought (Western biology). For this matter, Berlin's general principles of ethnobiological classification are a very handy tool for researchers embedded in the Western tradition to understand folk biology. It provides the basic map for accessing traditional societies' knowledge of plant and animals, as part of an "initial, necessary phase of a larger intellectual enquiry" (Berlin, 1992 pg. 13). In other words, this system of

categorisation is a means to fulfil "a larger intellectual enquiry" of the researcher and not the Dusun housewife, whereby the system of Kiau Dusun plant categorisation is the baseline for some kind of mutual understanding between the researcher (me) and the informants (the Kiau Dusun).

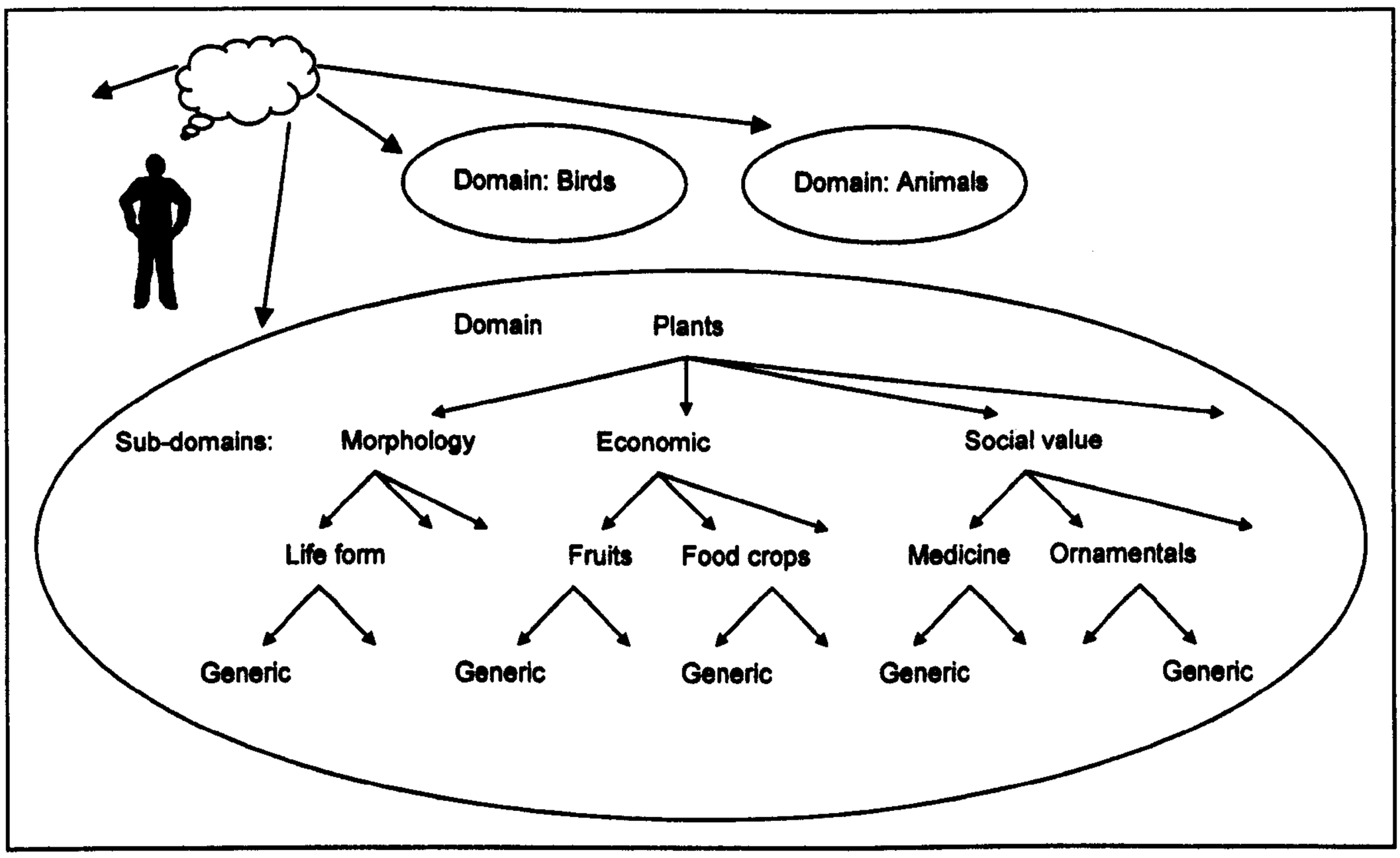

Figure 1.3.2. Polythetic representation of the Kiau Dusun plant conceptualisation

My proposition for cognitive sub-domains of thought echoes the distinction made by folk taxonomists between general purpose and special purpose taxonomies (Balée, 1994; Berlin *et al.*, 1973; Hays, 1982). In terms of plants, a general purpose taxonomy refers to classification on the basis of morphological criteria, while a special purpose taxonomy is made on the basis of other shared features such as the utilitarian criteria of fruits and food crops. Taxonomies however, are rigid specifications of interrelationships and I feel are inadequate tools for explaining indigenous plant knowledge. I have chosen to illustrate the idea of cognitive sub-domains in Figure 1.3.2. in the Escherian[22] sense of spatial relations, because it becomes immediately obvious that a taxonomical hierarchy is too flat and too rigid to be able to account for the flexibility, overlap and mutual inclusivity of plant conceptualisations. Indeed, in a revision of his work, Berlin (1992) chose to illustrate his conceptualisations by virtue of Venn diagrams (see Figure 1.3.1) as a more adequate way of accounting for normative reality. For this matter, taxonomies cannot account for how plant knowledge encompasses classification knowledge in addition to the other kinds of cross-cutting knowledge such as practical knowledge of how to use these plants, cultural

[22] M.C. Escher's famous illustrations of spatial impossibilities found on many a calendar, diary cover, and jigsaw puzzle

knowledge about symbolism, and economic knowledge about yields and market value, all of which are overlapping and mutually inclusive cognitive sub-domains.

1.3.5. Nomenclature - biology is not alone

In my view, the general principles of nomenclature are more acknowledging of a polythetic core in folk conceptualisations of plants, and provide room for cultural explanations of plant names. Berlin (1992) argues that there is a "formal linguistic structure of plant and animal names [that] is basically similar in all languages" (Berlin, 1992 pg. 26; also Brown, 1984; Chomsky, 1980). The linguistic structures of naming plants and animals exhibit a correspondence to the cognitive appreciation of the characteristics of these living things. Names therefore, are not arbitrary. On the contrary, Berlin argues that names possess an "adaptive significance", making them easier to remember, easier to use, and easier to relate between a cognitive concept and the real thing (Berlin, 1992 pg. 27). This non-arbitrary nature of naming also fulfils the need for cognitive efficiency, and thus much less cognitive effort is needed to connect a name with a plant when there is a logical relationship between the name (e.g. *kiri-kiri; Crotalaria pallida*) and the characteristic of the plant (e.g. clickety sound made when the seed pod is shaken). The fact that plant names can reflect morphological and behavioural characteristics should come as no surprise, since the identification of plants in the natural habitat is easier when using biological cues rather than non-biological cues. Additionally, since we accept that people do not know the names for *all* the plants in their local habitat, it is reasonable to accept that there is something that must drive the cognitive impetus to create and remember names of particular plants. I contend it is pragmatism that motivates the Kiau Dusun to have names for plants that are significant in their lives. Thus we find that useful plants are named plants, and I have not yet found a useful plant that does not have a name (c.f. Brown, 1984; Hunn, 1982). Conversely, we may ask what is the cognitive impetus to name plants that do not have a known use? According to the *principle of fit*, whatever criteria that best describes the plant in relation to normative reality will be the set of criteria most viable for that situation, whether morphology or mythology or something else. This also consistent with the occurrence of synonyms (particularly where one synonym has little semantic or semiotic relationship with another synonym), that people in different situations have relied on different contexts to inform their conceptualisations of the same plant.

Again, my data reveals that Kiau Dusun plant nomenclature exhibits, in general, the characteristics outlined in Berlin's (1992) rules for naming plants and animals. The plant kingdom, as stated in Principle 1, is covert, in that it does not have a Dusun name even though informants consistently recognise plants as a distinctly exclusive category in relation to animals. In my experience, informants can struggle to find an appropriate name, often debating, rather unsuccessfully, the suitability of words like *sumusuni* (things that grow from the earth) or the

polysemous term *gouton* (forest). Often, informants will borrow the Bahasa Malaysia label *tumbuh-tumbuhan* for the plant kingdom. Another example of a covert category is fungi, which commonly sits at the life form rank and is most commonly attributed the Bahasa Malaysia name of *kulat*. In this sense, Berlin's assertion, that the absence of a name does not necessarily imply the absence of a category, is strengthened. The Kiau Dusun borrow terms from Bahasa Malaysia to describe a category that is covert, or unnamed, in their own language.

Similarly for Principles 2 to 4, the Kiau Dusun exhibit the use of primary and secondary names. Thus, the word *layo* is used as a primary name for the generic taxon of gingers, while *layo aragang* (*Zingiber officinale*) is used as a secondary name for the subgeneric taxon. In the same way, *tapayas* (*Carica papaya*) is used as the primary name for the generic taxon, while the specific taxa are accorded secondary names: the male plant is named *tapayas kusai* and the female plant is named *tapayas tongondu*, using the Dusun words *kusai* (male) and *tongondu* (female). In line with Principle 4, I have found many occurrences where informants use the primary name *tapayas* to refer to the female plant. My reasoning for this cognitive need to conceptually recognise a specific rank for male and female *tapayas* plants stems from the utilitarian significance of both plants. The female provides for dietary needs, while the male plant is important for medicinal purposes against malaria and high blood pressure (see also Guntavid, 1984). Another account of utilitarian significance is the name *sampit-sampit* (literally translated to mean narrow-narrow; *Ficus deltoidea*), which is a little puzzling since nothing in its morphology or stem habit jumps out at me as being distinctively narrow. It is however, an important plant used for post-natal treatment, which is believed to narrow the birth canal after childbirth. Names can also be derived from cultural significance, such as the legend of the *mandahasi* (*Leucosyke capitellata*) told to me by Duaneh Ladsou (see Box 1.3.2.).

Box 1.3.2. Legend of the mandahasi[23]

Susuyon di Mandahasi

Maso di gulu-gulu po, haro songulun tapa' napatayan do tanak dit noontok do sowolok. Pamanau no iti tapa' diti kuminaa id pamalabangan dot mooi pomolobong. Nubasanon om nosiliu do tadat momorisi di posorili dot pamalabangan do maan do poilihan di rata naamot do mongukad luang pomolisakan. Maso diti tapa' diti do mongukad, kotigowo tomod ia'o soira nokorongou do tihad. Pamanau tomod ia'o om kabantalai dau nga' napasi no i tanak dau. Intangai dau nag' haro songguas o kayu di napatad dau muru-turu' poinghapak di kabang di tanak dau.

Ka dau, iti no i nakapasi diti tanak ku om pomungaranai no dau iri kayu diri do "Mandahasi", i mantad di boros "Minamasi". Iti no kinawaya-wayaon poingkuro kayu diti do noroitan mandahasi.

Gisom no do baino otumbayaan om kakaal po diti sompi'ion do Kadazandusun momoguno kayu diti.

Hence I concur with Ellen (1993 pg. 62) in saying that even though there are linguistic structures and systems that underlie the naming of plants, "the extent to which different types of semantic relationship[s] are employed by the speakers of a language varies". Thus I find Principle 5 to be a curious addendum in defence of Berlin's New-Structuralist approach. Even though we find plant names that *do not* "metaphorically allude to morphological, behavioural, or ecological features" (Brown, 1984), Principle 5 insists on declaring biological properties as the dominant and universal organising principle. As Hunn states, "the fact that cultural knowledge of the natural world might also be of use practically has been treated as beside the point, almost as an embarrassment... A careful examination of Berlin's own data discloses some explicit or likely practical relevance for nearly all of the Tzetal folk botanical categories he has labelled "culturally insignificant"" (Hunn, 1982 pg. 831).

1.3.6. Circles

To a large degree, my interpretation of the general principles of ethnobiological classification sees it "morphologically" as using the ends to justify the means. First, it affirms the competence of indigenous peoples as naïve scientists, in that they do indeed possess the intellectual propensity to systematically discern biological reality. As an indigenous person myself, I find little to celebrate in this belated affirmation. Second, it affirms that biological reality is "out

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[23] In the earlier days, there was a father whose daughter had just died from an ulcer. When he reached a suitable spot, the father placed the girl's body on the ground and turned away to start digging a hole nearby where his daughter will be buried. After digging for some time, the father heard a sound. When he turned around he saw that his daughter had awakened and come back to life. He saw that above her body was a tree whose water had trickled down into his daughter's mouth and given her life. For bringing his child back to life, this tree is given the name "Mandahasi" as "life giver". This is the story of how this tree came to be called mandahasi. Until today, this tree continues to be used as part of Kadazandusun beliefs.

there" according to some plan of nature that human cognition, nonliterate or otherwise, is capable of discerning in pretty much the same way. These end-product affirmations can, and have, catalysed the development of methodologies (Berlin *et al.*, 1981) that reveal to us how traditional societies can conceptualise biological reality according to morphological and behavioural properties *because* nature is ordered according to morphological and behavioural properties (Ellen, 1993; Ellen, 1996).

The tautology thickens with the assertion that "the striking similarities in both structure and content of systems of biological classification in traditional societies from many distinct parts of the world are most plausibly accounted for on the basis of human beings' inescapable and largely unconscious appreciation of the inherent structure of biological reality" (Berlin, 1992 pg. 8). The appreciation of biological reality is "inescapable" in the sense that the Kiau Dusun certainly have the ability to appreciate its inherent structure, but it is a "largely unconscious" appreciation in the sense that the Kiau Dusun are not necessarily aware that they appreciate it in this way. It is rather reminiscent of a Freudian tautology. It suggests that locked away in our heads, enmeshed within the subterfuge of cognitive operations, is a systematic filing system for storing information about biological reality sorted according to morphological and behavioural properties. How this information is elicited, in other words retrieved from storage in memory and expressed in some form, is largely a question of context. Elicitation of a Kiau Dusun system of ethnobotanical categorisation would seem, to me, to fulfil the methodological approach of my fieldwork – without any immediate bearing on the normative reality of how the Kiau Dusun actually conceptualise plants (also Morris, 1984). So, to impose this monothetic concept as the definitive, sufficient, and universal criteria for conceptualising biological reality is, if anything, a little rash. Furthermore, if it is "largely unconscious" then there can never be unequivocal proof that the Kiau Dusun, or any other traditional societies, conceptualise plants according to Berlin's General Principles of Ethnobiological Categorisation at all. We are caught within the very same multiple feedback loop of the cognition-context interface, whereby theories and methodologies are the "construction[s] of human experience" that are themselves highly variable and therefore open to a multitude of interpretations (Berlin, 1996 pg. 8; see section 1.3.2. above).

1.3.7. A contextual fit for knowledge

I have used this discussion on ethnobiological classification to tease out two parallel arguments that I highlighted in Section Two. First, Kiau Dusun plant knowledge is context-bound to normative reality and therefore plant conceptualisations are polythetic (Ellen, 1993; Hunn, 1982). We can conceptualise plants based on biological properties as well as other features such as the

utilitarian properties[24] that keep on popping up every time my informants talk about plants, despite my efforts to propagate a morphological basis for discerning plants. For the Kiau Dusun, this would include economic uses, such as food plants, medicinal plants, plants for construction purposes, and ornamental plants; or social uses such as plants used for alcohol consumption, smoking, and the management of fields and fruit trees through communal labour (also Tongkul, 2002). It also includes cultural and religious applications such as symbolic plants, plants in mythology, and plants used in rituals (Yap, 1985; also Tongkul, 2002). Kiau Dusun plant knowledge is therefore grounded in both theory and practice. In terms of the cognition-context interface, this practical essence of knowledge is what makes it the kind of knowledge that is actually transmitted, and could very well be the basis for Berlin's intellectual sub-domain to survive in Kiau Dusun memory.

The second argument is that Kiau Dusun plant knowledge is based on the *principle of fit*. Berlin is right when he states, "one is not able to look out on the landscape of organic beings and organize them into cultural categories that are, at base, inconsistent with biological reality" (Berlin, 1996 pp. 8-9). Knowledge is viable so long as it fits with reality, and this fit is based on ongoing negotiations with normative reality. In this same way, Hunn states "Berlin's concept of taxonomic rank is an awkward compromise... an attempt to fit the natural, polythetic core of a folk biological domain into the procrustean bed of a taxonomic hierarchy by interpreting this core as equivalent to a single taxonomic hierarchic rank – the genetic partition. The fit is not adequate" (Hunn, 1982 pp. 835-836).

A word of caution, however, needs to be made about applying the *principle of fit*. In a critique of Berlin, Bousfield proclaims, "epistemological chauvinism is difficult to see, especially when it is oneself who displays it" (Bousfield, 1979; pg. 195). Thus when I say that knowledge is viable so long as it fits with normative reality, I concur with Hays (1982) in cautioning that we must first agree on whose reality it is we are trying to explain.

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[24] Utilitarian properties, or what constitutes a useful plant, is defined very broadly to encompass any way a plant is attributed significance, whether biological, cultural, social, political, religious, economical (for an impressive list of uses in a Southeast Asian context, see Jansen et. al., 1993).

SECTION FOUR: COMMUNITY

1.4.1. Ground zero

The village of Kiau Nuluh, home to about 700 Dusun people, is surrounded by a rugged mountainous terrain of montane forests followed by subalpine vegetation in the higher altitudes. The village is poised along the southern spur of Mount Kinabalu (4,098 a.s.l.), which is the highest peak between the Himalayas and New Guinea (Nais, 1996). The Kiau Dusun are one of several other Dusun-speaking communities living around Mount Kinabalu, all of whom customarily regard the mountain with sacred reverence as the resting place of their dead (Regis, 1996). Indeed, the astounding beauty of the mountain combined with its immense biological richness and diversity has made Kinabalu an historical and contemporary fascination of both scientists and laymen alike (see chapters two and three). Some 70 kms to the west of Kiau Nuluh is the city of Kota Kinabalu that has about 300,000 inhabitants of various ethnic groups. Kota Kinabalu is the state capital of Sabah – formerly known as British North Borneo and renamed as Sabah upon entry into the Malaysian Federation (Tongkul, 2002). The state of Sabah occupies an area of about 73,711 sq. kms with a coastline of 1,440 kms of the South China Sea to the west, and the Sulu and Celebes Seas to the east (Lasimbang, 1996; Tongkul, 2002). Sabah, as the colonial name indicates, sits at the northern tip of Borneo, and together with the Malaysian state of Sarawak in the southwest, the kingdom of Brunei that is cradled by Sarawak, and Indonesian Kalimantan in the south, makes up the island of Borneo (also King, 1993).

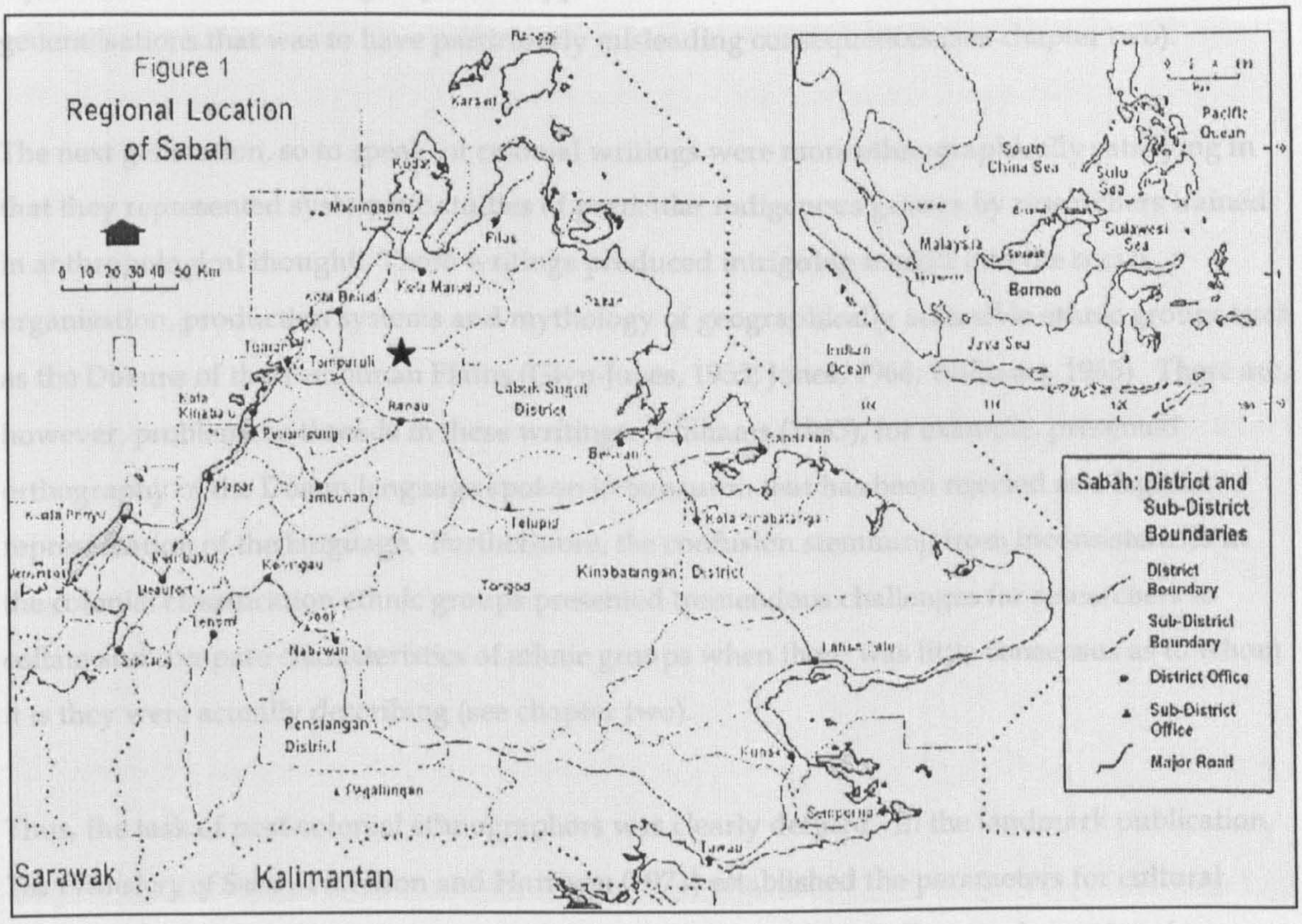

Figure 1.4.1. Map of Sabah (approximate location of Kiau Nuluh is indicated with ★)

It is reasonable to state that the direction taken in the development of ethnography on the indigenous peoples of Sabah owes some part to the confusion derived from writings of the colonial era. In the exploration of British North Borneo, a number of colonial officers, their wives and associates published manuscripts describing their encounters with, and personal studies of, a number of ethnic groups (Evans, 1970 & 1990; Keith, 2000; Tarling, 1989; Rutter, 1985). In much the same way, the exploration of Mount Kinabalu produced colourful accounts of the upland Kiau Dusuns, accounts that today serve as a record of the important role Kiau Dusun knowledge of their natural environment played in guiding these scientific expeditions (Clemens, 1915; Clemens, 1916; Gibbs, 1914; Moulton, 1915; St. John, 1986; Whitehead, 1991). Such colonial era writings often comprise intricate descriptions of village settlements, ethnic costumes, mode of subsistence, tribal warfare, religious rituals, festivals, and daily activities such as smoking and alcohol consumption. These descriptions, however, are commonly clouded by the colonial demeanour of the time where indigenous groups were seen, by some, as primitive pagan peoples who were exotic and mystical (King, 1993). There was no evidence to indicate that these descriptions had been compiled as part of a systematic study; instead they reflect general observations of an *etic* nature. Most importantly, these writings were clouded in confusion about the ethnicity of the groups being described, such that writers tended to lump a number of diverse groups under one ethnic label, or to presume that characteristics of one ethnic group was

representative of all ethnic groups who appeared to be similar - an inclination towards sweeping generalisations that was to have particularly misleading consequences (see chapter two).

The next generation, so to speak, of colonial writings were more ethnographically satisfying in that they represented systematic studies of particular indigenous groups by researchers trained in anthropological thought. These writings produced intriguing insight into the social organisation, production systems and mythology of geographically accessible ethnic groups such as the Dusuns of the Tambunan Plains (Glyn-Jones, 1955; Jones, 1966; Williams, 1965). There are, however, problematic threads in these writings. Williams (1965), for example, presented orthography of the Dusun language spoken in Sunsuron that has been rejected as a legitimate representation of the language. Furthermore, the confusion stemming from inconsistencies in the colonial classification ethnic groups presented tremendous challenges for researchers to collate and compare characteristics of ethnic groups when there was little consensus as to whom it is they were actually describing (see chapter two).

Thus, the task of post-colonial ethnographers was clearly defined. In the landmark publication, *The Prehistory of Sabah,* Harrison and Harrison (1971) established the parameters for cultural diffusion among Sabah's indigenous peoples, as part of an historically complex series of migrations over a geographically diverse and constraining terrain[25]. At the same time, scholars such as Appell (1976) and King (1989; Ave and King, 1975) were major contributors to developing an understanding of the social organisation of Sabah's indigenous groups. First, these authors agreed that the colonial classification system of ethnic groups was indeed misguided. Second, they agreed that kinship, in the Sabah case, is not the sufficient principle underlying the organisation of ethnic groups. On the contrary, social organisation is characterised by variation and diversity, such that ethnic groups have been, and continue to, experience a high degree of social mobility and contact. In the midst of all this fluidity, scholars also agree that along with kinship ties, it is also ties to locality that appear to constrain social organisation (Lingenfelter, 1990). This conclusion was expanded and strengthened when research in linguistics demonstrated how the immense variation in the numerous local dialects could be mapped roughly according to region of origin (King & King, 1984; Lingenfelter, 1990). Indeed, kinship ties, locality (or region of origin), and dialect spoken, continue to be key variables that distinguish a group's ethnicity in Sabah.

Crucially, these developments in the understanding of Sabah's indigenous peoples raised a number of intriguing theoretical issues such as investigations into social structure (Appell, 1991), religion and ritual (Phelan, 2001; Regis, 1996; Yap, 1985), land tenure (Appell, 1985; Doolittle,

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[25] Warren (1981) presents a similarly fascinating account of social migration and movement patterns in the coastal areas of eastern Sabah.

2001), and lead up to questions about the radical rates of change brought on by the recent influences of development and modernisation (Appell, 1989; Lasimbang, 1996; Pugh-Kitingan, 1989; Tongkul 2002). Of particular significance is the contribution of George and Laura Appell's work with the Rungus Dusun of Kudat. Although particularly distinct from other Dusun-speaking groups, the Rungus exemplify the principle threads found in other Dusunic groups (such as the Kiau Dusun). For instance, the Rungus are an egalitarian society comprising bilateral kin groups who continue to subsist on swidden agriculture although participation in the market economy through cash crops, wage labour, and trade is increasing. More recently, Appell (1991) reported a high emphasis on status and prestige among the Rungus that has been exacerbated by the recent economical and technological changes. Indeed, the nature, rate and impact of change among these communities continue to be pertinent issues for anthropological enquiry (Dolittle, 2001; Padoch and Peluso, 1996; Schulze and Suratman, 1999), and are key ethnographic threads to this dissertation.

To preface my discussion on Kiau in chapter three, let me introduce three things that attract me to the Kiau Dusun: First, despite being ethnically homogenous, the Kiau Dusun are a remarkably diverse community. I have found people engaged in a variety of vocations ranging from the more traditional blacksmiths and house builders to the more modern positions of self-employed tourism entrepreneurs. There is also a mix of ideas about what they would like to do in the future, with some people happy as swidden farmers while others nurture ambitions for professional qualifications. Second, there is an impressive degree of openness in the community. The Kiau Dusun, in general, are open to new ideas such as tourism and conservation as well as ideas about rekindling older traditions such as traditional dress and music. Third, and perhaps more rooted in my own personal amusement, is how much they love to drink. Rice wine is the staple drink of many occasions, and its everyday consumption has intriguing, and amusing, consequences for community integration (also Dove, 1988).

It is a pity that Kiau Dusun knowledge of the natural world, especially plant knowledge, has never before been systematically studied, especially in light of the role they played as field guides to early scientific expeditions (see chapter three). It is also somewhat frustrating that much of the research on indigenous plant knowledge in Sabah has been unable to expand beyond the meagre compilation of plant inventories (Ahmad, 2000; Guntavid, 1984; Lee & Gibot; 1986). A much wider survey of indigenous systems in Sabah by Tongkul (2002) provides some insight, whereby plant knowledge is a crucial element found in all of the belief, social, cultural, educational, health, political and administrative, judicial, economic, resource management, and agricultural systems of the Kadazandusun communities in Sabah. My own fieldwork with the Kiau Dusun concurs with Tongkul's assertion that plant knowledge is widely applied in various

aspects of community life, which makes it, as a general rule, enacted rather than declarative knowledge (also Ellen, 1993; Hunn, 1982). Tongkul (2002, pg. 26) states, "Knowledge may be transmitted through a process of apprenticeship, the practice of the oral tradition, direct observation and instruction; and through dreams, natural talents or divine gifts". This is a crucial point in my research: even though people in Kiau possess a wealth of plant knowledge, they are not necessarily putting this knowledge to practice as regularly as I had anticipated. Knowledge of some medicinal plants, for example, represents largely remembered and, therefore, theoretical knowledge rather than knowledge that is being applied, practiced and transmitted in their lives today. It is an ongoing process: the contemporary Kiau Dusun context is changing, as I presume realities continue to do, and therefore their ability to "recall, dissect and combine [conceptualisations of plants] according to changing exterior social and environmental stimuli and interior reflection" changes in tune (Ellen, 1993 pg. 148).

1.4.2. Naïve savage or native scientist: some research objectives

This chapter has laid the theoretical foundation for the structures and systems whereby plant knowledge, and more specifically the knowledge of plant names, life forms, and uses, is cognitively processed - a key example to this being the way people conceptualise plants. That these structures and systems exist is well and good, but the flavour of plant knowledge rests in the *processes* of how, when and why, such structures are implemented (Ellen, 1993). I have proposed three arguments that constrain the process of implementing these structures and systems, or in other words, the process of acquiring and applying plant knowledge: The *domain of thought* argument suggests that plants can be conceptualised in many ways, while the *eye of the beholder* argument suggests that people can see themselves in many ways. And the *principle of fit* argument suggests that conceptualisations can be selectively manipulated so that the self-concept and the way plants are conceptualised will mutually reinforce each other, particularly when selective ways of conceptualising plants justify the validity of the perceiver's self-concept. Above all, the *principle of fit* argument suggests that any knowledge expanding upon plant conceptualisations and self-concepts need to match with normative reality, whether social or biological reality, or all and any of them together (see Figure 1.4.2). Knowledge that best fits with how things turn out in reality is the most viable knowledge, therefore resulting in the most viable concepts that, in turn, seek to reproduce (and question) this reality. Because plant knowledge is a product of ongoing negotiations with reality, I therefore dedicate chapters two and three towards the exploration of the *historical processes* that have been, and continue to be, aspects of Kiau Dusun reality.

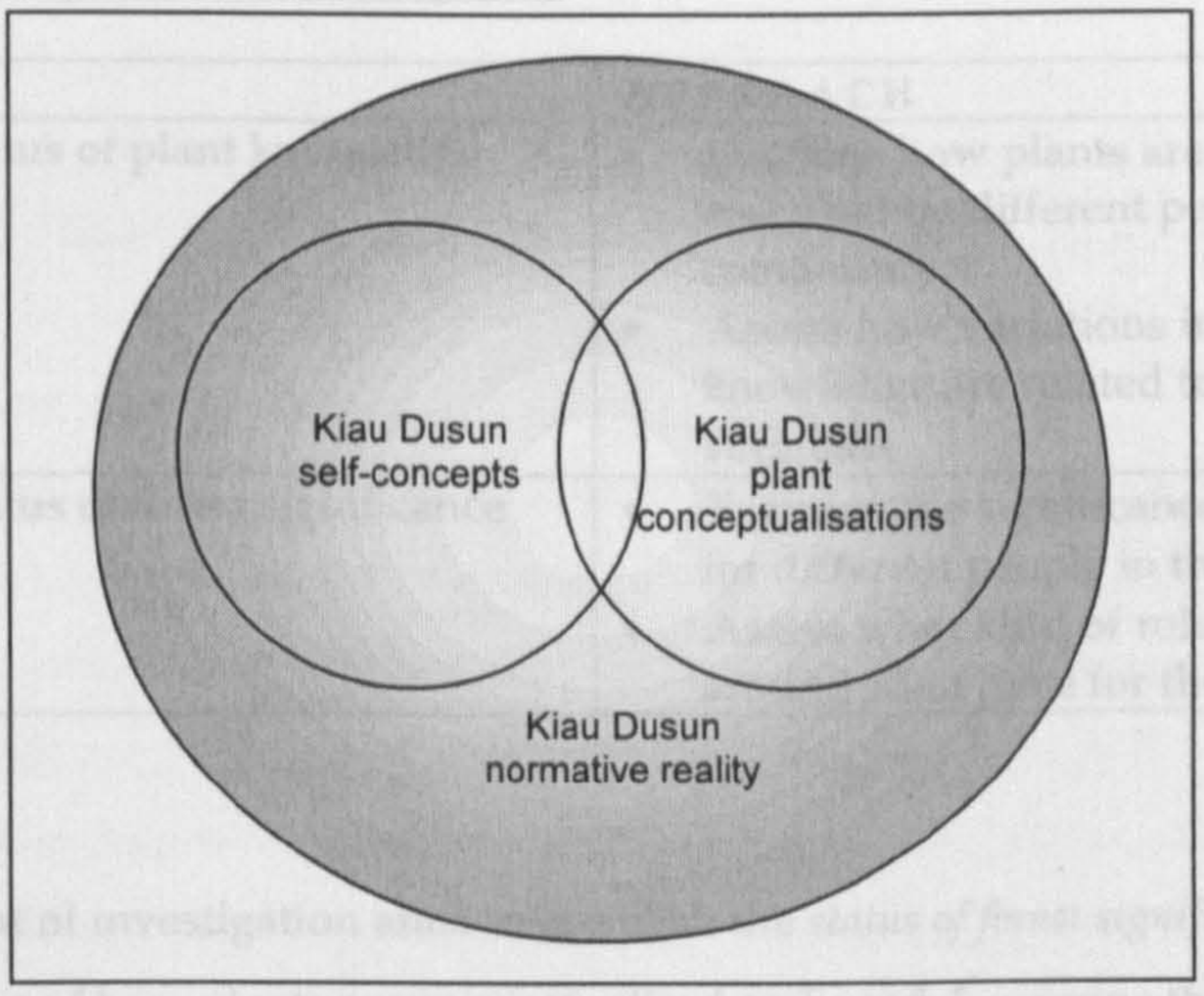

Figure 1.4.2. The context-bound reality of Kiau Dusun plant knowledge

I argue "long-term non-reversible (historical) changes" have, and will continue to, influence the way plants are conceptualised and used by the Kiau Dusun (Ellen, 1993 pg. 188). Specifically, my research shows that Kiau Dusun knowledge of plant names, life forms and uses, reflects the degree of political, cultural and linguistic contact within the wider human and natural environments, as well as reflecting changes in the social, cultural and ecological significance of plants in the community (Ellen, 1993). Kiau Dusun plant knowledge is intertwined with their history and culture (Tongkul, 2002), and is therefore dynamic in so far as their human and natural ecologies continue to change.

The purpose of my research was to identify contemporary trends in Kiau Dusun knowledge of plant names, life forms and uses, as one representative subset of the larger body of Kiau Dusun plant knowledge. One major trend is that Kiau Dusun knowledge of plant characteristics is both theoretical and practical. What remains to be seen is the trends in putting this knowledge to use, when practices are so dynamic and practitioners themselves are so diverse. In chapter four I establish the *status of plant knowledge* by examining how plants are conceptualised and used by different groups of people in the community (see Table 1.4.1). For example, I examine how consistently different groups of people can identify and describe particular plants, or how consistently a plant is attributed a particular use. I then assess any variations in plant knowledge in relation to variations in the normative reality of the Kiau Dusun, by correlating variations in the knowledge of plant names, life forms and uses, to variations in social, cultural, economic and environmental variables.

Table 1.4.1. Major components of investigation

OBJECTIVE	APPROACH
1. Establish the status of plant knowledge	• Examine how plants are conceptualised and used by different people in the community, • Assess how variations in plant knowledge are related to contextual variables
2. Establish the status of forest significance	• Examine the significance of plant habitats for different people in the community, • Assess what kind of role/s the forests around Kiau have for the people of Kiau.

A related component of investigation aims to establish the *status of forest significance* in Kiau. Thus given the status of how plants are conceptualised and used, I examine the significance of plant habitats for different groups of people in the community. Specifically, I ask what kinds of habitats different people are relying on. I then assess what kind of role forest habitats have for different people in Kiau.

Data in chapter four, combined with qualitative data presented throughout this dissertation, reveal that the way people conceptualise and use plants in Kiau is very much related to the normative reality of the times. The contemporary range of contexts in Kiau continue to impact on the way plants are conceptualised, just as much as they impact upon the self-concept of perceivers themselves. My data suggest that people are interacting with plants in new ways such as for tourism and conservation, while plants that are becoming less and less relevant to contemporary contexts now come to represent remembered, or declarative, rather than enacted knowledge. The future of Kiau Dusun plant knowledge is, predictably, uncertain. Kiau Dusun plant knowledge will continue to discard aspects that are no longer relevant, but at the same time, it will gain fresh aspects as contexts continue to fit into place. Whether the Kiau Dusun consider these changes in plant knowledge to be a loss, or whether they feel plant knowledge under threat of being lost needs to be rekindled, is a question only they can truly answer. It is also a question that I will begin exploring in chapter five. As Hunn (1982, pg. 83) rightly states, "pragmatism is no sin".

CHAPTER TWO: DEVELOPING CHANGE

SECTION ONE: AN HISTORICAL APPROACH

2.1.1. Conceptualising change

The history of Bornean societies is typically characterised by change. Over a period spanning generations, changes have continued to weave their way through the fabric of social interactions and the constitution, and reconstitution, of local institutions. These changes, woven in history, can be as subtle as they are persistent, not unlike the sublime variations of the weather and the transformation of the earth itself. As I have argued in chapter one, I refer to change as an ongoing historical process that characterises, and therefore has been part of, the normative reality of Bornean societies for millennia (see also Padoch & Peluso, 1996).

The study of Bornean societies, however, tends to lend extensive focus on the changes that have occurred within the more recent decades. The last half of the 20th century in particular has seen sudden, swift, and diverse currents of change that have transformed the perceptions of ethnic identity, altered patterns of resource management and tenure, and spurred the movements of populations among indigenous communities in Borneo (Doolittle, 2001; King, 1989; Padoch & Peluso, 1996; Pugh-Kitingan, 1989). It has been a time when countries like Malaysia and Indonesia achieved independence and thereafter promoted a stringent adherence to the modernisation and development of their nationhood. New technology and fresh ideas are injected into a society in order to initiate progress, whereupon old regimes are discouraged and eventually disregarded. In repose, indigenous communities are confronted with what Appell (1989; pp. 11-12) terms an ethic of "economic fundamentalism", which espouses the belief that "progress, particularly economic progress, is both natural and one of the greatest goods" as "the solution to human ills and discontent" whereby "tradition is a hindrance to economic opportunity and personal growth". Critics such as Dove (1996) argue that the introduction of a new political and economic order leads to serious dysfunctional consequences - the marginalisation of indigenous social systems, disempowerment of indigenous resource management systems, and the erosion of cultural identity.

Indeed, the last few decades have been extraordinary because they heralded a staggering wave of visible, rapid, and thereby, controversial changes. Certainly, there are scholars who condemn the "hallowed, unchallenged goals" of modernisation for the devastation and destruction of indigenous knowledge systems and social institutions (Appell, 1998 pg. 272). This thesis however, does not intend to draw a judgement on the constructive or destructive nature of development. Rather, I portray development as one kind of context upon which an ongoing

process of change is enacted, whereby its intended and inadvertent consequences can be seen at varying degrees of discontent and empowerment. Furthermore, despite the magnitude of changes that have happened over the last few decades, analyses presented in this and the following chapters will show that change, in the Kiau Dusun context, cannot be attributed simply as the function of a recently imposed and imperialistic development agenda. Rather, the nature of change in Kiau is ongoing and participatory.

The first issue concerns the ongoing nature of change. Padoch and Peluso (1996, pg. 1) discount the authenticity of Borneo's "untouched forests" and the "indigenous people's ancestral ways" as an oversimplification of a deeply elaborate historical process. For a long time, socio-economic changes have been an integral characteristic of indigenous communities in Sabah. The lack of written documentation and the inability of researchers to access a body of critical thought that deal with events and processes in Sabah prior to the colonial period (Ongkili, 1981) is by no means license to declare pre-colonial Sabah as a pristine social and physical landscape. I contend that the ability to adapt to different ways of living and the high levels of social contact and mobility that characterise contemporary indigenous peoples in Sabah, in fact reflect an inherent openness to new regimes and in part, describe an historical propensity towards change. In this and the following chapters, I discuss how, in the case of the Kiau Dusun, meeting the demands of the 20th and 21st centuries represents an extension of their historical processes where recently introduced changes are absorbed as norms of an ongoing continuum - one that has recently adopted the message of statehood and modern development. In this light, I evaluate recent changes in relation to the unique historical imprint of the Kiau Dusun, whose knowledge and lifestyles are a living reflection of the continuous, and yet, ever changing politics, culture, economy, and history of their times.

The second issue concerns the participatory nature of change. Based on the Kiau Dusun case, I concur that indigenous societies in Sabah have been manipulating their environment and its microsystems, adapting to different modes of land tenure, engaging in trade, and maintaining high levels of social contact, intermarriage and migration long before the 20th century came into being (King, 1993; Padoch & Peluso, 1996). "Tradition", so to speak, is a product of ongoing and active adaptation whether to forces of change undocumented in history or to the more recent forces of modernisation and development (Hobsbawm, 1984; Loh, 1992). In this chapter, I examine the wider context of changes by starting with events from the 16th century onwards through to contemporary processes of Sabah state government legislation and policy. In chapter three, I draw a parallel between changes at the state level and changes at the local level in Kiau itself. We shall see that at both the wider and local levels, whether imposed or self-enacted,

change is above all, a participatory process. It resembles a dialogue of social and physical contact where Kiau Dusuns are as much enactors as they are reactors to change.

As I mentioned earlier, the development agenda of recent decades has been crucial in shaping the contexts within which more recent changes have unfolded. For that matter, this chapter explores the role of the recent development agenda in shaping Kiau Dusun normative reality, specifically from a wider basis of state level developments. For the Kiau Dusun, this has meant coming to terms with their social place in relation to a broader Kadazandusun society within the context of state and nation building alliances.[1] I examine transformations in cultural identity and language to show how these cultural aspects are opportunistically imbued with political motivations that are designed to empower the rural Dusun person towards fulfilling an agenda of economic development and urban modernisation. I discuss how self-government in Sabah has allowed legislation and policy to overpower the very indigenous knowledge systems and social institutions it sought to protect. This has meant that a vast rural population was resolutely ushered into a new millennium of trade and industry, a process that ultimately invalidated the land tenure systems, knowledge systems and social institutions that characterise their indigeniety (Dove, 1996). I also examine Kinabalu Park as a case study where state level changes have stimulated the absorption and internalisation of new ideas, such as conservation and tourism, in Kiau.

At the outset, I admit this sounds like a rather negative casting of the recent development agenda, and certainly, the Kiau Dusun are being governed by forces that can be seen as being beyond their control and to some extent, beyond their capacity to comprehend. I am, however, *not* arguing that development *per se* is the root cause (a negative root cause at that) and enforcer of change among the hapless and helpless indigenous people in Kiau. The point of my argument is that the Kiau Dusun are active participants in deciding how they fit within this development agenda, and conversely, how they perceive this development agenda can fit their needs.

SECTION TWO: POLITICAL HISTORY

2.2.1. A route to empowerment

Party politics is a relatively new development in Sabah (Ongkili, 1981). The introduction of self-government in 1963 was the first time that Sabah came to realise itself as a geopolitical unit. For the Kadazandusun, this was a significant period that awakened political excitement and

[1] I use the terms Dusun, Kadazan and Kadazandusun to refer to the actual groups of people. The terms "Dusun", "Kadazan" and "Kadazandusun" refer to the politicised labels used to identify these groups.

gradually built up a momentum of cultural self-awareness. The last few decades of increased socio-economic development have generated a growing population of urbanised and educated Kadazandusuns, and with them came a deep questioning about the identity and future direction of their people. To begin my discussion, I provide a brief political history of Sabah so that recent developments in the Kadazandusun community can be understood within the context of their historical development.

2.2.2. Early contact

Because the early history of Sabah is perceived as being largely undocumented, it is really quite easy to stipulate that pre-colonial peoples lived in rather undisturbed times (see Ongkili, 1981). There are, however, substantial efforts to reconstruct and describe these early times that tell us otherwise (Harrison & Harrison, 1971; Pugh-Kitingan, 1989). Harrisson and Harrisson (1971, pg. 4) state that "it is essential to appreciate that present day Sabah is the outcome of an extremely complicated set of processes, both in human times and terms, and (long before that) in the convulsions of nature which shaped the land and determined all that might and might not survive upon it". With regards to the "human times and terms", Pugh-Kitingan (1989) argues that the present-day indigenous peoples of Sabah are descendant from various migrations of Austronesian[2] peoples who settled in Sabah, dating as far back as 4000 BC, in addition to the influx of non-Austronesian[3] peoples within the last 500 years or so (also King, 1993). The role of social contact, therefore, is not so easily discounted whether in reference to interactions amongst early settlers or with their more "recent" counterparts. As a matter of fact, authenticated records of Chinese contact with Brunei date as far back as 631 AD, the earliest record being only "a few miles south of the present Sabah boundary" (Harrisson & Harrisson, 1971 pg. 25). Despite the lack of conclusive evidence, the authors acknowledge that a number of myths and folk-stories, some of which have been given currency by British colonisers, relate to an early Chinese presence in Sabah. Over the centuries, contact steadily increased between the inhabitants of Sabah and a variety of peoples by way of Brunei and the surrounding Sulu and Celebes Seas, and from as far away as the Arab, Chinese, and eventually, European communities.

From the 16th to the 19th Centuries, Sabah came under the administration of the Brunei and Sulu Sultanates (Warren, 1981). They appointed, often their own, administrators and assumed ownership over the lands and forests. During this time, indigenous communities lived as self-governing tribal societies with no overarching framework of organised government, and were quickly assumed as subjects of the Sultanates (Ongkili, 1981; Singh, 1981). People were asked to

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[2] Referring to the Austronesian ancestors of the present-day Kadazandusun, Murut, Orang Sungai and other Paitanic-speaking groups, Tidong, Lun Dayeh, Brunei Malays, Bonggi, Illanun, Suluk and Bajau communities (this is not an exhaustive list).

[3] Referring to Non-Austronesian ancestors of the present-day Chinese and Indian communities (this is not an exhaustive list).

pay taxes to the Sultanates in a situation where piracy and the slave trade were widespread (King, 1993; Lasimbang, 1996; Warren, 1981). To enable easier administration, the Sultanate of Brunei appointed someone from the village as a Native Chief to represent the interests of that community, and who also had the distasteful task of collecting the hated taxes (Phelan, 1988). Over time, all the Native Chiefs from various villages would come to jointly convene the Native Chiefs Conference, which was later formalised as the Native Court, an institution set up to preside over the *adat* (customary law) of indigenous communities. Prior to the formalisation of Native Chiefs, *adat* was a matter under the sole jurisdiction of the traditional structure of village government that was headed by a *Ketua Kampung* (village headman) in counsel with the village elders, priestesses or spiritual authorities, and the circle of warriors (Lasimbang, 1996; Phelan, 1988).

Scholars such as Lasimbang (1996) argue that the imposition of the Native Chiefs and Native Court system subjugated and overpowered the traditional structures of self-government. The situation in Kiau though, presents a counter-case, where both the Native Chief and *Ketua Kampung* collaborate with other units of authority in the village. The strong relationship between the two leaders ensures that matters of *adat* still remain an issue that can be resolved within the village, thus merging the powers of an external system of arbitration with the existing values of the community. Indeed, there are scholars such as Phelan (1988) who argue that after centuries of implementation, the position of Native Chief, once thought to be an imposition, has become widely respected as a *Ketua Adat* (head of *adat*) and absorbed into the village structure of government - even though Lasimbang is nevertheless correct in arguing that the Native Chief has, on paper at least, taken away overall authority on *adat* from the *Ketua Kampung*. The situation in Kiau has certainly been subject to controversy in a variety of occasions because, in part, the distribution of power between a Native Chief and *Ketua Kampung* is largely a product of village politics, where good (or poor) interpersonal relations between the two leaders translate into the way they conduct their duties (chapter three, section five). Much later (in 1979), a new element was introduced that further eroded the significance of the *Ketua Kampung's* role: the establishment of the *Jawatankuasa Keselamatan dan Kemajuan Kampung* (JKKK) (Village Security and Development Committee), headed by the JKKK chairman[4], to oversee the welfare of the community (Phelan, 1988). All together, the Native Chief, *Ketua Kampung*, and JKKK chairman coordinate village activities today. Of these three figures, it is usually a matter of situational context that enables one authority to overrule the other (if need be) because the practical essence of this power-sharing combination is that it is upon the leaders to tap into their respective reserves of authority to jointly resolve problems.

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[4] I have not learned of any restrictions against women taking up the post although men are the ones who most commonly occupy it.

To return to early political history, the secession of Sabah by the Sultanate of Brunei to the British North Borneo Chartered Company was finalised in 1881, which among other things, formalised the naming of the territory as North Borneo (Daily Express, 2002c). The Chartered Company operated on the basis of profiting from the extraction of North Borneo's natural resources (Singh, 1981). A skeletal colonial administration was set up with the priority of maintaining a stable and orderly government to attract investment and promote trade. By 1946 North Borneo was declared a British Crown Colony (Singh, 1981). At this point, the administration concentrated primarily on post-war reconstruction, but realising that North Borneo would soon have to be granted independence, they did not invest much effort in radical reforms. As a whole, the administration gave very little recognition to customary rights, and the legitimacy of customary practices was disregarded (Appell & Harrison, 1969; Lasimbang, 1996). New written laws, procedures, and penalties were introduced, which left very few openings for a largely illiterate indigenous population to participate in their administration and government.

2.2.3. Self-government

Resentment over British colonial imperialism translated into cautious scepticism when the proposal to integrate the Federation of Malaya, Singapore, Brunei, Sarawak, and North Borneo, to form Malaysia was unveiled in 1961 (Jones, 1966; Loh, 1992). Local leaders in North Borneo did not wish to be re-colonised, this time by Malaya. And yet, at that point in time, North Borneo did not have a single political party or local government elections (Patel, 2003). This presented an immediate political opportunity - the various indigenous groups in North Borneo needed a united leadership, and a general consensus needed to be achieved on how to safeguard the rights and interests of indigenous groups. Two leaders came to the fore: Donald Stephens, a Eurasian of British, Australian and Kadazan descent, and (later Tun) Datu Mustapha, a Suluk (Loh, 1992; Patel, 2003; Pugh-Kitingan, 1989). An Inter-Governmental Committee (IGC) was established to draft a list of conditions that would protect the rights of indigenous peoples in North Borneo. Pressure from Stephens and other Kadazan leaders produced a list called The Twenty Points that proposed the acceptable terms for North Borneo's entry in to Malaysia. These included conditions such as the freedom of religion[5], the use of English[6] as the official language, and state control over matters of land, immigration, and education (Loh, 1992). Although The Twenty Points was given some official mention, albeit in modified form, it was never formalised in legislation and thus remained purely "a gentleman's agreement", an oversight that would have long-lasting effects on the political and social development of Sabah in years to come (Lasimbang, 1996 pg.188; Loh, 1992).

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[5] In other words, not to accept Islam as the national religion, as is the case in Malaya.
[6] This was formalised as a ten year grace period where English, instead of Bahasa Malaysia, would be used as the official language.

North Borneo was renamed Sabah and declared independent on 31 August 1963, which together with twelve other states formed Malaysia on 16 September 1963. The Alliance Government, which was the founding Sabah state government, comprised three political parties: the largely Kadazan based United Pasok-Momogun Kadazan Organisation (UPKO)[7] led by Stephens, the Muslim based United Sabah National Organisation (USNO) led by Mustapha, and the Chinese based Sabah National Party (SANAP) later reorganised as Sabah Chinese Association (SCA) (Loh, 1992; Malakun, 1981; Reid, 1997). No elections were held, but with the support of the British, Stephens was installed as Sabah's first Chief Minister and Mustapha as Sabah's first Governor. With little political experience, these leaders and their parties began the era of self-government in Sabah, one that has reflected ethnic relations more than any differences in political convictions or ideology.

Patel (2003) argues, "Although Stephens represented the Kadazans, he had no political base within the community. He resided in Likas[8]. He spoke no Kadazan or Dusun." Stephens therefore campaigned for the support of the wider Kadazan community by capitalising on three things: his ownership of, and editorial status in, The Sabah Times[9] to print his speeches and raise political awareness, his personal charisma in leading The Society of Kadazans and later the Kadazan Cultural Association to stimulate and capitalise on cultural unity, and by exploiting the differences between non-Muslim groups and Muslim groups (Loh, 1992; Pugh-Kitingan, 1989). Part of securing his base in the wider community was to rally the support from Dusun groups of the interior who, after all, shared the cultural and linguistic characteristics of the Kadazans. In a tactical move, Stephens questioned the cultural wisdom of defining one's ethnicity based on the "Dusun" label that was imposed by colonisers. Peter Mojuntin an influential politician and strong supporter of Stephens, writes "nearly all educated or striving to be educated Kadazans have come to regard the word 'Dusun' as derogatory when referred to them during the colonial days" (cited in Reid 1997, pg. 127). Instead the term "Kadazan" was adopted as an umbrella term to mean "our people" and referred to all the indigenous non-Muslim groups (Malakun, 1981; Reid 1997; also Appell, 1985). Under Stephens, UPKO determined that political success hinged on the ability of the non-Muslim groups to unite under a common banner. These "Kadazans" believed that "they were the underdogs in educational and economic terms, certain to be manipulated or absorbed in any multi-racial arrangement by the dominant Chinese and Muslims respectively... that they were entitled to political primacy by their greater numbers and greater claims to indigeneity, and would achieve it if they could act in a united fashion" (Reid, 1997, pg. 128). Apparently, it was believed the increased numbers under this new "Kadazan"

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[7] Stephens had initially formed United National Kadazan Organisation (UNKO) in 1961 as a Kadazan-based political party and was the vessel used to start the Alliance Government in 1963. In 1964 (in less than a year after independence) however UNKO was reorganised as UPKO, as a result of a merger with the Dusun-based National Pasok Momogun Organisation.

[8] A suburb of the state capital Kota Kinabalu

[9] The prominent daily newspaper at the time

umbrella would secure Stephens' political majority. It was, as Patel (2003) argues, "his first political miscalculation. A thorough homework would have confirmed that the combined strength of Kadazans, Dusuns, Rungus and Muruts then was only 36.9 percent. The "Kadazans" (sic) were not in the majority as he thought".

Mustapha, on the other hand, established USNO as a Muslim-based political party that allied closely with the Malay and Muslim leaders in Federal Government – fully aware, according to Patel (2003), "that the Muslims in Sabah at the time comprised 36 percent of the total population". Unlike Stephens, Mustapha had a solid base within the Muslim community, having been a Native Chief and important figure in the Native Chiefs Conferences. Thus it came to be that the Bajaus, Suluks, and other Muslim groups gravitated towards the politics of USNO. As contingency, Mustapha opened USNO to all indigenous groups irrespective of whether they were Muslim or non-Muslim. Nevertheless, the majority of non-Muslim "Kadazans" rallied around UPKO. Ethnic affairs came to dominate the political scene, where incidentally, "the Chinese remained in the middle as kingmakers for three decades" (Patel, 2003).

2.2.4. "Kadazan" collapse

In less than two years, the Alliance Government shattered. First was the issue of nepotism, which is illustrated in the rush for timber. Before they left, the British had granted timber concessions to the leaders of UPKO and USNO as the capital basis from which to launch their political campaigns. At that time, many Chinese *towkays*[10] were in control of the timber concessions. However, once the British left, "a scramble for timber began among the politicians of all ranks and shades, including those from the SCA" (Patel, 2003). It appeared that non-"Kadazan" figures were unhappy with Stephens' preference for awarding timber concessions to "Kadazans" and UPKO supporters, on top of the preferential treatment of "Kadazans" in awarding public service jobs and government scholarships. The Chinese *towkays*, in particular, were increasingly worried that Stephens' nepotism would deprive the Chinese of their annual timber licenses. Second was the issue of Malay leaders in the nation's capital Kuala Lumpur growing increasingly concerned that UPKO's rising "Kadazan" nationalistic tactics would threaten the stability of a united Malaysia (Reid, 1997). In the political wake of Singapore's withdrawal from Malaysia, Stephens and his supporters were demanding a review of Sabah's entry-terms into Malaysia (Loh, 1992; Patel, 2003). In other words, reviewing the legal formalisation of the Twenty Points. Federal Government calculated that if Stephens were to win an election using the review of entry-terms as an election issue, they would have to deal with a complicated, volatile, and undesired process. As it was, the SCA allied with USNO, Federal

[10] Meaning "trader" although often used in the vernacular sense to mean "tycoon"

Government backed the SCA-UNSO alliance, Stephens was ousted[11], and in 1967[12] Mustapha came to power (Loh, 1992).

The Mustapha government augmented its alliance to Kuala Lumpur by propagating an ethic of national unity. In 1971, Kuala Lumpur revealed the National Culture Policy as the basis of formulating a Malaysian identity in a united Malaysia (see Box 2.2.1). Irrespective of the cultural and ethnic diversity in Sabah and Sarawak, the National Culture Policy was seen as license to use Malay culture and the Islamic religion as the basis of a national identity (Loh & Kahn, 1992; Pugh-Kitingan, 1989). In Sabah, Mustapha launched an edict of "one language, one culture and one religion" became the basis of his campaign for national identity – the "Malayness" of Malaysia (Reid, 1997 pg.130).

Box 2.2.1. The National Culture Policy (Source: Pugh-Kitingan, 1989 pg.174)

The National Culture Policy is based on three principles:

1. That the base of National Culture is the culture which is native to this region;
2. That traits and elements from other cultures, which are pertinent, may be absorbed to enrich the National Culture;
3. That Islam, as the official religion of Malaysia, would play an important role in the formulation of National Culture.

Indeed, the fear that "Kadazans" would have to "discard their own cultural identity and adopt a Malay culture" became entrenched when symbols of "Kadazan" identity were suppressed, and teaching of the Kadazan language was removed from schools (Pugh-Kitingan, 1989 pg. 174). Mustapha also imposed restrictions on the screening of Chinese movies and banned lion dance performances during Chinese festivals (Patel, 2003). Bahasa Malaysia was made the official state language in 1973, coinciding with the expiration of the ten-year grace period conceded under the Twenty Points. In line with Kuala Lumpur, Mustapha saw Islam as the basis of "true" *bumiputra* (native) status and declared Islam as the official Sabah state religion in 1973 (Reid, 1997). Non-Muslim Sabahans were encouraged to convert, with Stephens himself converting to Islam in 1971. In contrast, foreign Christian missionaries were deported from the state (Loh, 1992). Additionally, Mustapha's government made immigration relatively easy for Muslim foreigners to settle in Sabah and thus bulk up the Muslim vote in the state. In the 1970s roughly 72,000 Filipino migrants from southern Philippines (including the Sulu islands) were granted entry into

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[11] In the period between Stephens' relinquishing of the Chief Minister's post, (later Tan Sri) Peter Lo was appointed as interim Chief Minister in Sabah. One of his main tasks was to prepare Sabah for the elections in 1967.
[12] Sabah's first general elections were held in 1967, where Mustapha stepped down from his Governorship and re-entered party politics to win the elections.

Sabah (Sullivan & Regis, 1981). It was, however, a time of spirited economic growth where the Mustapha administration established a number of government agencies targeted towards rural development (Patel, 2003).

Over time, Mustapha fell-out with a Kuala Lumpur that was growing tired of his assertive authority and excessiveness. The Federal Government persuaded (later Datuk) Harris Salleh, a Muslim leader who was serving under the Mustapha administration, to form a new party called Berjaya (Malakun, 1981; Patel, 2003). Seizing the opportunity, Stephens and disgruntled Chinese leaders formed an alliance with Harris in what turned out to be a successful strategy of multi-racial politics that spurred public confidence and appealed to the politics of a wider range of ethnic groups (Loh, 1992). By then, an irritated Kuala Lumpur had requested Mustapha's resignation as Chief Minister, who subsequently handed over the post to Said Keruak, another Muslim leader. In 1976 however, Berjaya won the state elections and Stephens was installed as Sabah state Chief Minister, with Harris as Deputy. Two months later both Stephens and Peter Mojuntin, his deputy, died in a plane crash. Harris took over as Chief Minister with Dr. James Ongkili, a Kadazan academic, as Deputy Chief Minister (Reid, 1997). The Berjaya government stayed in power from 1976 to 1984, during which Harris cultivated closer ties to Kuala Lumpur, pursued the Islamisation of Sabah, and ushered in further modernisation throughout Sabah. Under Harris, the state economy boomed and consequently, the Federal Government came to play an increasingly instrumental role in the economy (Loh, 1992). Patel (2003) remarks, "During his term, Harris brought remarkable economic progress and unprecedented prosperity to the State. The older generation still remembers Berjaya rule as the golden era of Sabah. Despite its outstanding economic performance, Berjaya lost in 1985 due mainly to the same reasons that USNO lost in 1976".

2.2.5. The *bumiputra* issue

The Malays were accepted as the *definitive indigenous people* in Peninsular Malaysia , and thus Kadazans and Dusuns felt themselves to be the "true" and *definitive indigenous peoples* of Sabah. The term *bumiputra* (literally meaning sons of the soil) was invented by Malaysia as an official designation for these *definitive indigenous peoples* (Reid, 1997 pg. 129). *Bumiputras* were entitled to "special privileges" through government instituted quota systems and a slew of *bumiputra* development projects (Gudgeon, 1981; Khoo, 1992). Leaders of ethnic groups were quick to politicise the authenticity of their indigenousness as each sought to justify it's own political and cultural legitimacy as *bumiputras*. During the Mustapha era migrant Muslim Filipinos were awarded *bumiputra* status under the premise of being Suluks from the Southern Sulu Seas. *Bumiputra* socio-economic benefits awarded to political supporters strengthened political support and bought votes. By the time Berjaya came to power, many "Kadazans" felt they were being

marginalized by the growing bulk of the *bumiputra* Muslim population. "Kadazans" were further infuriated by Berjaya's acceptance of Kuala Lumpur's call for all *bumiputras* to unite under the National Culture Policy (implicitly the Malay and Muslim culture). In an attempt to placate conflict, the Berjaya government in 1980 replaced the word *bumiputra* with the Indonesian term *pribumi* to denote "all Sabah peoples of Malay stock and related groups" (Reid, 1997 pg.131; also Loh, 1992). Thus while the form changed, its substance did not. The 1980 census lumped all previously Kadazan, Dusun, Murut and other *definitive indigenous people* of Sabah under the category *pribumi* – together with the recent Muslim migrants from the Philippines and Indonesia.

2.2.6. "Kadazan" nationalism

"Kadazan" nationalism is tale-tellingly illustrated by the political history of the *Kaamatan* (harvest festival) (also Kessler, 1992). This annual festival celebrates the conclusion of the rice year with ceremonial rituals performed by *bobolian* (priestesses), and exhibitions of traditional dance, song and oratory skills. The climax is a beauty pageant held in honour of the maiden *Huminodun* (see also Pugh-Kitingan, 1989). In the Kadazan and Dusun origin myth *Hominodun* had sacrificed her life in exchange for the flourishing of agriculture, and thus the birth of rice (Reid, 1997; Yap, 1985; also Luping, 2002). The Kadazan Cultural Association (KCA), an organisation active since the 1950s, coordinated the *Kaamatan* and was also the key organisation to document and standardise "Kadazan" traditions, its language, song and dance (Malakun, 1981). It was the KCA that spurred the formation of UPKO to explore the development of a political unit for the Kadazan people. In 1960 the colonial administration declared a three-day state wide public *Kaamatan* holiday as an equivalent to Chinese New Year and the Muslim Hari Raya Aidilfitri. The *Kaamatan* rapidly became the cornerstone of "Kadazan" cultural pride and a symbol of cultural identity. It was quickly stifled under Mustapha.

With the dissolution of UPKO in 1967, there was no political party that represented "Kadazan" interests, and thus, the KCA came to be the main organisation concerned with "Kadazan" affairs (Loh, 1992). In 1976 Joseph Pairin Kitingan was elected President of the KCA (Reid, 1997). Under Kitingan, the KCA's popularity increased with the establishment of KCA branches in rural areas and an energetic devotion to the coordination of the *Kaamatan*. By 1981 the Harris government was becoming worried that rising "Kadazan" nationalism would undermine the multi-racial politics of Berjaya, and damage his attempts to build closer links with Kuala Lumpur. Pairin's refusal to turn the KCA into an umbrella organisation for all ethnic groups spurred Harris to execute a cultural *coup* by taking control of *Kaamatan* and declaring it as a "people's festival" for everyone in Sabah (Loh, 1992; Reid, 1997). The government announced that the festival would be officiated by the King of Malaysia but due to His Highness' tight

schedule the festival was shortened to one day. The ceremonial rituals performed by the *bobolian* were removed. In defiant protest, the KCA organised an autonomous *Kaamatan* in Pairin's hometown of Tambunan. This renegade festival was an unequivocal success – attended by thousands who travelled across the state (Reid, 1997). It was a remarkable expression of cultural unity among Kadazan and Dusun people, which reinforced the cultural authenticity of "Kadazandusunism", thereby granting political legitimacy to Parti Bersatu Sabah (PBS) momentum (Kessler, 1992). Pairin became the new "Kadazan" cultural hero – and in 1984 the KCA anointed him as *Huguan Siou* (paramount leader), a title originally founded for, and in honour of, Stephens. In less than a year, Pairin defeated Harris and took over as Sabah Chief Minister.

Under Pairin's leadership, his PBS government was quick to adopt multi-racial politics drawing support from Kadazans, Dusuns, Muruts, Chinese, and Muslim groups. The *Kaamatan* was reinstated as a two-day state wide public holiday, and control was returned to the KCA (Reid, 1997). The term *pribumi* was abandoned and the term *bumiputra* was restored. Non-Muslim groups were reinstated as the "true" *bumiputras* giving them better socio-economic opportunities, career development, and educational bursaries (Gudgeon, 1981). Calls were made for the "Kadazan" language to be reintroduced to schools. A jittery Kuala Lumpur was placated by the integration of PBS into the Barisan Nasional (BN) party, which is the ruling coalition of Malaysia (Crouch, 1992).

2.2.7. "Dusun" nationalism

From very early on, Stephens faced a difficult job in convincing Dusun groups to identify themselves as Kadazans. In 1961, Dusun leaders from the interior Tuaran and Keningau areas voiced their concerns about "Kadazan" imperialism. They had refused to accept Stephen's proposal that "Kadazan" be used as the official name for both Kadazan and Dusun peoples, but had been outnumbered by the more powerful voice of the educated and economically privileged Kadazans (Reid, 1997). However, by the mid-1980s the Dusuns of the interior had gained more economic power, a stronger political voice and possessed a self-aware cultural momentum of their own. Education had spread to the interior, and the vast rural population were gradually able to comprehend the changes in their government and gauge the nuances of political manoeuvring. In short, they worried that PBS and the KCA were taking "Kadazan" nationalism too far (Loh, 1992). A group of Dusuns led by Mark Koding of the United Sabah Dusun Association (USDA) voiced concern that the "Dusun" counterpart of the "Kadazan" peoples had been undermined by the political and cultural dominance of "Kadazanism". USDA demanded equal responsibility in organising the *Kaamatan*, or else they threatened, they would relive the 1982 Pairin cultural rebellion and organise a renegade rival *Kaamatan* in Koding's stronghold of

Ranau (Reid, 1997). It was apparent that "Kadazanism", and the very label "Kadazan" itself, was no longer a politically viable strategy to represent both Kadazan and Dusun peoples without undermining the unity of the two groups. After much bickering, a compromise was reached in 1989, and it was announced that the official name for the Kadazan and Dusun people would be "Kadazandusun" (Reid, 1997). The KCA was renamed the Kadazan Dusun Cultural Association (KDCA) and would continue to host the *Kaamatan* as the symbol of "Kadazandusun" cultural pride and ethnic identity.

2.2.8. The fall of "Kadazandusunism"

Pairin came to be for the "Kadazandusuns", what Mustapha was for the Muslim groups. Both these leaders "looked after the welfare of their own people and ignored the economic well-being of the rest. Both effectively used the issues related to [culture] and religion to advance their political ambitions" (Patel, 2003). The PBS government pushed for the integration of the rural "Kadazandusun" into the urban economy through various development and business schemes, improvement of infrastructure such as roads and telecommunication networks, easier access to educational scholarships, and a consistent cultural call for "Kadazandusun" unity in progress (Gudgeon, 1981). Non-"Kadazandusun" groups were hard pressed to receive such privileged treatment. At the height of its power, PBS calculated they would score a sensational landslide victory in the 1990 state elections, and spurred by this estimation they declared a withdrawal from BN in a suggestive gesture over the independence of Sabah from Malaysia[13]. Ripples from an agitated Kuala Lumpur echoed worries within PBS itself over their impetuous decision, and discontent swelled within the party. Key players abandoned Pairin, and declared their loyalty to BN. Bernard Dompok, a prominent "Kadazandusun" leader in Penampang formed the Parti Demokratik Sabah (PDS) (later renamed UPKO as a gesture of political and cultural revival), and Joseph Kurup, a prominent Murut leader, formed the Parti Bersatu Rakyat Sabah (PBRS), both under the wings of BN. "Kadazandusun" unity had shattered and splinters of people were scattered in various alliances whose incessant bickering further reduced the possibility of a united "Kadazandusun" community.

As a result of these defections, PBS lost their election majority, and by 1994, a new BN government was installed using a rotation system (Patel, 2003). To ensure the equitable representation of ethnic groups in Sabah, the government would rotate about every two years from Muslim *bumiputras*, to Chinese, and finally to non-Muslim *bumiputras*. Each major ethnic grouping therefore, would get a chance at government. In less than ten years since the rotation system was established, Sabah has had seven Chief Ministers (Patel, 2003). A simple divide and

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[13] The PBS withdrew after nominations had closed, thereby denying BN the opportunity of fielding substitute candidates for the vacant nominations. The move, although sensationalised by the emotional gesture of splitting from Malaysia, is closely linked to other developments within Federal politics at the time (Crouch, 1992).

rule tactic had been masterfully executed by Kuala Lumpur, as there would be enough discontinuity in a rotating government that any further ethnic nationalistic uprisings would be quickly quelled by the new incoming government. To strengthen the BN voting stronghold, emigration of Malays from Peninsular Malaysia was encouraged even more. As a bonus to the "Kadazandusun" community, the Federal Cabinet accorded the *Kaamatan* with due recognition as a national celebration and tourism festival in 2000 (Daily Express, 2002a). Dissatisfied and powerless to invoke any change, PBS eventually reapplied and was accepted for readmission into BN in 2001. Until today, neither PBS nor the politics of "Kadazandusunism" has regained the power of its youth. In contrast, Sabah has been successfully incorporated into the politics of the Federal Government, some thirty years after the formation of a united Federation of Malaysian states.

It was also believed that the ethnic politics of a rotating BN government ensured that socio-economic opportunities would be distributed multi-racially, albeit at two-year intervals. Patel (2003) however argues that the rotation system "has encouraged corruption and abuse of power". Indeed, allegations of nepotism and the lack of transparency in government transactions that were the haunting characteristics of Sabah administrations dating all the way back to Stephens' time, have been amplified with a rotation of ethnically aligned governments. In a shocking public revelation in 2002, Chief Minister Chong Kah Kiat disclosed the state's "massive debt burden, lop-sided deals, unfavourable privatisation deals, over-priced contracts and plundering of land and forestry resources" (Patel, 2003). With only a limited two-year lifespan, each ethnic group's desperate rush to hang on to power and sustained monetary return is further exacerbated.

2.2.10. Power to the people

Sabah has a very young history of self-government. For "Kadazandusuns" scattered in villages across Sabah, it has been, if anything, a little confusing. First the *Kaamatan* was a three-day holiday, then it was one day, and finally two. The Kadazan language was taught in schools, then it was not, only to be reintroduced again. PBS joined BN, then withdrew, and later rejoined again. From "Dusun" to "Kadazan", *bumiputra* to *pribumi*, back again and around once more, they have been thoroughly jiggled by party politics. I contend that self-government has in fact been no government at all. In its broadest sense, from Stephens to Mustapha, and Harris to Pairin, self-government in Sabah has resembled a squabble over political hegemony by capitalising on the cultural dominance of one particular ethnic group over all the others (Loh, 1992). In effect, the constant changing back and forth of government policy more reflects the opportunistic motives of political leaders, further tainted by allegations of nepotism and corruption. In a state that is hardly homogenous, self-government has been manifest as an

exercise in the conflicts of party politics more than any genuine commitment to sustainable community development.

Scholars point out that formal education has been an underlying thread in this whole process (Crouch, 1992; Loh, 1992; Pugh-Kitingan, 1989; Reid, 1997). Education has been a catalyst in spurring political and cultural awareness, first for the coastal Kadazans and much later for the interior Dusuns, giving rise to an ever-growing Kadazandusun middle class (Loh & Kahn, 1992). The enhanced ability to identify structures and comprehend processes has catapulted Kadazandusun leaders to the frontlines of development planning, in the same way literacy has enabled a reflexive discourse of their cultural substance and form. In this light, educated politicians like Stephens and Pairin have contributed immensely to a sense of self-awareness that invoked the cultural and political excitement of Kadazan and Dusun peoples across the state. Together with their contemporaries, these leaders represented a direct access to power that would enable rural development, healthcare, literacy, and cultural survival of their peoples. However, the majority of rural Kadazandusuns, such as the Kiau Dusun, do not yet have the luxury of formal education embodied by their leaders and therefore are dependent on the educated elite to tell them what to do. The wide economic gap between the elite leaders and the impoverished peasantry also means that villagers are resigned to depending on their ethnic leaders to *provide* development by whichever route their politicking takes. Education has stratified the Kadazandusun community. It reinforces the political and economic imbalance by strengthening the ability of urban Kadazans to exercise opportunism at the expense of rural Dusun self-reliance. As we await the emergence of an educated class of younger Dusun generations, the impact of formal education on the political and cultural consciousness of the rural Kadazandusun community remains a speculation that certainly invokes intriguing questions for future investigation.

The politics of ethnicity however, dealt its own deathblow. Over-confident with inflated ambition, "Kadazandusunism" attacked the ubiquity of an older, more experienced, and equally ethnocentric Federal Government in Kuala Lumpur (Crouch, 1992; Khoo, 1992; Loh, 1992). "Kadazandusunism" (and therefore their preferential treatment) was quashed, and access to power was redistributed along the very same ethnic lines used by the UPKO-USNO-SANAP alliance. We return, therefore, to where we started.

SECTION THREE: THE LANGUAGE OF IDENTITY

2.3.1. Emergence

The Twenty Points, in its attempt to defend the interests of indigenous peoples in Sabah, interestingly, included the condition that English be used as the official language (Loh, 1992; Pugh-Kitingan, 1989). It was perhaps an ironic compromise between not wanting to accept Bahasa Malaysia (the Malay language), and not wanting to cause ethnic disaccord by nominating one particular indigenous language to be the official language, that English (the language of the colonial British administration) was chosen. Quite likely, it was also because the administrative and historical documents were, at the time, all in English and a smooth transition was certainly desirable. Furthermore, the majority of local leaders had been educated in Catholic missionary schools and were fluent in English. Most importantly, indigenous languages at that time were oral languages that had not yet been sufficiently transcribed in any systematic form. As history would have it, the Twenty Points itself was never transcribed to government policy, and Bahasa Malaysia came to take its place as the unifying official language of Malaysia.

The development of indigenous languages in Sabah, and in particular the Kadazandusun language, has been in part, intertwined with the politics of ethnic nationalism. The dedication of Stephens and his followers to promoting the status of the then "Kadazan" language was pursued with equal conviction by successors like Pairin and Dompok. "Dusun" leaders were equally persistent in calling for equitable representation of Dusun speakers in the "Kadazan" language, and eventually, an *official version* of *the* "Kadazandusun language" was established. Today, this merged language is perhaps the most critical vehicle by which the "Kadazandusun" identity is perpetuated and reaffirmed. Its introduction into schools, presence in the media and other publications are factors that stitch "Dusun" and "Kadazan" identities together to encourage a perception of themselves as one kind of people. The "Kadazandusun" language is, in fact, a synthesis of regional dialects that has been executed with profound linguistic integrity and great political style.

2.3.2. Understanding the language

Of the 138 languages in Malaysia, 54 languages are indigenous to Sabah (Lasimbang and Kinajil, 2000). According to Smith (1984) the indigenous languages of Sabah fall under the Austronesian superstock, under which the majority of languages are classified as Bornean stock represented in the four divisions of the Tidong language, the Paitanic, Murutic and Dusunic families. Smith tentatively enumerated ten languages classified under the Dusunic family, including what he termed the Kadazandusun language that encompassed thirteen dialects, making it the most widely spoken language in Sabah. Smith's enumeration of the Kadazandusun language however, was later significantly realigned in the light of new data, and was reclassified to

include only four dialects, which are Central Dusun, Coastal Kadazan, Sugut Kadazan and Kuala Monsok Dusun (Moody, 1984). Lasimbang and Kinajil (2000) estimated that Kadazandusun speakers would number up to 750,000 by the year 2000, making up approximately 37% of the state population.

2.3.3. The dialect range

In line with Moody's reclassification, residents of Kiau who live at the edge of the Kota Belud district would be seen as speakers of Central Dusun (recorded primarily in Kinabalu and northern Crocker Range). Villagers in Kiau call themselves speakers of Kota Belud Dusun, which they recognise to be the same variety of Dusun spoken in neighbouring villages along southwestern Kinabalu. My own experience has revealed very little acknowledgement of a systematic linguistic classification (as outlined by Smith and Moody) by the speakers themselves. Local understanding of linguistic classification is based largely on gradients of perceived spoken dissimilarities from one area to the next. They admit the Kiau variety of Dusun becomes more dissimilar the further northwest one travels towards Kudat and Kota Marudu, which are predominantly Rungus speaking areas (Appell, 1985). This dissimilarity also increases going eastwards towards Kundasang and they recognise it as a different variety once at Ranau. Here they call it Ranau Dusun, which speakers perceive as being more closely related to the Dusun spoken in the Crocker Range (also called Tambunan Dusun). Intriguingly, these local classifications correlate with Smith's (1984) original proposition of having Kota Belud Dusun and Ranau Dusun as two distinct dialects among eleven others in the Kadazandusun language family. It was only later testing by Banker and Banker (1984) that resulted in these dialects being absorbed under the umbrella of a Central Dusun dialect, and certainly presents an aspect of linguistic research that would be worth pursuing in the future. The latest revision of the Kadazandusun language family was in 1996 as a result of several in-house surveys carried out by the Summer Institute of Linguistics (Moody, 2003 pers. comm.). According to the reclassification, the Kadazandusun language family now comprises eight dialects although Central Dusun and Coastal Kadazan remain as the main dialects, and is a reclassification that has been accepted by the Kadazandusun Language Foundation (see Box 2.3.1).

Box 2.3.1. The Kadazandusun language family (Source: Summer Institute of Linguistics, 1996)

The Kadazandusun language family is made up of the following dialects:

Central Dusun
Coastal Kadazan
Kuala Monsok Dusun
Minokok
Sugut Dusun/Tinagas
Talantang (Kota Marudu)
Tambunan Dusun
Tempasuk Dusun

For our purposes however, comparisons between the Central Dusun (Dusuns of the interior) and Coastal Kadazan (Kadazans of the towns) dialects revealed a high degree of intercommunicability (Banker and Banker, 1984). The ease to which speakers from either dialect could understand each other supports the argument that Dusuns and Kadazans could very well share the same ancestry, and have certainly maintained high levels of social contact despite living in different geographical areas. However, as we have seen in the preceding section, both groups experienced political and cultural consciousness at different rates based on political and economic imbalances. Kadazan linguistic imperialism, it was alleged, had hijacked the Dusun speakers' right to their own language.

2.3.4. A literate people

The Catholic Mill Hill Mission opened schools to "Dusuns" in 1882, and participation of "Dusuns" in formal education gradually increased, although these were mostly from west coast Penampang and Jesselton (now Kota Kinabalu). By the 1950s a small band of educated "Dusuns" emerged who were "fluent in English but confident in speaking and writing also their own language in romanized script" (Lasimbang *et al.*, 2000; Reid, 1997 pg.125). They were the forefathers of "Kadazanism" who, with the exception of Stephens, were native speakers of Coastal Kadazan. In 1953 Donald Stephens initiated a section called *Kadazan Corner* in the Sabah Times (the colony's language daily). In doing so, Stephens used the Coastal Kadazan literary system that was devised by the Mill Hill Mission schools. From this point, Coastal Kadazan appeared in the print media and radio broadcasts (Lasimbang *et al.*, 2000). In 1960 the first dictionary called *Kadazan Dictionary and Grammar* was published, again based on the literary system of the Coastal Kadazan dialect. A published justification by Donald Stephens appeared in 1960:

"It was done in answer to a natural rising pride among the Kadazan peoples and knowledge of their desire to be known by their own name and not by a name which they feel had been nothing but a label hanged on them, put there by others without their consent... I feel that if the Kadazans are ever to feel *one* that common link should be strengthened, and there is no better way of strengthening it than by trying to standardise the language. The obvious answer was to start with the Kadazan as spoken in the Penampang/Papar area because it is in this area that the people have gone a long way in having their language written down... One could have picked the Kadazan [sic!] spoken in Tuaran or Kota Belud or Ranau for use but because the Kadazan spoken in Penampang and Papar were the most commonly understood and had already been used as a written language it was obvious that the best choice was the Kadazan as used in Penampang/Papar" (cited in Reid, 1997 pg. 126).

Thus, Lasimbang and colleagues (2000 pg. 4) argue, "began the development of the mother tongue in the heartland – Penampang". From the 1960s onwards, an increasing number of Kadazan language publications began to appear, from folk stories to historical accounts, and subsequently the production of traditional and pop musical records in Kadazan.

However far from being a central dialect that is representative of the Kadazandusun language family, Coastal Kadazan actually sits at the furthest end of the dialectic range (Reid, 1997). For example, the consonants "h", "v" and "z" predominant in Coastal Kadazan become "l", "w" and "y" in Central Dusun. Thus Central Dusun speakers had to learn how to read Coastal Kadazan so that they could understand the newspapers and Catholic prayer books. They had to make the mental conversions between differences in consonants, such as replacing the Coastal Kadazan "z" for a Central Dusun "y" in order for the words to make sense. Similarly, it is easy to see how a rural Central Dusun speaker would become familiar with the Coastal Kadazan dialect, while urban Coastal Kadazan speakers would not be familiarised with the Central Dusun dialect of their rural counterparts. It was only when education and literacy had spread to the interior regions that Dusun speakers became increasingly agitated at "reading" Coastal Kadazan, and were impatient to receive printed materials that represented their own spoken dialect (Reid, 1997). The Protestant churches released a Central Dusun (of Ranau) edition of the New Testament, and by 1990 a Central Dusun (of Bundu Tuhan) Bible was printed.

The formation of Malaysia in 1963, among other things, brought Bahasa Malaysia as the national language. The enactment of Bahasa Malaysia as the official Sabah state language in 1973 prompted a political campaign over the loss of mother-tongue languages in Sabah. It was believed that a heavy reliance on the use of Bahasa Malaysia and English was bringing about a pidginised Kadazan language and threatening the future viability of the language (Lasimbang *et*

al., 2000). Predictably, it was the revitalisation of the Kadazan language that dominated the agenda (vis a vis other Dusunic dialects), also coinciding with the spread of the KCA's popularity and influence. In 1984 a KCA Language Sub-Committee was established to coordinate the development of a standardised writing system for the Kadazan language (Lasimbang *et al.*, 2000). At the height of the PBS government in 1988, the Federal Education Minister, Anwar Ibrahim declared his support for the teaching of *Kadazan* [sic!] in Malaysian schools (Reid, 1997). This announcement spurred local leaders to rally for the documentation and systematisation of the language to reaffirm Kadazan and Dusun cultural identity. By this time, there was a prominent Dusun presence in the political machinery, and their persistent emotional protests succeeded in gaining recognition for the other Dusunic dialects. After much public debate, it was decided that any version of the language needed to represent elements of both Coastal Kadazan and Central Dusun. In 1995 a compromise was reached between the KDCA and USDA, and the official "Kadazandusun" language emerged, thus rendering equal recognition to both Kadazan and Dusun factions. Subsequently, the KDCA published a *Kadazan Dusun Malay English Dictionary* (Reid, 1997). This dictionary provided two forms for every word in the Kadazandusun language, the first in Coastal Kadazan followed by the equivalent in Central Dusun (of Tambunan-Ranau).

In 1995 the Kadazandusun Language Foundation (KLF) was founded to systematise the use of the official Kadazandusun language. One key task has been to synergise the Kadazan and Dusun orthographies into an official Kadazandusun language. Both KDCA and USDA had jointly agreed that the Bundu Liwan Central Dusun dialect (spoken in Kiau) would be used as the main reference dialect because it had the most number of speakers (Lasimbang, 1998). Thus the standardised Kadazandusun language aimed to incorporate words from other dialects and therefore be representative of all the dialects spoken within the Kadazandusun language family. It was this official standardised version of the Kadazandusun language that was re-introduced into schools as part of the formal academic curriculum in 1995, and is currently being used in the media and print publications. Lasimbang and Kinajil (2000, pg. 418) report that in the year 2000, "the Kadazandusun language was being taught to 19,731 children by 881 trained teachers, in 440 primary schools in 21 districts throughout the state of Sabah". The primary school in Kiau is one of these. Now entering its seventh year of formal teaching, school children from ages ten to twelve receive up to 120 minutes of Kadazandusun language classes each week. These classes, however, are held outside of normal school hours making it a burden for both teachers and students to stay on after school (Lasimbang, 1998). Additionally, more reading and educational materials are needed such as dictionaries to encourage the learning process. The KLF are engaged as linguistic consultants to the Sabah State Education Department to assist in the implementation of Kadazandusun language teaching in schools (Lasimbang, 1998).

The KLF also independently implements the propagation of the Kadazandusun language undertaking the training of teachers, coordinating writer's workshops, generating publications, responding to grassroots requests for literacy training, and supporting the development of local dialects. Recently, KLF published a pioneering five-language phrase book that cross-references between Kadazan, Mandarin, English, Malay and Bajau (Luan, 2003). Intriguingly, the phrase book is aimed at "young *Kadazandusuns* who are said to be losing their grip on their mother tongue" even though the book was admittedly "written using the Tangaa' dialect of the *Kadazan community in Penampang*" (Daily Express, 2003e) (emphasis mine).

2.3.5. In defence of Dusun

There is an apparent frustration in Kiau at the inability to read or write fluently in Dusun. The few reference materials in the village are "Kadazan" dictionaries, while people who do have "Dusun" dictionaries complain that it is replete with inconsistencies and confusing. More than often, people contend with improvising their own spelling and do enter into extended debate on the appropriate combinations of affixes to be used. Beaman *et al.* (1996) point out that the variation in actual pronunciation of words within Kiau, on top of the variation in pronunciation between closely neighbouring villages such as Kiau and Bundu Tuhan, makes for immense difficulties in deciding how words should really be spelt. Indeed, over about 150 years of botanical research around Mount Kinabalu, there has accumulated many variant spellings of Dusun place names and plant names because Dusun speakers and non-Dusun speaking researchers alike lacked any standardised reference point (Beaman *et al.*, 1996). The lack of an accessible Dusun literary system, and also because of protocol in dealing with government agencies, means that the majority of written work in Kiau is in Bahasa Malaysia. My own attempts at documenting in Dusun have resulted in frustrated hours of developing a standardised spelling and grammatical form, and often Bahasa Malaysia provides a safe refuge.

There seems to be very little acknowledgement of the work conducted by Tombung (1991), who is the only *local* reference known to me to have compiled a report on Dusun orthography. Tombung went to a considerable effort to provide a consistent and standardised form of Central Dusun, and is one of the references on Dusun orthography used by the KLF in the standardisation of the Kadazandusun language. Dusun contains unique properties such as the omission of the phonemes "e", "v" and "z" found in other dialects, and that the sound made by the consonant "c[14]" is missing. Tombung also noted that Dusun contains a high degree of integration of words (and sometimes spelling) from Bahasa Malaysia and English. The level of such "integration" was found to be particularly true in my own experience with spoken Dusun

[14] Representing the sound "ch"

in Kiau, where many English nouns (especially of power tools and construction terminology) had been "Dusunised" and used as naturalised elements of the dialect. A Dusun himself, Tombung appeared to have absorbed the logic of integration and specifically noted that his report on Dusun orthography was purposely systematised to be similar to Bahasa Malaysia. This would make it easier for Dusun speakers to learn to read and write in Dusun, because Bahasa Malaysia is the foundation for literacy in schools (Tombung, 1991, pg. xii).

My own data reveals a great deal of borrowing of words from English and Bahasa Malaysia (see chapter four). Children exhibit little knowledge of Dusun plant names; instead they identify plants using the common Bahasa Malaysia name. Predictably, the use of Bahasa Malaysia is far more widespread due to its compulsory status as the official language in schools. Pugh-Kitingan (1989 pg. 384) is especially critical of the national educational curriculum for contributing to culture loss among indigenous groups in Sabah. Classroom activities tend to focus on the use of Bahasa Malaysia, learning Malay nursery rhymes and nationalistic songs, in addition to other "useless activities such as making paper flowers and knitted toy animals [and] do nothing to encourage [schoolchildren] to learn the valuable skills of their own culture". I also found that the preference for using Bahasa Malaysia plant names in children is amplified when children, from a very young age, are sent away to schools far from the village. Young adults and teenagers did exhibit difficulties in trying to recall a Dusun name when the Bahasa Malaysia name occurs to them in the first instance. Dependency on government agencies and penetration of non-Dusun speakers as a result of improved roads and increased trade have all contributed to the pervasiveness of Bahasa Malaysia. Families nurture positive attitudes about including Bahasa Malaysia into their dialogue as part of helping their children at school but also as part of subscribing to a more modern and educated lifestyle (also Florey, 1993; Kulick, 1997). The failure to circulate any written materials in Dusun further compounds the community's inability to understand the system of spelling and grammar. It is an understanding that would have provided Dusun speakers with the tools to help perpetuate the integrity of the Dusun dialect. In fact, Tombung's research was only published in Bahasa Malaysia, on a small scale, and it only materialised in 1991, which was rather late because by then confusion over who and what was "Kadazan" or "Dusun" was deeply embedded in the ethnic politics of which cultural group deserved to be more dominant.

2.3.5. The political context

Achievements in the development of a literate people under the unified Kadazandusun language have been highly acclaimed success stories in urban and educated circles. Lasimbang (1998 pg. 96), who heads the KLF, states that "when a language of a certain people is taught in formal

education, the [speakers] get recognition as an [ethnic group[15]] within the country. This will be true for the Kadazandusun community". In the interior villages around Kinabalu, the story is slightly different. One can sympathise when people in Kiau consistently point out that Kadazandusun publications are in fact Kadazan and still not representative of the Dusun dialect they speak. They feel the Kadazandusun dictionaries in their possession are confusing because they have difficulties blending the Kadazan literary system used therein with the Dusun they speak. Similarly, radio broadcasts and commercial music albums that have been marketed as Kadazandusun are digested by people in Kiau, and then comfortably dissected as belonging either to the Coastal Kadazan dialect or Central Dusun dialect, but very seldom acknowledged as Kadazandusun. Nonetheless, parents in Kiau are supportive over the move to introduce the official Kadazandusun language in to the primary school at Kiau because it is one important step towards reinforcing the use of their Dusun mother tongue.

The emergence of an official Kadazandusun language was an extraordinary political manoeuvre with fascinating cultural implications (also Kessler, 1992). Primary schoolchildren are being taught the Kadazandusun language, who over years of formal learning, will purportedly be able to subscribe to the official Kadazandusun cultural identity. The difficult question arises as to how a professional body of linguists and their associates can pursue the widespread acceptance of the Kadazandusun language given the implicit political nature "Kadazandusunism" harbours. To a very large degree, reversing the loss of mother-tongue languages has taken a top-down approach that poses great challenges for its acceptance among a heterogeneous general public, particularly given the existing variability found in Dusunic dialects spoken in various communities. In Kiau, this has meant that workshop sessions carried out by the KLF have had to first be conveyed in terms of the Dusun spoken in Kiau, before any mention of Kadazandusun can be introduced. In areas where the cultural authenticity of a "Kadazandusun" identity is itself in doubt, the future tenure of a Kadazandusun language depends largely upon the willingness of the people to adopt an identity they do not yet recognise as their own[16].

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[15] I have substituted the term "ethnic group" to replace the term "race" originally used by Lasimbang in her text. The concept of "race" refers more to physical attributes such as skin colour, hair and height, while "ethnicity" refers to cultural aspects such as language, cosmology and custom (Basham, 1989; King, 1989). While I do not have license to presume what Lasimbang's understanding of the concept of "race" may be, I believe that based on a reading of her writings that the concept of "ethnic group" more appropriately captures the essence of her argument and is certainly the conceptualisation that I am relying on in this dissertation.

[16] I also think of the future tenure of the official Kadazandusun language in terms of how an artificial hybrid is going to stabilise (i.e. become a self-reproducing unit with its own individualistic characteristics that develop independently of its parent dialects) in a wider political and cultural ecology.

SECTION FOUR: TO NAME AN IDENTITY

2.4.1. Whither the people?

The systematic classification of ethnic groups in Sabah is a difficulty that has been debated by demographers, academics, and administrators alike, to little satisfactory end (Appell, 1969, Ave & King, 1975; also King, 1989). Difficulties in disentangling the distinct identities of these indigenous groups can be attributed to several factors (Appell & Harrison, 1969; Sullivan & Regis, 1981). Ethnic groups in Sabah are characterised by a history of changing land use patterns, intermarriage and migration. For instance, the slave trade of the 16th to 19th centuries captured indigenous women, many of whom were displaced and forced into marriage with men from other ethnic groups (Warren, 1981). Slavery itself motivated movements of populations either for refuge or as part of resettlement. Transitions in agriculture from hill rice swiddens to wet rice also spurred the resettlement of social groups, further compounded by more recent migrations seeking formal wage labour. Both the Chartered Company and the British colonial administration thereafter recruited and encouraged the migration of workers from the Netherlands East Indies (Indonesia), the Sulu seas (partly the Philippines), Cocos Islands, India, Japan and China. Towards the 20th century, large groups of predominantly male Chinese workers started migrating to North Borneo to work on tobacco plantations. Intermarriage between Chinese workers and indigenous women was common practice, thus pre-empting the supposition that intermarriage between various indigenous groups themselves was normal fare.

The difficulty of determining ethnic identities can also be attributed to the geography of Sabah (also Harrisson & Harrisson, 1971; King, 1993). The long coastline provided easy access to predominantly Muslim populations of Malays, Bajaus, Suluks, Bruneians, Illanuns and Indonesians, and to other traders like the Chinese. The bulk of the indigenous peoples however, were in the interior, which was at the time, a remote area with few roads and little communication. For the ease of administration therefore, colonial officials used various names to label groups of indigenous peoples whom they believed to belong to the same identity. The Chartered Company adopted the word "Dusun" derived from a Malay term meaning "orchard" to describe the various clumps of agrarian peoples in the interior (Reid, 1997). St. John, in his travels around North Borneo, noted that "Dusun" was a term used by the Malays to refer to the same people the Bajaus referred to as "Ida'an" (St. John, 1986). Similarly, the term "Murut" (literally meaning hill people) was used to identify hunter-gatherer communities who lived along the hills and valleys. This form of ethnic labelling makes for some very confusing results (Appell, 1968). In 1890 the administration produced a list of indigenous groups as "Booloodoopy, Doompas, Eraans, Dusuns or Sundyaks divided into many tribes including the

Roongas, Kooroories, Umpoolooms, Saga Sagas, Tambunuas, Tingaras, Roomanows and Tegaas" (Sullivan & Reid, 1981 pg. 549).

The first census conducted by the Chartered Company in 1891 was incomplete because officials were not able to reach the peoples living in the remote interior areas, but nonetheless showed indigenous peoples clumped under one category of "Dusuns, Muruts, Kadayans, Bisayahs etc." to represent the majority of the population. The 1931 census report states that "there is no doubt that a good deal of confusion and doubt exists in the minds not only of the enumerators but of the natives themselves as to which sub-division they really belong" (cited in Jones, 1966 pg. 14).

The classification of indigenous groups remained a problem that plagued the entire colonial period, and still nags us today. There was a constant changing of classifications, whereupon exonyms and autonyms were used inconsistently across census takings to the effect that indigenous people often did not relate to the classifications prescribed in the census (Appell, 1968; King, 1989; Sullivan & Regis, 1981). Following independence and self-government in 1963, the term "Kadazan" was used to replace the "Dusun" category in the 1970 census, which represented a reclassification of all groups who were previously "Dusun" to be either "Kadazan" or taking own "separate" categories. By 1980 however, any previous classifications of indigenous groups was abandoned and all indigenous peoples were now lumped together under the category *Pribumi*. Strangely enough, individual ethnic labels reappeared again in the 1991 census (displacing the *Pribumi* category), this time showing a breakdown according to the individual names of indigenous groups.

Does anyone really know who they are? For a start, years of inconsistencies in official documents and reports given to census takers have made it difficult to conclude on anyone's definitive ethnic identity. There were also inconsistencies in the classification of mixed marriages, and a Sino-Native category appeared for the first time in 1951 although it seems uncertain exactly whom it sought to represent. The confusion certainly stems from a top down approach to classification, where census categories and labels applied according to the administrative humour at the time does not reflect the self-perceptions of ethnic groups (King, 1989). It is, however, a little hasty to underestimate the strength of an internalised exonym, and certainly, the Dusun label that was once considered a colonial imposition is now persistently described, particularly at ground level among the Kiau Dusun, as an autonym (Johari, 1989). Indeed, for the Dusuns and Kadazans, the issue of ethnic identity turned into a rhetorical argument over ethnic names, until the act of ethnic labelling itself became a powerful political tool.

2.4.2. Dusun or Kadazan?

Researchers agree that the overarching rule still stands - Dusun and Kadazan people share the same myth of origin and their socio-cultural composition is largely similar except for regional variations such as in dialect, dance and costume (Glyn-Jones, 1953; Loh, 1992; Pugh-Kitingan, 1989; Reid, 1997). Their shared ancestry is determined from the Nunuk Ragang myth of origin whereby they recognise "all other groups of Dusun who come from Nunukragan as their own people. Those who do not come from Nunukragan are not Dusun" (Glyn-Jones, 1953 pg.117). According to the myth, the Nunuk (*Ficus* sp.) Ragang (red) tree opened up to give birth to the first people, and from the base of this tree, their children spread out across the land. Essentially, they are the same people, using two names - "Dusun" has been the generic term although usually referring to the bulk of the population who live in the interior, and "Kadazan" has been a specific description of Dusuns who live in the coastal Penampang and Papar plains (King, 1993). In the census data, the generic term "Dusun" was used for a good 79 years before it was replaced with the term "Kadazan". By 1970, the improved road networks, increased job opportunities, education, medical services, and wet rice cultivation had attracted the migration of interior peoples to the coastal areas (Sullivan & Regis, 1981). In effect, they grew into settlements of Kadazans who then felt that the word "Dusun", representing the rustic rural agrarian lifestyle of the interior, was unsuitable to describe the growing coastal population that was becoming more educated and modern (Johari, 1989). They removed the generic name "Dusun", and replaced it with their own label - "Kadazan".

The roots of the word "Kadazan" are still largely debated (Reid, 1997). Those who doubt the indigenous roots of the term believe that it was derived from the Malay word *kedai* meaning shop, thus it would be *kadayan* in the interior dialect, and *kadazan* in the coastal dialect. There are others still who believe that it was borrowed from the term *kakadazan*, which is the word for "towns", thus meaning people of the towns. Whichever the case, there was a general consensus that "Kadazan" had connotations of an urbanised and commercial people as opposed to the "Dusun" farmers of the interior.

The renaming was not well received by the Dusun leaders of the interior, but their protests were largely muted and the new label stuck. By the mid-1980s the "Dusun" political faction surfaced that accused the "Kadazan" government of "Kadazan" cultural imperialism. Despite acknowledging their shared ancestry and common culture, Dusuns now accused Kadazans of over-riding their language and hijacking their culture. On the one hand, they were the same people whichever name was used. On the other hand, using either "Kadazan" or "Dusun" as a singular label to represent the overall population of Kadazan and Dusun peoples would be to credit one side with cultural and (therefore) political supremacy (Kessler, 1992). After several

attempts at renaming themselves "Kadazan-Dusun", or "Kadazan/Dusun", or "Dusunkadazan", it was settled in 1989 that they would call themselves the "Kadazandusun" people.

2.4.3. The virtue of identity

In an age where the concept of "virtual reality" is well understood, I would contest the validity of a true "Dusun", "Kadazan", or "Kadazandusun" identity that can, in any way, be reflected in the reality of day-to-day life. I would argue rather, that these identities are artefacts of a top down classification system that has been both unrepresentative and inconsistent. Ethnic names and ethnic identities have been used as political constructs to glue together emotive aspects of ethnicity to create an image of a people that is politically marketable (Appell, 1985). These repackaged identities are in one sense crystallised ideals of what a people should be like, and yet at the same time have the fluidity to manipulate the perceived boundaries of ethnic identity – today we are one people; tomorrow however, we are not (Turner *et al.*, 1994). Any issue with regional varieties in dialect or dress has been disregarded when there is a political need for unity, but dissected to its most detailed distinctiveness when there is a need to spur political disunity. In effect, these are "virtual identities" whose permeable boundaries of inclusiveness and exclusiveness can be contracted and distended given political will (Johari, 1989). Above all, because ethnicity is seen as the basis for loyalty, the creation of a larger ethnic unit such as a conjoined Kadazandusun identity allows linkages to be formed with others who would otherwise be outside of established kinship bounds (Basham, 1989). A united Kadazandusun identity therefore contributes to the political legitimacy of a wider cultural movement.

There however exists a great discrepancy between classifications instituted from the top down, against the indigenous people's perceptions of their own identities. For a start, the term "Dusun" assumes a homogenous composition of people, while in fact there is a diverse range of Dusunic peoples that have been clumped under this label. The determination of an identity is far more complicated than what political opportunism has hoped to achieve. This is a fundamental problem with government directives to establish a particular identity where, for example, the National Culture Policy is based on a presumption that ethnic identity can be controlled and determined by way of state enactment. On the contrary, King (1989 pg. 237) argues that ethnic identity is determined on the basis of a "[shared] recognition of a common origin and history and also certain elements of what we call 'culture'". In these terms, shared origin refers to common descent or kinship affiliations, in addition to what King terms "territorial affiliation". This is perhaps illustrated in the case of Kadazandusun ethnic identities, where the Kadazan and other Dusunic groups share the recognition of the Nunuk Rangang origin myth and other shared customary practices as the basis of their shared identity. Given, however, the high levels of social mobility in Sabah, there is a range of Dusunic groups scattered across the state who have

distinctive and individualised cultural characteristics quite easily distinguished according to the region where each group is staying. It is as though the parent identity has grown offshoots of specific identities that have each developed their own unique cultural imprint very much linked to the geographical territory that they inhabit (Johari, 1989). Furthermore, King argues that ethnic identity is also a product of history. As I discussed earlier, although the Kadazans and Dusuns may share the same origins, they most certainly do not share the same history, particularly in terms of an emergent political and cultural consciousness. In Kiau they have great pride in being Kiau Dusuns which, to them, is an identity that is rooted in their lands, their village, their family, and their relationship with Mount Kinabalu. On occasion, I have asked people if they see themselves as "Kadazandusun" only to receive sympathetic nurturing smiles, as given to those whose innocence clouds the ability tell the difference between a picture of a *durian* from the actual *durian* itself.

My research reveals that ethnic politicking to a very large degree remains the occupation of ethnic politickers. However, this implicit awareness about political constructions of ethnic identity has had its uses to the Kiau Dusun, for example, to expedite the approval of land claims. "Dusunism", "Kadazanism", and "Kadazandusunism" have all been used to open doors for rural development projects, agricultural subsidies and educational scholarships (Gudgeon, 1981). In other words, I contend there are two co-existing layers of ethnic identity (Goodenough, 1969; King, 1989), particularly in the case of the Kiau Dusun. The first layer is the ascribed identity of being Kiau Dusuns as a consequence of Kiau-specific qualities over and above any shared origins and history with other Kadazandusun groups. This is the most prominent layer of identity in the Kiau Dusun community as a whole. The second layer is the achieved identity of being "Kadazandusun" or "Kadazan" or "Dusun" or "*bumiputra*" or "Sabahan" or "Malaysian", by identifying with perceived prototypical characteristics of these political constructs. Rather crudely, a Kiau Dusun can choose to portray himself as a Kiau Dusun or a Kadazandusun if and when the situation benefits him the most. As King (1989 pg. 239) argues, "an individual or collection of individuals can change their identities and become something else... [where determination of ethnic identity] may be crucially dependant on interaction with others".

Certainly, the work of John Turner and his colleagues that I have encapsulated in the *eye of the beholder* argument in chapter one, is based on the very notion that individuals and groups display the ability to psychologically switch back and forth between a range of social identities, sometimes doing so as a consequence of opportunistic motivations (see chapter one). What becomes interesting is to understand the symbiotic nature (if any) between the co-existing layers of an ascribed Kiau Dusun identity and an achieved "Kadazandusun" or "Sabahan" or "Malaysian" identity, an issue that I describe to some degree in chapter three and is worthy of detailed research in future.

SECTION FIVE: SPIRITS OF THE LAND

2.5.1. An identity of the soil

Scholars agree that indigenous communities traditionally have a holistic worldview that includes perceptions of the natural environment, where the landscape and the natural resources within, possess both a spiritual and material value (Dove, 1985b; Evans, 1970; King, 1993; Lasimbang, 1996; Nicholas, 1996; Posey, 1999; Regis, 1996). Elements of the environment are under the stewardship of guardian spirits who must be respected and whose advice must be heeded so that humans can tap into their resources for their daily needs. The annual routine of a community is founded on equilateral commitments to observing a respectful homage to the spirits that inhabit the earth and in turn, a responsible consumption of the material goods of the earth (Dove, 1997). The ways they interact with their lands form the basis of their livelihoods, and therefore their culture. Transformations in their relationship with the environment inevitably leads to transformations in perceived identity, in such that a loss of control over how one lives can affect the way one evaluates his or her person.

2.5.2. Spirits of the earth

Traditionally, the Kadazandusun people believe in the spirituality of the natural environment, where "all objects have indwelling spirit and therefore need to have ceremonial observances to appease and ward off by means of offering, otherwise the evil spirits or *rogon* will cause sickness and disease" (Lasimbang, 1996 pg. 178; also Pugh-Kitingan, 1989; Yap, 1985). For the Kadazandusun, the *bobolian* (priestesses) are the link between the spirit world and the material world of humans (Lasimbang, 1996; Regis, 1996). *Bobolian* are, without exception, highly respected elderly women in the village who are authorities on spiritual matters and are able to perform ritual ceremonies to appease spirits with offerings. For instance, the Dusun *membaraian* (taking of the rice soul) where the *bobolian* reaps seven ears of rice to bless the harvest is a ritual that is both spiritual and poetic (Evans, 1970). The *bobolian* are also the traditional healers and midwives for their communities, and are exceptionally skilled in traditional medicine and ritual healing.

Hence, before there was God, the *bobolian* embodied the spirituality and cosmology of the Kiau Dusuns. History, however, tells us that Christianity has been a regular visitor to Sabah probably as early as 1322 starting with Roman Catholic missionaries followed over the centuries by Anglican, Basel, Seventh Day Adventist, and other Christian missions (Pugh-Kitingan, 1989). Sometime in the 1950s, the Catholic Church and the Sidang Injil Borneo (SIB or Sabah Evangelical Mission) Church arrived in Kiau. Today, the *bobolian* are still respected as cultural authorities, midwives, and for their expertise in medicinal plants, but it is the authority of the church that presides over religion, in as much the same way as the myth of origin has been re-

rooted from Nunuk Ragang to Genesis. What is left of the rituals and offerings of old that are still in practice today, is perhaps, a combined result of both church action and modern medicine. The *bobolian* blessing of a celebration and the annual summit climb offering are now seen as symbols of cultural heritage rather than religious conviction (see chapter three). Spirits, we know now, live in heaven (or hell) and not the top of Mount Kinabalu. Increasingly, complex concoctions of medicinal plants are often replaced by the convenient Panadol, and travel to private medical clinics or hospital is a convenient solution. Home birthing has rapidly declined not just because of medical services, but also because it is easier to obtain a birth certificate with a hospital delivery. Hardly any effort has been made to learn or document the knowledge of the Kiau *bobolian*, and the passing of these elderly ladies will mark the greatest loss of traditional knowledge and entomb their spiritual culture in the past.

The spiritual and material relationships between the Kadazandusun and the natural environment are governed through *adat*, which is a body of oral traditions accumulated over generations of experiences. *Adat* is the basis for customary law (Lasimbang, 1996; Tongkul, 2002). According to *adat*, lands, forests and the resources therein are inalienable communal resources that cannot be bought or sold, and are the collective property of the community. The right to use natural resources, either by individuals or the community at large, is made possible by observing the codes of conduct including *pantang* (taboos), and *sogit* (payments). The power of arbitration in *adat* remains vested primarily in the village head, but in practice it assumes the collective wisdom of village elders and religious leaders like the *bobolian* who are to be consulted in the arbitration process. In the case of land, individuals can claim customary rights through mutual agreement in the village, whereupon rights will revert back to the collective possession of the community once the individual no longer needs the land. Once rights to land have been granted, *adat* governs the rightful behaviour and treatment of that land, and the contravention of *adat* will lead to trial by either the *Ketua Kampung*, the Native Chief or the Native Courts.

2.5.3. The inalienable right

Land is the central organ of indigenous culture because its ownership and use are inherently part of local people's spiritual relationship with the natural environment, and is the means of production upon which their lives are sustained (Nicholas, 1996). Loss of land represents a decimation of their livelihoods and the inability to engage in the cultural expressions that connect community life with the natural world. It is arguably the most tragic blow to indigenous culture.

Customary rights over land can best be illustrated through the swidden system, which is the dominant system of agriculture of many Bornean communities (Appell, 1985; Dove, 1985b;

Evans, 1970; Freeman, 1955; Sather, 1992), and that of the Kiau Dusun. There are several key features of swidden agriculture that reinforce the spirituality of the land, the community of the Kiau Dusun, and embody a holistic system of reciprocal exchange between humans and their natural environment. First, although these subsistence farmers rely heavily on hill rice as the staple crop, the fertility of the soil is guarded by inter-planting their plots with a diverse range of crops like *jagung* (maize), *mundok* (tapioca), *guol* (taro), fruits, and vegetables. Traditionally, the ability to read the natural elements, punctuated by spiritual offerings, provides assurances for the fertility of the soil, precise timing of the cultivation cycle, and a fulfilling harvest (Makitaak, 2001b). Second, swidden farming is family farming, where the whole extended family finds opportunities to contribute communal labour throughout the rice cycle (Appell, 1985). Third, the cyclical swidden calendar itself reflects a deep understanding and respect for the symbiosis needed between human extraction and environmental regeneration so that ecological processes can continue to sustain human life.

In establishing a swidden plot, the farmer will open his piece of land for cultivation (if needed, this involves consulting with neighbouring farmers that all are in mutual agreement) (Lasimbang, 1996). Each plot is demarcated using *wolit* (boundary stones), where the number of stones represents the number of adjacent plots (e.g. three stones means there are three plots converging at this *wolit*) (see Plate 2.5.1). A *dolok* (also used as ornamental plants in the village area) is planted at the centre of the *wolit*, because a *dolok* will always grow back even if it has been accidentally chopped down or burned. Evidence of an uprooted *dolok* points to boundary gerrymandering by some guilty party whereupon reference of such an incident to the *Ketua Kampung* is inevitable.

Photo © Mailim Sampang

Plate 2.5.1. A *wolit* (boundary marker) in Kiau Nuluh. Three boundary stones represent the three pieces of land that converge at this *wolit*, where gaps between the stones represent the boundary lines. A *dolok* is planted in the middle.

In Kiau, much like other swiddening communities, the act of opening land for cultivation establishes the farmer's customary rights over that land that are, in general, considered as permanent usufruct tenure (Appell, 1985; Dove, 1985a). In Kiau, this stage is known as *rumilik* where the men clear the land by felling the trees, although they do tend to leave fruit trees and larger canopy trees as cover. Traditionally, it is the women and children who help to clear the accumulating undergrowth (Rutter, 1985), but is becoming less so as children are now required to attend school. Once reasonably dry, the farmer will set fire to the plot, an often misunderstood technique that actually accelerates the rate of decomposition allowing nutrients to flow swiftly back in to the soil (Geertz, 1963; King, 1993; also Nakashima, 1998). A successful *tumutud* (first burn) is always desired; otherwise the farmer will have to conduct a subsequent firing (*mongurak*) to make sure all remnants have been properly burnt. In the worst case, that is if there are still bits and pieces that have not been properly burnt, then the farmer will collect and pile all remnants for a final burn (*monganit*), which rather resembles a bonfire of reasonable magnitude (also King, 1993). After burning subsides, the period of cultivation commences. As a general rule, the whole family participates in *monugal* (sowing the rice), followed by *gumamas* and *mogintoguli* (two stages of weeding) that is normally done by the women. While waiting for the rice to grow, farmers also undertake *momuhau* (scaring away birds), which given the advent of plastic, now leads to endless strings of multi-coloured plastic bags criss-crossing the plot. Once the rice has matured, the family comes together again to complete the harvest (*mongomot*).

Short cycle crops such as *guol* (taro) and *mundok* (tapioca) inter-planted in the swidden plot are harvested and replanted throughout the swidden year, or are harvested as part of *mongihang* (clearing a plot for a new rice cycle). At the start of the next planting season, the farmer will return to his plot to begin the *rumilik* (clearing) and *monugal* (sowing) for a fresh cycle of rice cultivation. Traditionally, the swidden calendar of selecting land, clearing, burning, sowing, weeding, guarding, and harvesting rice is punctuated by rituals and spiritual offerings for a bountiful harvest (Freeman, 1955; also Williams, 1965; Makitaak, 2001b). At the end of the rice year, the farmer opens a new swidden plot leaving the old plot to fallow. During the fallow period the farmer leaves the old plot undisturbed to allow natural regrowth to occur, but often continues to keep an eye on any remaining fruit trees and other useful plants that may crop up over the coming years. The rights of the farmer to land that is under fallow is recognised under *adat*. The swidden farmer maintains this rotational system of cultivation and fallow for about five or seven years in each cycle, depending on how much arable land is available. This gentle rhythm of rigor and rest enables the land to breathe and regain its natural fertility so that when the family returns to their first plot, the fallow has rejuvenated and transformed into young secondary forest ready once again for cultivation. Seen in totality, the swidden system creates a mosaic of different forest patches at different stages of regeneration that supports a vast variety of natural and cultural resources (Nakashima, 1998).

Swidden farmers, including those in Kiau, are largely subsistence farmers. They rely on a successful harvest to feed their families, and any surplus crops would be traded locally for a small profit. They also rely on their families to provide the extensive labour that is required to maintain a swidden plot, although increasingly people are using chemical fertilisers and pesticides to lighten the burden. The swidden cycle is arguably the central fixture of their annual calendar, as it determines periods of intensive activity tending the plot, laxer periods of rest while waiting for the crops to mature, times when families come together to work together, and the time for *Kaamatan* celebrations at the completion of the harvest. Yearly adventures of overcoming harsh conditions teach farmers to listen closely to the natural elements; they come to understand the nature of the soil, read the humidity by testing the morning dew on the leaves, gain expert knowledge about crop resistance over years of experimentation with cross breeding traditional varieties, and in return, a successful harvest is humbly attributed to the generous and good humoured spirits of the earth. It is an intimate relationship of immense ecological knowledge, agricultural skills and soulful spirituality (King, 1993). Ultimately, the swidden cycle imbues upon the farmer an inalienable relationship with his means of production, and therefore an inalienable right to land as the foundation upon which his spirituality, culture, personal life, and those of his family, exists.

2.5.4. Legislating the land

Adat has been the primary means of arbitration for indigenous rights to land, but its largely unwritten form, spiritual connotations, and reliance on elaborate community consultations, has presented problems for ruling administrations. The Chartered Company profit motive justified the introduction of formalised land laws that would establish a centralised code for law and order, and permit the access of all peoples, indigenous or otherwise, to rights over land and the resources found therein. These laws were adapted from the Indian Acts and Ordinances of the Straits Settlements and its legislation in North Borneo made no reference to existing customary practices or customary laws of the indigenous peoples (Lasimbang, 1996). In effect, these land laws transformed land from a collective community resource into a commodity that is "devoid of spirituality and life. It can be bought and sold, exploited upon and profited from" (Lasimbang, 1996 pg. 190). Land came to be under the control of the state administration. The right to own land is determined through private lease or title, where all claims to land have to be applied for, officially demarcated on the ground, registered, and approved by the colonial administration. Very quickly, indigenous peoples found their customary rights to land, and their *adat*, invalidated.

Upon integration with Malaysia in 1963, administration of Land and Forests remained under the authority of the state of Sabah. In part, this was a political strategy of caution to offset any potential of being exploited by Malaya, and to establish state control over these critical natural resources. It was also in recognition of the historical and cultural relationship between the indigenous peoples in Sabah and their natural environment, and the need to safeguard their customary rights over natural resources. In response, the Land Ordinance (Sabah Cap 68) declared areas of State Town Lands and State Country Lands covering all land not yet reserved for other purposes (such as Forest and Wildlife reserves) as land that is open to application and entitlement (Lam, 2002). State Country Lands also included areas set aside for village settlement, whose rights remain vested in government and are not eligible for entitlement, but is entrusted to the administration of the JKKK.

Crucially, the Land Ordinance makes reference to, and provides legal protection for, Native Customary Rights (NCR). According to Section 2 of the Interpretation (Definition of Native) Ordinance (Sabah Cap. 64), a Native is any person who (at least one parent) belongs to an indigenous community in Sabah (Lam, 2002). With regards to more recent immigrants, a Native can be any person who is ordinarily resident in Sabah and is a member of the Suluk, Kagayan, Simonol, Sibutu, or Ubian people, or a member of an indigenous community in Sarawak or Brunei, and has lived as a member of a native community for a continuous period of three years immediately preceding his or her claim to be a native (Lam, 2002). A Native can also be any

person who is ordinarily resident in Sabah and is a member of an indigenous community in Indonesia, or the Sulu Islands in the Philippines, or Peninsular Malaysia, or Singapore, and has lived as a member of a native community for a continuous period of five years immediately preceding his or her claim to be a native (Lam, 2002). In sum, native status in Sabah can be conferred upon any person who has established his or her status as a member of an indigenous community in Sabah, Sarawak, Peninsular Malaysia, Brunei, Singapore, Indonesia or the Sulu Islands in the Philippines.

Under NCR, a native is entitled to *a priori* rights over land if he or she can show evidence that the said land has been occupied according the customary law or *adat* of his or her community (see Box 2.5.1). Section 65 of the Land Ordinance defines Customary Tenure as the "lawful possession of land by natives by continuous occupation or cultivation for three or more consecutive years or by title", and Section 66 confers a "permanent heritable and transferable right of use and occupancy" to the native.

Box 2.5.1 Native Customary Rights (Source: Sabah Cap 68)

Under the Sabah Land Ordinance (Cap 68) Section 15, Native Customary Rights refers to rights over:

- Land possessed by Customary Tenure
- Land planted with fruit trees, when the number of fruit trees amounts to fifty and upwards to each hectare
- Isolated fruit trees, and sago, rattan, or other plants of economic value, that the claimant can prove were planted or upkept and regularly enjoyed by him as his personal property
- Grazing land that the claimant agrees to keep stocked with a sufficient number of cattle or horses to keep down the undergrowth
- Land that has been cultivated or built on within three years
- Burial grounds and shrines
- Usual rights of way for men or animals from rivers, roads, or houses to any or all of the above

The legal status granted to NCR means that customary rights to land are legally upheld, but nonetheless still has several severe limitations. Ultimately, land remained under the control of the state administration primarily through the offices of the state Department of Lands and Survey (DLS), and in part through the overall jurisdiction of the Natural Resources Office (NRO) under the Sabah Chief Minister's Department (Lam, 2002). Although "lawful possession of land" through customary law was recognised, its legal status was only conferred upon application to, and subsequent approval by, the DLS (also Appell, 1985). Thus even though land possessed through NCR provides the native with prior rights over any other applicants, the native would

nonetheless be required to fulfil government application procedures to obtain legal ownership through state issued entitlement. These procedures are often time consuming, costly, require repeated travel to the district DLS offices, and are complicated by disputes caused by overlapping claims to land. Furthermore, a precondition of titled land is that it needs to be surveyed and its boundaries measured by DLS officials so that it can be systematically registered. The preference for straight-line boundaries on the part of DLS officials (making it easier to measure), and the customary practice of boundary marking by way of landmarks and *wolit* (rather zig-zaggy boundaries) makes for lengthy periods of confrontation with no certain guarantee that the entitlement would represent the exact area of land the native had originally desired. This cumbersome procedure is a huge obstacle to many natives, and ultimately it is the fear of losing their land that convinces natives to apply for entitlement before their land is awarded to another party.

Another crucial flaw of NCR is that the legislation fails to recognise customary rights over fallow, which is upheld in *adat* (also Mering Ngo, 1996). According to the law, it is possible for idle land to revert back to the government if it is abandoned or uncultivated for a period of three years or more. For each new entitlement, landowners are required to commence cultivation within six months of entitlement (although it is often the case that the land has already been cultivated for some time through customary tenure), and to bring the entire area into cultivation within three years. Furthermore, at least one third of the said piece of land has to be kept under continued cultivation. Areas not under cultivation can be repossessed by government. This presents immense pressure on native farmers to maintain intensive levels of cultivation and to reduce the fallow period to less than three years, in order to keep their legal entitlement to their land. More significantly, it carries an implicit encouragement for farmers to abandon rotational swidden agriculture for more productive forms of sedentary cultivation.

Enforcement of NCR in practice is also problematic. The lengthy delays involved in filing a completed application can mean that a farmer's NCR claim arrives too late, and land entitlement has already been awarded to another party, native or otherwise. This farmer has therefore lost out on his legal claim for land that he had been cultivating for many years now. There are also situations where government agencies themselves have disregarded NCR claims, and instead declared that land for plantations, mining operations, and logging schemes (Lasimbang, 1996). These large-scale operations involve building roads, bridges, and new settlements for the operation's workers, and can result in the forcible resettlement of the existing indigenous community to an alternative location (also King, 1993). Often compensation is offered in terms of infrastructure development such as electricity and roads. At the end of the operation, the land is

supposed to revert back to the state and is open for entitlement again but it is often the case that the soil has been rendered infertile.

Upon entitlement, the native receives a Native Title (NT) deed to his land granting legal rights over his land, whereby NT is perpetual in basis (Lam, 2002). NT landowners are exempt from paying rental dues for the first six years upon entitlement, and thereafter charged a nominal annual fee (about fifty sen per acre). By law, the area open for inclusion under NT shall not exceed twenty hectares, except in the case where there is written authorisation from the NRO. NT however, only conveys surface rights and does not convey any rights to minerals, oil, rivers, streams and the banks of such waterways, which remain vested in the government. Any extraction of such resources from NT land is compensated in a manner deemed appropriate by the relevant authorities. Furthermore, NT can be converted to Country Lease but this only applies for development projects such as building roads, waterways or establishing plantations (Lam, 2002). Often, attractive sums of money are being offered as compensation to the NT landowner.

At its initial establishment, the Land Ordinance prohibited any sale or lease of NT to any non-natives (except in the case where there is written approval from the relevant Ministry). In 1989 however, the ruling PBS administration felt that development of NT lands was lagging, and NT lands should be developed on par with Town and Country Lands. On 28 December 1989, the PBS government approved an amendment to Section 17 of the Land Ordinance that allowed NT to be subleased to non-natives for a term not exceeding 99 years (Makitaak, 2001a). This presented a potentially explosive provision as it opened the door for natives to profit from the long-term rental of NT lands that had originally been given preferential approval through NCR. Conversely, it also enabled non-natives to seek opportunities for land conversion activities such as logging, mining, and plantation agriculture in areas that were previously inaccessible due to *a priori* NCR claims. Furthermore, the 99-year sublease period was seen as a political euphemism for the actual sale of NT land, and natives were often offered sums in the form of lump sum sale prices rather than annual rental rates (Makitaak, 2001a). The long sublease period denied native children and their descendants the right to inherit the land, and should there be no evidence of a living survivor at the end of the 99 years, the land would revert back to the possession of the state. In March 2001a, PACOS (Partners of Community Organisations) a community-based NGO reported that 21,198 hectares of NT lands were under sublease for a period of 99 years (Makitaak, 2001a). Only in 2000, under the BN coalition government, Section 17(5) was amended to reduce the sublease period of NT land to non-natives from 99 to 30 years (Lam, 2002). It was seen as a compromise between protecting the interests of NT landowners and the pressure to enable development on NT lands.

2.5.5. Fruits of the forests

In a similar move, other natural resources came under the control of the state administration through a number of other pieces of legislation. Despite acknowledging the reliance indigenous people place on natural resources, there is meagre legal recognition of customary rights or the intellectual property rights of indigenous communities over their traditional ecological knowledge. Instead, the relationship between indigenous communities and their environment has been defined primarily in terms of resource extraction. Elements of community, spirituality and recognition of *adat* itself is missing. For our purposes, the overlap in jurisdiction over State Land activities found in the Forest Enactment 1968 merits a brief mention. Section 23 of the Forest Enactment legislated control over forest produce found in all State Lands, where forest produce includes "timber, firewood, charcoal, *getah*, wood oil, bark, extracts of bark, copal, *damar*, and *atap*... trees and any produce thereof, silk, cocoons, honey and wax" (see Box 2.5.2). Indigenous peoples were granted an exception so long as their extraction of forest produce was for subsistence and not commercial profiteering.

Box 2.5.2 Extraction of forest resources (Source: Forest Enactment 1968)

The Forest Enactment 1968, Section 41 states that natives may extract forest based products from State Lands for the purposes of:

- The construction or repair of a dwelling-house for the abode of himself and his family
- The construction of fences and temporary huts on any land lawfully occupied by him
- The construction or repair of native boats
- The upkeep of his fishing stakes and landing places
- Firewood to be consumed for his domestic purposes
- The construction and upkeep of any work for the common benefit of the native inhabitants of his *kampung*

The Forest Rules of 1969 (Rule 9) states that "natives whose ancestors have been, and who themselves are dependant on shifting cultivation in Sabah for subsistence, may without licence fell, burn or clear for the purpose of shifting cultivation forest of secondary growth on any State land which is not [already] the subject of a licence... Secondary growth for the purposes of this rule is defined as forest containing trees of not more than six years standing and not exceeding eighteen inches girth at four feet six inches from the ground, being of a kind that may readily be felled by means of implements for cutting of no greater efficiency or weight than an ordinary *parang*." To comply, farmers would have to keep fallow periods less than six years, and would not be lawfully entitled to open up old fallow for cultivation - all this, in spite of and on top of the regulations outlined in the Land Ordinance.

2.5.6. A hand to rock the cradle

The complexity of the law means that very little of these legal particularities trickle down to indigenous communities. In Kiau, people go about their annual routine with little apparent conflict or reprimand from government authorities (see chapter three). While they do acknowledge the authority of the law and do submit to governmental procedures, for them *adat* still retains its position as the main source of governance in the village often relying on the authority of their village headman to resolve disputes. And yet in no uncertain degree, they are faced with a problem. In the village, people are only concerned with aspects of legal procedures that are directly related to their lives, and very little overall knowledge of the system of government actually exists. A weak foundation in formal education, particularly among adults, also means there is a limited capacity for people to comprehend the change in the status of natural resources. The sanctity of their livelihoods rely on the congeniality of various government agencies to coordinate, communicate and cooperate, and as such, there is a growing dependency on government, as much as there is on politicians, to *provide* the stepping stones for their overall sustenance.

The centralisation of authority in state government has transformed the intangible, holistic and spiritual values indigenous people attribute to nature into representations of state law, modern technology and property. In this light, the environment is an exercise in production and extraction. The inalienable right to land and natural resources have been disregarded, and indigenous people now have to seek legitimisation from an external source[17]. An important and deliberate consequence of the Land Ordinance is the establishment of land as private property that can be laboured and traded for profit. Indeed, one of the explicit functions of the DLS is the eradication of "idle land" (Lam, 2002 pg. 22). Considering that fallows are misunderstood as idle land, farmers are therefore under immense pressure to reduce the fallow period and intensify agricultural productivity or else risk the loss of their land. In 1976 the Korperasi Pembangunan Desa (Rural Development Cooperation or KPD) was established to alleviate poverty in rural areas, whereby poverty is seen as resulting from "idle land not being utilised in the rural areas due to lack of awareness, technical know-how, market and capital... adherence to traditional agricultural practices and customs [that] continues to inhibit progress, and rapid logging activities [that] have adversely affected the traditional lifestyles primarily supported by shifting cultivation, fishing and hunting" (Gunting & Khoo, 1991 pp. 89-90). KPD ushered in a host of rural development programmes and provided a range of agricultural incentives, all of which were supported by the sustained high levels of government expenditure to advance the primary sector in Sabah (Gunting, 1989; Gunting & Khoo, 1991). While some of the projects focussed on

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[17] It is crucial to note that State Law does not preside over *Adat*, as they are parallel systems with *Adat* arbitrated through the Native Courts. The emergent conflict is a result of weak synergy between State Law (and in particular the Land Ordinance) and *Adat*, and a biased interpretation of both systems in favour of economic benefits over and above cultural heritage rights.

in-situ agricultural development (injecting funds, technology and perennial crops into existing land owned by subsistence farmers such as experienced in Kiau), other projects involved resettling entire communities into plantations (often the movement of fishing communities on to oil palm estates) and other rural development schemes (also King, 1993). The transformation of the subsistence sector was further encouraged by a number of government agency initiatives, both state and Federal, in addition to the involvement of private sector investors (Golingi & Ismail, 1988).

In 1988 the then Sabah state Minister of Agriculture and Fisheries, Datuk Joseph Kurup, earmarked the subsistence sector (farming and fishing communities) as sectors that deliver the lowest levels of productivity (Kurup, 1988). In response, he called for the transformation of the subsistence sector towards modern agricultural and fishery techniques, particularly by providing advice to farmers on what crops to grow and when to grow them. However, many such agricultural development programmes were implemented "as fast as possible", producing what Gunting and Khoo (1991 pp. 96-97) saw as "less-than satisfactory results achieved by KPD". From the outset, failures of rural development projects were blamed on the complacency and apathetic attitudes of subsistence farmers, and a preference for leisure and alcohol (Golingi & Ismail, 1988; Golingi & Chua, 1989). In response, recommendations to boost agricultural productivity included the push for education "to enable [subsistence farmers] to rationalise or change their attitude", the recruitment of foreign labour even in the case of *in-situ* projects, and a strict enforcement of the Land Ordinance "so that all unutilised land could be put to more productive use by rural development agencies" (Golingi & Chua, 1989 pp. 99-101). From legislation to government policy and practice, subsistence farmers are being convinced of the unprofitability of their livelihoods and ultimately persuaded to abandon swidden altogether. It was argued that these rural development initiatives and the spread of commerce would provide opportunities for an easier and more comfortable occupation that can better alleviate poverty (Gudgeon, 1981).

Additionally, I contend that political motivations to integrate rural communities into the wider development agenda has been one driving force behind these initiatives, whether it is the advancement of mainly Muslim fishing communities or the transformation of a large rural Kadazandusun agrarian population. Furthermore, the Federal directive to spur sustained economic growth nationwide coupled with a strict top-down planning and implementation process has left the illiterate subsistence swidden farmer at the mercy of rural development programmes that often disregard, and seek to disempower, the socio-cultural relationships between farmers and their land (Gunting, 1989; also Appell, 1989; Dove, 1996). In many cases, rural development programmes were imposed on a target group without any adequate

consideration whether a programme of such nature would be appropriate to the target group's socio-cultural context. There was also a failure to consider how the inherent shortage of labour (i.e. one farming household) could cope with the upkeep of additional crops over and above the already demanding requirements of their swidden activities. The denunciation of subsistence agriculture as an unproductive mode of production also overlooks a crucial aspect of traditional labour patterns that are task-oriented rather than time-oriented (Pugh-Kitingan, 1989). As it were, a concept of rural development that strictly adheres to increasing income generation and increasing labour hours represents a gross misconception of how swidden communities are linked to their natural environment. It is a misconception that forces a farmer to choose between abandoning a traditional lifestyle of poverty in favour of a modern lifestyle of commercial agriculture – a choice between lifestyles that in fact, as we shall see in Kiau, are not mutually exclusive in time or space (see chapter three).

It is important to reiterate that my portrayal of the development agenda is, by far, not a cut-and-dry proclamation about the decimation of indigenous culture. As I have discussed in section two, the political history of Sabah shows that control, whether over the political, economical or cultural legitimacy of the indigenous Kadazandusun population, has been a product of complex and ongoing negotiations between various factions in Sabah over and above the motivations of Federal Government. Indeed, writers such as Gunting and Golingi are themselves part of the Kadazan intelligentsia who were writing at the height of the PBS government. It is difficult to determine how much an urbane and educated Kadazan intelligentsia is able to relate to the practical reality of the much larger rural Dusun population, or how much the push for Kadazandusun cultural transformation interacts with the push for economic transformation of a rural subsistence sector. For Kadazandusun political legitimacy to consolidate, a united Kadazandusun people need to agree with each other, whether on the basis of cultural unity or economic progress. If such is the case for the rural development agenda of Kadazandusun people, it is rather fortunate that Kiau provides an argument to the contrary (see chapter three).

SECTION SIX: WILL TO CONSERVE

2.6.1. The conservation angle

Kinabalu Park has been catalytic in bringing about change in Kiau because it represents the other side of the centralised regulation of the environment. If the previous section was about regulating how people can extract benefits from natural resources, then the case of Kinabalu Park however, is about limiting how people can use natural resources. At present, the park is only 39 years old, coinciding remarkably with the era of self-government in Sabah. Throughout this

period, Kinabalu Park has been a crucible for many important local changes that happened to the Dusun people who live around it, whereupon a concept of total habitat protection was introduced to communities whose very sustenance depends on the utilisation of natural resources. Intriguingly, the gazettement and operation of Kinabalu Park incurred relatively little conflict with Dusun villagers located around the entire periphery of the park (Nais, 1996). Instead, villagers have been receptive of the direct and indirect benefits from Kinabalu Park, and over time, there has developed a gradual integration of local communities into the wider conservation agenda.

2.6.2. Gazettement

Even during the colonial administration, the British were intrigued by the mystery of Mount Kinabalu, which at the time was an area largely unexplored and undocumented by foreigners. The first documented ascent to the summit was made by (later Sir) Hugh Low in 1851, and thereafter followed a slew of scientific expeditions that proceeded to describe the immense botanical and zoological diversity of Kinabalu (see chapter three). In 1964, the mountain and forests surrounding it was gazetted as Kinabalu National Park (Liew, 1996). It was the first and only national park in Sabah until the Tunku Abdul Rahman Marine Park was established in 1974. In 1984 the Sabah State Parks Enactment declared national parks in Sabah to be vested under the management and authority of the Sabah Parks Board of Trustees, whereupon the land would be entitled for a period of 999 years free of all liabilities and encumbrances (Liew, 1996). The Parks Enactment also allowed for existing parks in Sabah to be reclassified as state parks whereupon the location and area of each park was to be measured and clearly demarcated. Kinabalu National Park was thus renamed Kinabalu Park, reaffirming its status as a state park (see Table 2.6.1).

Table 2.6.1. Parks in Sabah

Park	Year established	Area (sq. km)
Kinabalu Park	1964	753.37
Tunku Abdul Rahman Park	1974	49.29
Turtle Islands Park	1974	17.40
Pulau Tiga Park	1978	158.64
Tawau Hills Park	1979	279.72
Crocker Range Park	1984	1,399.1
Tun Sakaran Marine Park	2002 (proposed)	Not gazetted yet
Tun Mustapha Marine Park	2003 (proposed)	Not gazetted yet

Today, the management of parks in Sabah falls under the offices of Sabah Parks, which is governed by its Board of Trustees. The arms of administration also include the appointment of a Park Warden and a team of Park Rangers for each park. The parks system is targeted towards

the preservation of "the total environment and not an individual feature or species... for the total habitat protection (for its significant and unique features, as a gene pool and water catchment area), also for scientific research as a living laboratory and a showcase for nature education... [whereupon] recreation and tourism is provided as an avenue for the enjoyment of the parks and features contained in it" (Nais, 1996 pg. 9). The primary aim is "to ensure that its parks are maintained unimpaired in perpetuity" such that the preservation of the total habitat is enabled by letting "natural processes take place without outside interference or intervention" (Nais, 1996 pg. 18). Parks therefore prohibit any human incursion, intervention and extraction without prior licence from Sabah Parks. In effect, the gazettement of a park signifies the conclusion of all human activities, including cultivation, hunting, and gathering of forest products, previously conducted in that area.

2.6.3. The drive to conserve

Kinabalu has been regarded as a haven for naturalists and it continues to be studied intensively in all disciplines[18]. In terms of plant diversity, Sabah, and principally Mount Kinabalu, has been ranked as one of the six mega-diversity areas in the world, with more than 5,000 species per 10,000 sq. km. (Beaman & Beaman, 1998). Kinabalu is also included as one of the 234 primary centres of plant diversity in the world, and acknowledged as "by far the most important botanical site in Borneo" (Davis *et al.*, 1995 pg. 258). Knowledge about the flora of Mount Kinabalu is very young, but since the first enumeration by Otto Stapf in 1894 it has been a knowledge that has incrementally multiplied as a result of voluminous contributions from botanists the world over. Beaman and Beaman (1998 pg. 1) estimate the plant diversity of Kinabalu to contain up to 6,000 species covering over 200 families and about 1,000 genera, all within the relatively small area of the 753.37 sq. km. that make up Kinabalu Park. Kinabalu has a high proportion of plant endemism and the occurrence of many spectacular and rare species, including orchids, rhododendrons, *Rafflesia*, and pitcher plants. In 2000, UNESCO[19] designated Kinabalu as a World Natural Heritage site (Martin *et al.*, 2002). Sabah Parks maintains a strong research presence in Kinabalu Park, and is instrumental in encouraging an elaborate scientific study of Kinabalu's features by sustaining a wide network of local and international collaborators.

Protecting such high levels of diversity and endemism brings into being the dilemma of nature conservation. In the case of a fully protected area like Kinabalu, the intended area has to be clearly demarcated and its boundaries enforced, before any real impact to conservation can be secured. Surveying the boundaries of Kinabalu Park only started in 1984, that is twenty years

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[18] The term Kinabalu is used to refer to areas on and around the mountain regardless of whether it is inside or outside park boundaries. The term Kinabalu Park refers to the demarcated areas inside the park, or the operations of the park itself.

[19] United Nations Educational, Scientific and Cultural Organisation

after its gazettement, and proved to be considerably expensive taking many years to complete (Nais, 1996). In doing so, Sabah Parks had to face a certain degree of dissent in cases where the freshly streamlined boundary measurements conflicted with existing NCR claims over land. This was because the gazettement of the park in 1964 was done by specifying its coordinates on a map. Rangers then translated these coordinates into approximate boundary markings on the ground by using hand held compasses, and therefore a margin for error was inevitable. Thus an approximate boundary came to be in existence for a good twenty years, which was taken to be the definitive boundary by many villagers. In some villages, the areas outside this "approximate" boundary were then opened for cultivation and settlement. When the boundary was officially measured in 1984, it was found that there was indeed a significant discrepancy between the approximate boundary and the exact measurements, granted in some areas the situation is more aggravated than in others. For example, in a small section of the northeastern boundary, there were patches of cultivation and even parts of villages that fell inside the exact park boundary. Confused, there are villagers who have continued to dispute the validity of the newly measured "exact" boundaries, thereby becoming the main source of conflict between the local communities and the park (Nais, 1996).

Other villages like Kiau, however, benefited from the remeasuring activity. As it turned out in Kiau, the margin of error between the old approximate boundary and the new exact boundary meant that an area of about 150 hectares[20] was released from within Kinabalu Park. In effect, forested lands that had formerly been under the protection of Kinabalu Park now reverted back to State Country Land status and is open for entitlement. Duaneh Ladsou, the headman in Kiau at the time the release was made, has told me that the villagers were indeed happy to receive such a vast area back into their *kawasan kampung* (village area), and because it contained old secondary forest that bordered onto the exact boundary of Kinabalu Park, the village had, at the time, decided to leave the area undisturbed and set it aside for future use, should the need arise (see chapter three).

The park boundaries require a strict and sustained level of enforcement against human encroachment, poaching, gathering of forest products, logging, and cultivation (Davis *et al.*, 1995; Nais, 1996). Because the Dusun communities around Kinabalu form the *de facto* buffer zone to the park, a great deal of cooperation and communication is demanded from villagers, primarily through the offices of the village JKKK and through villagers under park employ. The level of respect accorded to park regulations does support the argument that villagers, in general, do not contest their customary rights to that area, and therefore have accepted the gazetted area as an area set aside for nature conservation. Inside the park, *in-situ* and *ex-situ* conservation is

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[20] This area has never been measured and this estimation is the one I have received from various villagers in Kiau

supported by an extensive body of local and international researchers and their associates, government agencies, various funding agencies, and a budding private tourism sector.

2.6.4. For generations to come?

As such, Kinabalu Park presents itself as having a secure foundation upon which nature conservation can be enacted. It is protected by legislation and government policy, staffed with a range of specialists and engages in intensive international collaborative research, and is buffered by a network of Dusun communities who act as gatekeepers to the park boundaries. In practice however, there are several problems. Kinabalu Park has been open to manipulation depending on the political whims of the ruling administration. As early as 1971, that is seven years after its initial gazettement, an area of roughly 25 sq. km. was degazetted from the south eastern corner of Kinabalu Park to make way for a copper mine (Burrough, 1978; Liew, 1996)[21]. When the mining operations ceased in 1998 it had already caused nearby rivers that villagers depend on for drinking water to be contaminated with heavy metals (Nais, 1996; also Pugh-Kitingan, 1989). To date, the fate of the excised area remains uncertain, even though an extensive masterplan has been compiled to develop the former mine into an elaborate ecotourism venture (Daily Express, 2003f).

A second excision was executed in 1984 of two scientifically significant areas. Bukit Hampuan, a site that was important for the study of ultramafic vegetation, was degazetted for development purposes only to have a large portion of it burnt during the fires of 1989 (Liew, 1996). The second area was the Pinosuk Plateau, an area to the south of Kinabalu Park that was the primary site where the Royal Society Expeditions (1961-1964) were concentrated, was degazetted to make way for the development of a dairy farm, an asparagus farm, rose and chrysanthemum farm, temperate fruit tree trails, erection of tourist accommodation facilities, and an 18-hole golf course (Liew, 1996; Nais, 1996). Nais (1996) argues that excisions are, perhaps, a threat that has diminished over recent years in light of better environmental awareness and public consciousness. Instead, politicians have turned their desires towards privatisation of park facilities, such as the commercial aspects of accommodation, transport, and tour packages, much to the protest of park management and public outcry. It was felt that privatisation of park facilities would "tarnish the morale, controllability and credibility of the parks areas as conservation areas. The struggle is still on whether or not to privatise the commercial functions of the park... and is fiercely debated at the present moment" (Nais, 1996 pg. 27). In 1998, two years after the publication of Nais's paper, the commercial facilities in Kinabalu Park, including accommodation, catering, transport, and licence over the mountain climb, were privatised to Kinabalu Gold Resorts, a company with high-level political connections. To date, that is in a

[21] To compensate for the excision, the Sabah state government incorporated an area of 93 sq. km of the Mt. Templar Forest Reserve, an area at the north of Kinabalu, into Kinabalu Park.

period of five years, the ownership and management of the privatisation contract has changed hands three times.

Clearly, the situation is not so simple. The disturbing history of profit motivated decisions in Kinabalu Park provide a platform whereby further excisions or privatisations could be conducted on the basis of precedence. The incursion of privatisation threatens to disrupt the interface between Kinabalu Park and local communities. The profiteering attitudes of private companies mean that villagers seeking employment (or other indirect benefits) no longer enjoy congenial employment opportunities, instead they have to compete with a new workforce that is imported by the company from its various connections in urban centres like Kota Kinabalu. The most recent changeover in the privatisation contract has particularly distressed the mountain guides in Kiau. Sopinggi Ladsou has told me that there have been clear indications that the new corporate management board would seek to retrench older guides because they are illiterate, poor English speakers, and unskilled in basic medical (e.g. first-aid) and rescue procedures, without taking into consideration that these elderly guides are the most knowledgeable about the summit climb and the forests around it. Any impetus to "import" a batch of "trained" guides from Kota Kinabalu to take over the mountain guiding profession would have devastating consequences for many a household in Kiau and nearby villages. Despite the global recognition of Kinabalu Park as a conservation success, the power of state government to determine the tenure of nature conservation has certainly seen some questionable outcomes.

Other threats take the form of human encroachment into the park, either for illegal logging, poaching, or unlawful extraction of rare and commercially valuable species such as orchids to sell in local markets or insects to be made into souvenir key chains. Swidden agriculture has also been cited as a threat, particularly in areas where cultivation has occurred inside park boundaries because of existing land disputes (also Davis *et al.*, 1995). In addition, farmers who were opening and burning swidden plots during the El Niño drought of 1997 and 1998 saw the inadvertent spread of the fires into the park, particularly when their plots were close to the park boundary.

2.6.5. Communities around the park

In 1996, Nais estimates that there are as many as 45 Dusun villages (including Kiau), with an estimated total population of 15,800 people who live along the periphery of Kinabalu Park (Nais, 1996 pg. 30). The more populated villages are located closer to rural townships like Ranau and Kota Belud or where sealed roads have been established. The majority of the villages are linked by gravel roads that are often subject to flooding and erosion. Almost all the villages depend on gravity feed systems for their water, and Nais estimates that less than 20% of these villages are

supplied with electricity. The villages comprise mainly of swidden farmers who depend on the staple crop of hill rice and other subsidiary food crops, and continue to rely on forest resources to supplement their domestic needs (see Box 2.6.1). Thus while the predominant land use pattern around Kinabalu Park is based on swidden agriculture, many villages have set aside land as communal resources such as the village settlement itself, a village reserve where land has been reserved for future assignments to families, and communal grazing areas, in addition to plots under NT (Doolittle, 2001; Nais, 1996).

Box 2.6.1. Local community reliance on forest resources (Source: Nais, 1996 pg. 30)

Dusun communities living around Kinabalu Park continue to rely on forest resources as a supplement to subsistence agriculture. Forest resources can be illustrated along six broad categories:

- Forest products for construction materials (e.g. timber, bamboo and rattan)
- Food plants (e.g. fruits, vegetables, animal fodder)
- Medicinal plants
- Firewood
- Handicrafts
- Hunting and freshwater fishing

2.6.5.1. Mutual respect

Given that communities such as Kiau have been living at the foot of Kinabalu for at least 150 years (see chapter three), the gazettment of Kinabalu Park some forty years ago is something relatively new. Upon gazettement these communities became the default buffer zone to Kinabalu Park, but far from being a source of conflict, the people and park interface has been very encouraging on both sides. Disputes have been settled through constructive persuasion and amicable compensation rather than any confrontational means. Although the park enforces its strict rules prohibiting any human incursion or utilisation of natural resources inside the park, it makes certain effort in ensuring that communities are integrated into conservation activities in a way that provides mutual benefits.

These local communities act as gatekeepers to the park boundaries that border their village areas, an attitude that is upheld with pride in all the communities I have visited around Kinabalu Park. Villagers in Nalumad and Melangkap Tomis have told me of incidences where a report made by them has resulted in immediate reaction by Park Rangers to investigate the suspected unlawful extraction of orchids from within the park. In Kiau, Gampat Soborong, the village headman, has told me that he would not authorise any outsiders to conduct alleged research activities, such as the study of small mammals or birds, in his village area or the areas bordering the park unless

the person could show him a permit issued by the park. In the absence of such a permit, these "researchers" are turned away, and subsequently reported to park authorities. This is one kind of mutual benefit, when permission is given only to research that has been legitimated by the park, that both the areas inside the park and the village forests remain protected from unscrupulous activities. There indeed seems to be a degree of pride in the authority and respect accorded to the role of villagers as guardians to the park, and in turn, widespread acceptance and satisfaction of the role of Kinabalu Park.

On the other hand, it is perhaps, rather presumptuous to assume that all villagers subscribe to the conservation agenda of Kinabalu Park. If we consider activities such as hunting, it is conceivable that wild game can still be lawfully hunted as soon as the unassuming animal steps outside of the park boundary. There have been cases where villagers from Lohan have been caught unlawfully extracting orchids from inside the park to sell to traders. The unlawful extraction and selling of biological samples has been known to occur in Kinabalu and Crocker Range Parks, and illustrates how an impoverished local community have used their intimate knowledge of the forests to try and earn an income, only to get caught in a legislative tangle.

2.6.5.2. Employment opportunities

At the time Kinabalu Park commenced its operations, it was considered to be in a fairly remote area with poor road access and unreliable communications and therefore, the majority of employees came from the surrounding communities (Nais, 1996). It remains the policy of Kinabalu Park to encourage the gainful employment of local communities to provide some direct benefits, and in turn, their employment would help spread the message of nature conservation back to their home villages (also APECO, 1998). For the villagers, it meant they could engage in wage labour with only a short commute to work and still remain within the vicinity of Kinabalu, their ancestral homeland. Today, many villages, particularly those closer to Kinabalu Park Headquarters (PHQ) such as Bundu Tuhan and Kiau, regard Kinabalu Park as an important source of wage labour. To a rapidly growing rural population employment as Park Rangers, field assistants, administrative clerks, drivers, cleaners, or waiters, provides an attractive alternative to the harsh rigors of swidden agriculture. I have found that the larger families in Kiau derive their combined income from agriculture and some form of wage labour, primarily park employment and an increasing number of opportunities in trade and tourism.

An often cited pride in Kiau is their historical reputation as gatekeepers to the mountain and their intimate knowledge of the mountain. In chapter three, we will see how many of the early expeditions to Mount Kinabalu have engaged the services of guides and porters from Kiau. This is a tradition that has continued, with each expedition taking on the services of guides and

porters from nearby villages, such as Kiau and Bundu Tuhan (Jenkins, 1996; Regis, 1996). Towards the late 1970s, the completion of visitor accommodation facilities at Laban Rata and Panar Laban (roughly 3,300 m a.s.l.) meant that the trail to the summit of Mount Kinabalu could be attempted by small busloads of local and foreign tourists alike (Burrough, 1978; Liew, 1996), and has proven to be the primary tourist attraction in Kinabalu. As a safety precaution, each party of climbers is required to obtain the services of a mountain guide to supervise and assist in the climb. The park does not employ the mountain guides, but acts as an intermediary in the collection of guide fees, taking guide reservations, and compiles the weekly roster for guides (APECO, 1998). With the privatisation of tourism services in Kinabalu Park, this intermediary role has been handed over from Sabah Parks to the successive private corporations. The policy of one mountain guide for every four climbers ensures that, given the 20,000 climbers each year, there is plenty of work to go around all year long for the guides. Today, mountain guides are all certified as green-badge guides by the Federal Ministry of Culture, Arts and Tourism (MOCAT) and are organised under MALIM, which is a Kiau-based organisation that is recognised by MOCAT (also APECO, 1998). The head of MALIM, Sopinggi Ladsou who is from Kiau, has told me there are 76 certified mountain guides in the association, of which 70 are from Kiau and the remainder are from Bundu Tuhan and Kinasaraban. It is an occupation that is highly respected and revered in Kiau, and reflects their proud history as the traditional gatekeepers to Mount Kinabalu. It is also an occupation that allows flexibility in the work schedule, because being a task-oriented job (i.e. taking people up and down the summit trail) the guides can organise their guiding days to fit with the rice cycle and other agricultural and domestic tasks (also APECO, 1998). On the job, guides find there is ample opportunity to learn new things from their visitors such as sharing plant knowledge and developing their English.

2.6.5.3. Tourism

Mount Kinabalu is perhaps, the primary tourist destination in Sabah for both domestic and international visitors alike. Even though Kinabalu Park has been in existence far longer than any global initiative to define best practices in tourism, it was found that the tourism management and operation of Kinabalu Park is in line with the 1982 Kathmandu Declaration on Mountain Activities and the Charter for Sustainable Tourism adopted by the 1995 Sustainable Tourism World Conference organised by the World Trade Organisation (APECO, 1998). In 1982, the completion of the Kota Kinabalu – Sandakan highway meant that Kinabalu Park is now less than two hours drive from the state capital, where visitors can escape to the temperate weather, attempt the summit climb, or just enjoy the network of jungle treks and the array of tourist facilities. In 1994, Kinabalu Park was the most visited park in Malaysia, with the highest ratio of Malaysian to foreign visitors thus representing a tourist destination that is popular with locals as well (APECO, 1998). Approximately 200,000 people visit Kinabalu Park each year, and today the

tourism overflow can be seen for almost the entire stretch of the highway running from Bundu Tuhan to Kundasang being built up with privately-owned tourist resorts and recreational facilities.

The tourism boom around Kinabalu has affected local people in many ways. First, it has inflated the value of land, motivating several cases where local people have sold or sub-leased their land for the building of tourist facilities and shops. Second, there is a growing market for local produce such as handicrafts, vegetables, fruits, and other non-timber forest products such as honey. However, it also means that shops and stalls are able to sell products from other areas such as the factory made handicrafts from Kudat, and bird's nests from the Gomantong Caves located near the Kinabatangan River in the eastern part of Sabah. Indeed, my own experience of the local market at Nabalu (about 30 minutes drive from PHQ) over the last four years has shown an increasing array of imported handicrafts either from local factories or from factories in the Philippines, at the expense of locally derived produce from the Kinabalu area. Third, tourism provides an attractive opportunity for villagers to engage in wage labour either in Kinabalu Park itself or with private tourism ventures.

Over the last ten years in Kiau, they have developed their own community-based tourism venture where they built a small guesthouse that caters to the needs of at least two foreign tour companies from Australia and Denmark. Almost every weekend, a party of about ten foreign tourists will arrive in Kiau (Daily Express, 2003d). Sopinggi Ladsou, who is also the catalyst in the Kiau-based tour operations, has told me that the package includes one night stay at the guesthouse, meals catered by the villagers, and a tour of the village area. On the following day, the Kiau mountain guides will escort the visitors to PHQ and up the summit trail. Although the tour operations in Kiau have not yet been officially recognised by the state authorities, they have been receiving foreign tourists for the last ten years, and it has proven to be a substantial source of income to the villagers. Recently, a rival operation has surfaced in Kiau, where one family has opened up a jungle camp concept for tourist visitation. Visitor groups, including a party from the Sabah Society, get to stay in their home and experience a similar package of village tours including camping in the nearby forests. Competition for the tourist market is stepping up causing interesting tensions and potential conflicts within the Kiau community (see chapter three).

Tourism has presented a different perception of the surrounding natural environment, one that has introduced recreational activities as a potentially lucrative source of income. To a village like Kiau, which (including the gravel road into the village centre) is less than an hour's drive from PHQ and has a reasonably vast area of old secondary forest bordering Kinabalu Park, there is

indeed encouraging tourism potential. Their knowledge of the mountain and its forests have made them desirable candidates for employment in tourism, where Kiau-based community-owned tourism ventures have developed as a matter of course. As a result, the agricultural sector in Kiau is experiencing a growing "brain drain" of people who choose to work in tourism rather than on farming, and in turn, a growing influx of monetary returns that stratifies the community by income.

2.6.5.4. Participatory research

The significance of indigenous communities and their potential contribution to biodiversity research has been recognised by the Convention on Biological Diversity (CBD) 1993, where article 8 (j) calls for the need to "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles' as part of wider efforts to promote sustainable use and biodiversity conservation". The 1992 Earth Summit held in Rio de Janerio resulted in the declaration of Agenda 21, where Chapter 26 articulates that "in view of the inter-relationship between the natural environment and its sustainable development and the cultural, social, economic and physical well-being of indigenous people, national and international efforts to implement environmentally sound and sustainable development should recognize, accommodate, promote and strengthen the role of indigenous people and their communities." There is a growing body of literature calling for the involvement of indigenous communities in biodiversity research, in a way that provides for the equitable dissemination of benefits and the protection of indigenous peoples' rights over their traditional ecological knowledge (Laird, 2002).

To this end, and because of Sabah Parks' in-grown initiative to incorporate local people into its conservation agenda, there has been an encouraging history of integrating local communities living around Kinabalu Park in research activities, by virtue of their status as the default buffer to the park, the impact of swidden agriculture, and their rich knowledge of the surrounding forests. Any effort to conduct biodiversity research or conservation in areas outside Kinabalu Park cannot avoid involving local communities because they are the inhabitants and resource users in those areas. In general, most cases in Kinabalu Park continue to involve local people as *ad hoc* guides, porters or field assistants, although there is an increasing momentum to develop community-based and community-controlled biodiversity conservation projects.

Rafflesia conservation

Towards the early 1990s, Sabah Parks initiated a *Rafflesia* Conservation Scheme that involved local community conservation of *Rafflesias*. Nais (1996) noted that clearing land for swidden agriculture was a major threat to *Rafflesias* occurring outside park boundaries (also Nais, 2001).

Thus once a *Rafflesia* was known to occur on land claimed by local farmers, the Scheme was introduced to provide local people with the skills and technical knowledge to conserve this habitat, and to open it for tourist visitation (Nais & Wilcock, 1998). It was a successful attempt at introducing community-based plant conservation techniques, as the income generated from opening the *Rafflesia* site for tourists proved to be more profitable than opening the land for swidden agriculture. I received information of the Kokob site that recorded up to RM1, 000 for one month's worth of tourist entrance fees when a *Rafflesia* was in bloom.

Projek Etnobotani Kinabalu

A significant endeavour to include local people was the Projek Etnobotani Kinabalu (PEK), which started in 1992 as a collaborative effort between Sabah Parks, University of Malaysia Sarawak (UNIMAS), and the People and Plants Initiative (also a joint effort involving UNESCO, WWF and the Royal Botanic Gardens at Kew) (Beaman & Beaman, 1998; Martin *et al.*, 2002; Nais, 1996). The PEK was an ambitious attempt to conduct a community-based ethnofloristic inventory of Kinabalu by tapping into the rich ecological knowledge of Dusun communities. It trained a team of Dusun villagers in basic plant collection techniques, and set up collection centres in nine villages (later extended to include Mantanau in the north) located around Kinabalu Park (see Figure 2.6.1).

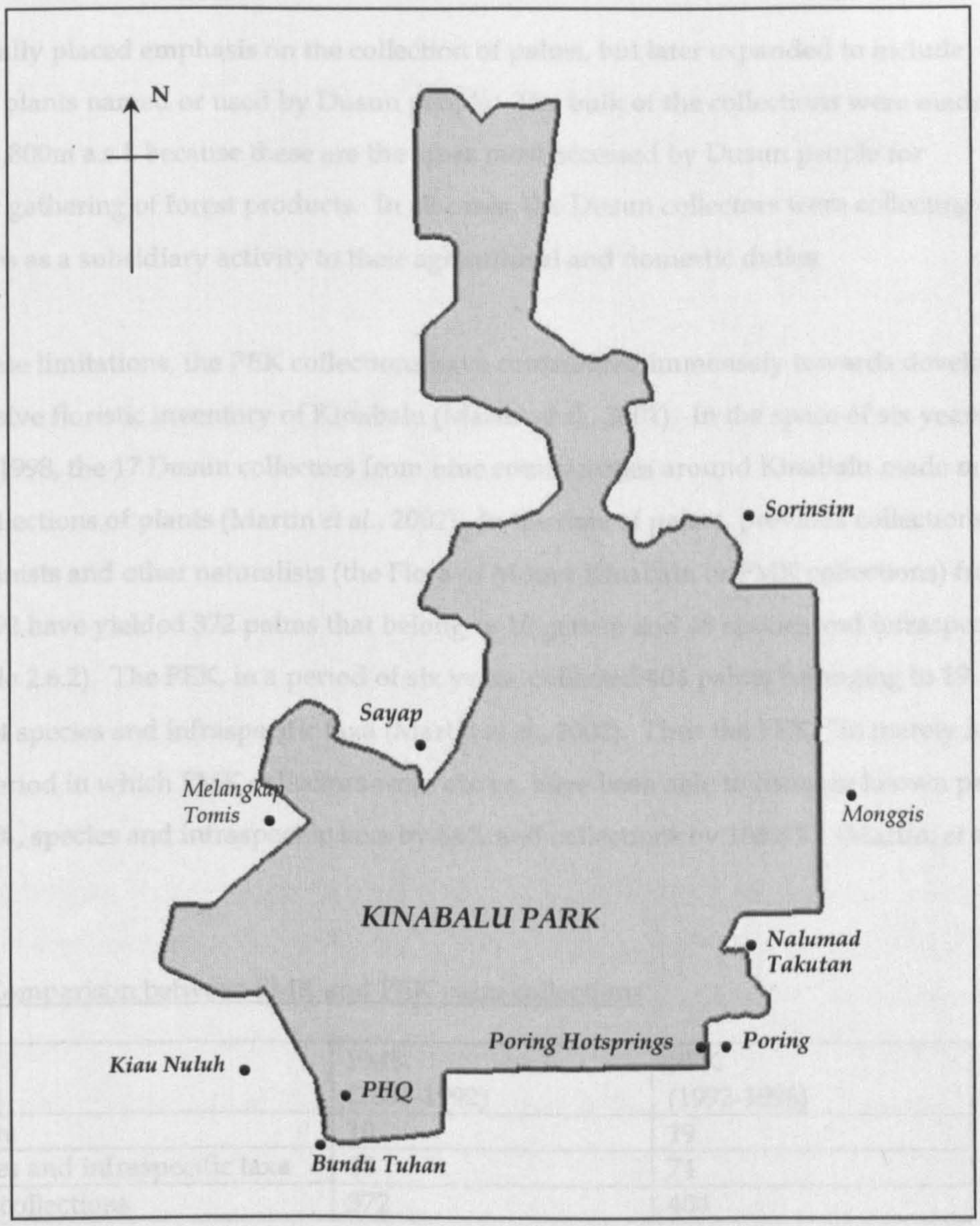

Figure 2.6.1. Dusun villages that participated in the PEK (not to scale)

Each member of the team was responsible for collecting voucher specimens of useful plants in their village areas, and collectors were also provided with licences to collect useful plants from inside the park boundary. In addition to the volumes of voucher specimens they accumulated, the collectors also recorded the local plant names, distribution, management, and interviewed other members of their village to document the uses of these plants. Collectors were paid a small fee for every voucher specimen they collected. The voucher specimens were sent to the University Kebangsaan Malaysia (UKM), Royal Botanic Gardens at Kew, and other collaborating institutions for scientific identification, and a duplicate specimen is kept in Kinabalu Park. As a result, the PEK developed an impressive central database of ethnobotanical information about plants in Kinabalu.

The PEK initially placed emphasis on the collection of palms, but later expanded to include collections of plants named or used by Dusun people. The bulk of the collections were made in areas below 1,800m a.s.l. because these are the areas most accessed by Dusun people for cultivation or gathering of forest products. In all cases, the Dusun collectors were collecting on a part-time basis as a subsidiary activity to their agricultural and domestic duties.

In spite of these limitations, the PEK collections have contributed immensely towards developing a comprehensive floristic inventory of Kinabalu (Martin *et al.*, 2001). In the space of six years, from 1992 to 1998, the 17 Dusun collectors from nine communities around Kinabalu made more than 9,000 collections of plants (Martin *et al.*, 2002). In the case of palms, previous collections made by botanists and other naturalists (the Flora of Mount Kinabalu or FMK collections) from 1856 until 1992 have yielded 372 palms that belong to 10 genera and 48 species and infraspecific taxa (see Table 2.6.2). The PEK, in a period of six years, collected 404 palms belonging to 19 genera and 74 species and infraspecific taxa (Martin *et al.*, 2002). Thus the PEK, "in merely 3.3% of the time period in which FMK collectors were active, have been able to increase known palm genera by 90%, species and infraspecific taxa by 54% and collections by 108.6%" (Martin, *et al.*, 2002).

Table 2.6.2. Comparison between FMK and PEK palm collections

	FMK (1856-1992)	PEK (1992-1996)
Genera	10	19
Species and infraspecific taxa	48	74
Total collections	372	404

In the case of monocotyledons, the PEK contained collections of all the 35 monocotyledonous families currently known to Kinabalu, and added new records for 7 families, 29 genera and 112 species (Beaman & Beaman, 1998) (see Table 2.6.3). Even though Sabah Parks dissuaded PEK collectors from collecting orchids, they nonetheless made 147 collections of Orchidaceae, including 41 genera and 87 species. Of these, one genus and 14 species were new records for Kinabalu (Martin, *et al.*, 2002).

Table 2.6.3. Comparison between FMK and PEK monocotyledon collections (Source: Martin, et al, 2002)

	FMK (1856-1992)	PEK (1992-1996)	New records in PEK collections	Percentage of increase due to PEK[22]
Families (excluding orchids)	27	27	7	25.9%
Genera	134	116	28	20.7%
Species and infraspecific taxa	353	241	99	28.0%

John Beaman and his colleagues are currently completing an enumeration of dicotyledonous families that will hopefully finish by the end of this year, where analysis of the remaining PEK collections is part of this process.

To a degree, the success of visiting botanists in making collections can be attributed to their accompanying Dusun guides and assistants (Martin *et al.*, 2002). The PEK collections however, independently reaffirm the elaborate and detailed knowledge Dusun people have about their surrounding environment, and reflect the breath and depth of knowledge about plant uses. Martin *et al.* (2002 pp. 15-16) state "we attribute the productivity of the PEK collecting of palms and other plants to the Dusun people's intimate knowledge of the living organisms, localities and microenvironments around Mount Kinabalu, their ability to collect at a variety of locations year round and their tendency to collect a range of cultivated, semi-cultivated and wild species... [W]e hypothesize that a comprehensive collection could be developed if local collectors are encouraged to obtain specimens of the flora at higher elevations and if they increased the scope of their collecting to include species regardless of whether or not they are named or used by Dusun people."

My own initial work in Kinabalu was targeted at compiling a selection from the PEK results into a community plant manual that would be distributed to villagers living around Kinabalu Park. The underlying rationale was that PEK data embodied a collection of indigenous plant knowledge, and therefore access to this databank of indigenous knowledge should be granted to the very communities from whence this knowledge came. As such, the entire process involved a continued period of consultation with community members to collect ethnobotanical information from twenty Dusun villages around the park, using the PEK database as a main reference point (see chapter four). The end result was a booklet describing the names and uses of forty plants, and copies of the booklet were distributed to all the villages that participated in the process (Agama and Juanih, 1998; Martin *et al.*, 2002). To prevent any misuse of this booklet, and to uphold their intellectual property rights over the knowledge contained within, these

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22 Where percentage of increase represents the contribution of new records in the PEK to the existing records known under FMK

communities also compiled a protocol document that governed the access and use of the booklet (Agama cited in Laird *et al.*, 2002) (see Box 2.6.2).

Box 2.6.2. Plant manual protocol document

Buuk nopo ti nga' tua' di pininggisaman mantad kampung-kampung:
Buku ini adalah hasil dari kampung-kampung:
This book is the result of joint efforts by the following villages:
Kiau Bersatu, Kiau Nuluh, Kiau Toburi, Mantanau, Melangkap Baru, Melangkap Kapa, Melangkap Nariou, Melangkap Tiong, Melangkap Tomis, Monggis, Nalumad, Pinawantai, Takutan, Toruntungon, & Ulu Kukut.

1. **Pogoduhan do popodual buuk diti;**
   Dilarang menjual buku ini;
   Sale of this book is prohibited;
2. **Pogoduhan do popintahak buuk diti kumaa tulun do suai;**
   Dilarang mengedar buku ini kepada pihak lain;
   Distribution of this book to any other party than those cited above is prohibited;
3. **Pogoduhan do poposurat kawagu nunu nopo id suang buuk diti, toi ko' poposurat id suang database komputer;**
   Dilarang menerbitkan sebarang maklumat, atau memasukkan ke dalam database komputer;
   Publication of information contained within this book, or inclusion in a database is prohibited;
4. **Pogoduahan do momoguno toilaan id suang buuk diti di maan do pongindapuan;**
   Dilarang menggunakan maklumat dari buku ini untuk tujuan perniagaan;
   Under no circumstances is the information contained in this book to be used for commercial purposes;
5. **Pogoduhan do momoguno om popinwangkar toilaan nokosurat id suang buuk diti poinkuro pia kowaya-wayaon nung aiso kasaga'an mantad id AJK;**
   Dilarang menggunakan dan mengedar maklumat dari buku ini dalam bentuk lain yang tidak diluluskan oleh AJK;
   Any use or distribution of the information contained in this book in ways not approved by the Committee is prohibited;
6. **Ontokon om adaton isai nopo i adapatan amu' mamayaan dilo' kapantangan-kapantangan di nokosurat.**
   Tindakan atau denda akan dikenakan pada sesiapa yang didapati melanggar peraturan-peraturan yang dinyatakan.
   Anyone found disregarding the stated regulations shall be penalised.

_____	_____
tandatangan penerima *signature of recepient* tarikh: *date*	tandatangan dan cop AJK *signature and stamp of Committee* tarikh: *date*

Villagers have told me that they feel the booklet was an important step towards documenting their plant knowledge, which they felt was gradually being forgotten. It provided a useful reference point for both adults and children, and has generated considerable interest in traditional plant remedies. Gitas Matigal from Mantanau told me that other neighbouring Dusun villages had heard of the project and have asked to be included in the circulation of the booklet. In villages like Melangkap Baru, the community has jointly decided that they would share the booklet with another nearby Dusun village. The villagers I have spoken to expressed a

great deal of confidence in the protocol document as a mechanism through which the community itself can establish authority and exert control over research results.

The PEK provides a case in point where tremendous achievements in biodiversity related research can be attained through collaboration between scientific and indigenous ecological knowledge. The PEK has been an invaluable partner in compiling the floristic inventory of Kinabalu, and in turn, the results of the floristic inventory will be returned to local communities in the form of a *Dusun Ethnoflora* as an "incentive to local communities to manage unprotected forests in buffer zones around Kinabalu Park and to promote the viability of Dusun ecological knowledge" (Martin *et al.*, 2002). This sustained process of reciprocal exchange has nurtured a positive and productive partnership between Kinabalu Park and many of the communities around it, providing an opportunity for local people to contribute towards, and benefit from, biodiversity research.

2.6.6. A base in the community

More recently, the areas around Kinabalu have been subjected to the increasing interests of non-government organisations (NGOs) who have initiated thematic community-based activities. The PEK to a small degree introduced the involvement of the World Wide Fund for Nature Malaysia (WWFM) and PACOS as agencies working on biodiversity and indigenous knowledge issues. In Kiau, WWFM expanded its involvement by supporting community-based conservation activities such as the establishment of a *kebun etnobotani* (ethnobotanical garden) where useful plants could be transplanted for community use and education. In this process of capacity building for conservation, villagers have participated in workshops to discuss forest and plant conservation issues, and in practical training sessions organised by PACOS. As a result, concepts such as buffer zone management, intellectual property rights, and *lanunan hayat* (biopiracy), have become conversation pieces tossed around by villagers themselves as casually as though they were normal elements of community life.

The penetration of NGOs like WWFM and PACOS has certainly introduced an additional element in the community relationship with the natural environment. Formerly, the perception was that forests outside of Kinabalu Park were under the stewardship of villagers who, with mutual consent and joint understanding, could open it up for cultivation, residence, or use it for communal purposes such as grazing and recreation. With these NGOs however, came the concept that natural resource use is linked to much wider regional and global issues such as biopiracy and climate change. Villagers are confronted with the idea that harvesting bamboo, or any such activities to do with the natural world, is interlinked with the survival of our whole planet and its peoples. Furthermore, the "loss" of indigenous ecological knowledge, they have

been told, is a global phenomenon that reflects the disappearance of indigenous cultures. It is, if anything, an overwhelming revelation.

In Kiau, this has led to an immense awareness of the need to safeguard indigenous knowledge and the interests of the community, thus their subsequent participation in a PACOS-led initiative (1998 to 2000) to draft, and ratify, a Community Protocol on Bioprospecting (Makitaak, 2001c) (see Box 2.6.3).

Box 2.6.3. Community Protocol on bioprospecting (Source: Makitaak, 2001 pg. 6)

The Community Protocol on Bioprospecting is written in Bahasa Malaysia. The English translation reads:

Anyone who undertakes any kind of research must:

1. Provide early notification to the community through the Village Development and Security Committee (JKKK), Village Head or Chairman of the Peoples' Organisation;

2. Obtain permission from the District Officer and/or other government bodies (e.g. University, Sabah Parks, Forest Department, Wildlife Department or Economic Planning Unit);

3. Inform and obtain agreement from the community through village meetings using means that can be easily understood by the community, concerning:
   a. Objectives and target of the research
   b. Background of the researcher and organisation/s funding the research
   c. Workplan or activities that will be carried out
   d. Benefit of the research to the community
   e. Risk of the research to the community, and
   f. Impact of the research to the community

4. Draft an agreement that the community can study before reaching an agreement;

5. After the agreement is signed, inform the community at least two weeks in advance before entering the area;

6. Respect the traditional customs, beliefs and culture of the community;

7. Provide regular reports during the research period that enables at least one elected member of the community to follow closely the progress of the research;

8. Adhere to additional rules decided upon by the community if biological specimens are to be taken;

9. Sign a written agreement that underlines the benefit of the research to the community (not necessarily in monetary form but can be in the form of support for the needs of the community, recognition of land rights or others); and

10. Agree to this protocol including payment of compensation (*sogit*) that the community decides on if the rules therein are breached.

The drive towards nature conservation in Kiau has spurred the formation of GOMPITO[23] in 2000, a Kiau-based and community-controlled village organisation, which took over the coordination of plant conservation and nature education activities in Kiau. GOMPITO became an officially registered organisation in 2001, and has recently attracted the attention of the UNDP GEF[24] Small Grants Programme. GOMPITO has already initiated a planning phase with some funds from GEF to develop a two-year project that addresses the biodiversity conservation and sustainable natural resource management of the forest areas recently excised from Kinabalu Park. My own observations and interactions with GEF representatives indicate that GOMPITO will most likely succeed in obtaining full funding to conduct this project, which represents a tremendous effort on the part of the Kiau Dusun community to integrate traditional knowledge and practices with scientific techniques. The presence of a UNDP GEF project in Kiau will have a strong impact on further encouraging local community participation in biodiversity conservation, again reiterating the significance of these Dusun villages as the default buffer zone to Kinabalu Park, a World Heritage Site.

2.6.7. The will to conserve

Conservation, with all its connotations of habitat and species protection, biodiversity-related research, indigenous ecological knowledge preservation, and sustainable resource management, has brought into being a *different* way of *thinking* and speaking about the natural environment. For the Kiau Dusun, the establishment of Kinabalu Park has restricted access to areas inside the park, but at the same time, it has catalysed local community participation in biodiversity research, conservation, tourism, and the cash economy. It has also brought about a whole new language for speaking about traditional plant knowledge where bioprospecting protocols seek to protect the intellectual property rights of indigenous communities over the very same indigenous knowledge that is exploited by way of biopiracy. Here is an international agenda that is replete with the politics of globalisation and the intricacies of numerous overlapping international conventions that pound with astounding momentum onto small-scale indigenous communities. Indeed, a whole global movement has arrived at Kiau's doorstep. Much to my interest, Kiau has not contracted with fear nor erected barricades of retaliation. Instead, they have expressed a curiosity to know more and been open to new ideas. They have allowed

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[23] GOMPITO stands for *Momogompi Monigolig Sinakagon Tokou*, which literally translated, means to guard and protect the heritage of our community. GOMPITO was formed by a group of about thirty male and female community members in Kiau Nuluh and Kiau Bersatu who felt they had a vested interest in cultural and environmental preservation. The organisation works in collaboration with the village JKKK and seeks advice from the *Ketua Kampungs* and other village elders to guide their work.

[24] United Nations Development Programme Global Environmental Facility

themselves to participate in activities that they believe to generate genuine benefits for their community, and in turn, are debating how the message of conservation is relevant to their needs.

SECTION SEVEN: A TRADITION OF CHANGE

2.7.1. Incorporation

This chapter is an important step in exploring the forces of change that have the potential in shaping Kiau Dusun attitudes and perceptions of their natural environment. From the Kiau Dusun point of view, they have been recipients of many top-down changes such as the incorporation of Sabah into Malaysia and the era of self-government in Sabah. The Kiau Dusuns have had to listen to the rallying call of the Kadazans, an urban and educated elite who themselves are embroiled in a power struggle with the political motivations of a Malay Federal Government. To this end, the Kiau Dusuns received two important cultural tools: a standardised Kadazandusun language and a merged Kadazandusun identity that will assist them in identifying with the larger struggle for Kadazandusun political legitimacy. It is a rallying call that is based on loyalty to perceived Kadazan and Dusun cultural similarities that, therefore, has involved a substantial degree of ongoing cultural reconstruction. In return for their loyalty, the emergent Kadazandusun political legitimacy promises to bring about Kiau Dusun modernisation through agricultural subsidies, education and government scholarships, employment and overall economic progress. And so, the Kiau Dusun are to decide who they really are and how they fit into the politics of Kadazandusunism.

A crucial part of this process has been the emphasis on agricultural transformation (also King, 1993; Padoch & Peluso, 1996). As a subsistence agrarian community, the Kiau Dusun are recipients of explicit and implicit pressures to change their agricultural basis. It was an attempt at transforming a rural population based on a gross misconceptualisation of rural development. It introduced the commoditisation of natural resources (whether land or crops) without the back-up of a local level socio-cultural framework that could support this shift in production. As we shall see in chapter three, the Kiau Dusun have absorbed this call for agricultural transformation only in so much as fits with their existing socio-cultural framework, and therefore have remained largely as subsistence farmers.

At the same time however, the establishment and operation of Kinabalu Park has made the Kiau Dusuns recipients of another form of natural resource transformation: conservation. Kinabalu Park brought about the integration of Kiau Dusuns (whether through employment, tourism or research) that could be pursued without invalidating the socio-cultural relations between the

Kiau Dusun community and their agricultural system. The conservation and research efforts of Kinabalu Park have sought to support indigenous knowledge and customary practices while at the same time introducing opportunities to participate in the cash economy. In this context, GOMPITO is a grassroots movement within a wider conservation agenda that produces, in turn, a home-grown and explicit exploration of what is traditional and what is modern in present day Kiau perceptions and practices.

In this light, the development agenda of self-government is by no means a homogenous journey towards an Appellian (1989) sense of "economic fundamentalism" (see section 2.1.1). On the contrary, the development agenda has presented the Kiau Dusuns with a pathway of choices. These choices, in turn, are reflected in the very composition of Kiau itself, whether it is in the knowledge, attitudes or practices found in the village today. In this sense, what is traditional about Kiau is very much connected with what is modern in the community, where the surviving aspects of a temporal past have been, and continue to be, reworked and even reinvented so that it fits with contemporary needs. Chapter three is the next and crucial step in exploring the nature of change in Kiau, starting with accounts dating as far back as 1851, that is more than 100 years before the era of self-government. The localised changes I describe in chapter three provide the crucial link between transformations within the Kiau Dusun community and the transformation of their social and cultural perceptions of Mount Kinabalu. From the perspective of the wider and "imposing" changes described in this chapter and the local "internalised" changes described in the following chapter, we shall see how the Kiau Dusuns both adapt to, and initiate, change. It is through this complex multifaceted interaction that a salient body of Kiau Dusun indigenous knowledge is similarly tapered, revised, revitalised, and sculpted, as the very basis of their survival as a community in itself and as members of the wider Kadazandusun ethnic group.

CHAPTER THREE: TRANSITION

SECTION ONE: THE ROCK

3.1.1. A mountain of change

I had the occasion of taking a handful of people from Kiau Nuluh and other villages around Kinabalu on a trip to Sandakan on the east coast of Sabah. Despite their genuine enjoyment of the excursion and excitement of seeing a new place, their resolute and unanimous declaration was this: if they cannot see Mount Kinabalu (see Plate 3.1.1) when they wake in the morning they know they are in a foreign place and they want to go home. Of the villages I have visited around Kinabalu, each village lays claim to *their* view of the mountain and *their* part of the mountain, as though it is the security of this big granite rock that is the solid fixture of being truly at home.

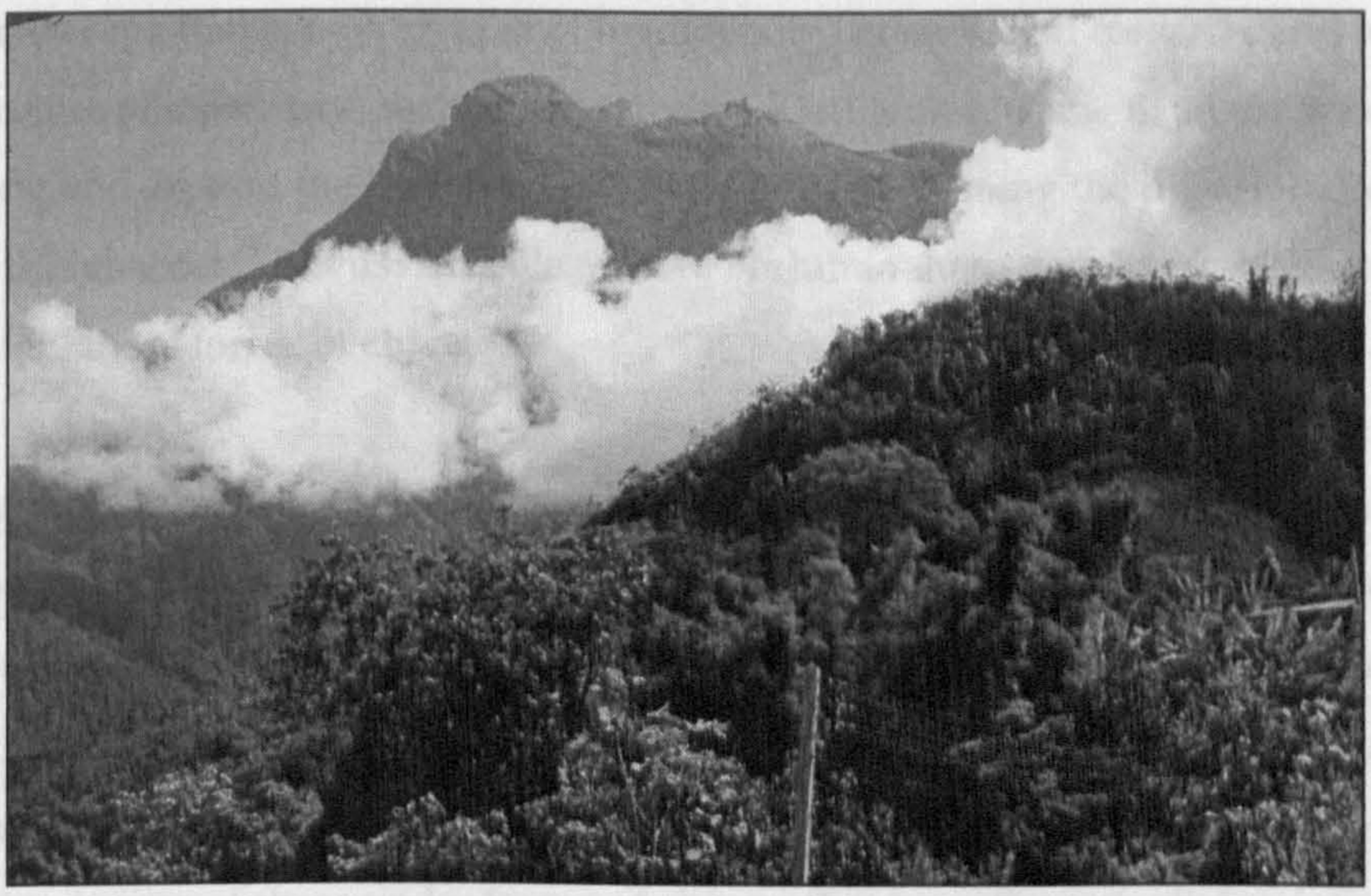

Plate 3.1.1. Mount Kinabalu seen from Kiau Nuluh

There are several explanations as to the origins of the name "Kinabalu", the more popularly cited account being the one that emphasises a Chinese influence, as in the legend of the Chinese (*kina*) widow (*balu*) (Regis, 1996). A more likely explanation rests in the traditional perception, among Dusun communities living around Kinabalu, of the mountain as the resting place of the dead. The Dusun word "*nabalu*" means "any big boulder" which is the dwelling place of spirits (Regis, 1996 pg. 35; also Beaman *et al.*, 1996; Pugh-Kitingan, 1989; Yap, 1985). The prefix "*Ki*" means the occurrence of boulders, thus completing the name "*Kinabalu*" (also Whitehead, 1991 pg. 192). And so, while the forests of Kinabalu have been granted the traverse and subsistence of its peoples, the lofty peaks remain the domain of the mystical. In past centuries, many believed the

peaks harboured a magical lake, while some believed there to be deposits of valuable minerals and precious stones guarded by a ferocious dragon (Daily Express, 2003b). Others still, believed the mythical *lagundi* tree to grow at the summit of Kinabalu whose fruit would restore youth for eternity (St. John, 1986).

For the people of Kiau, who live at the foothills of Mount Kinabalu, the mountain is a looming fixture in both their physical and cultural landscapes. In chapter two I discussed the significant forces of change that continue to revolve around the magnetism of this mountain, specifically for the cases for biodiversity conservation and tourism. As early as 1851 we learn that Kiau became the central transit point for all expeditions to Kinabalu, some travellers making it all the way to the summit plateau while others were (or had to be) content with foraging within the forested foothills. Even after the opening of a new summit pass at Tinompok in 1923, the people of Kiau have continued to serve as mountain guides and field assistants to expeditions and the growing number of recreational visitors. By 1964 Mount Kinabalu and the surrounding area was declared a fully protected area that is now an area of biodiversity conservation research, and tourism, of global importance (chapter two, section six). Today, Kiau Nuluh is one in a number of villages scattered along and around the periphery of Kinabalu Park, forming the default buffer zone to the park. In this chapter, I discuss the role of Kiau Nuluh in these developments as catalyst of, and recipient to, these forces of change.

As I have argued, Kiau Dusun plant knowledge is context-bound to reality, the main thrust being that plant-concepts and thus the knowledge founded upon such conceptualisations reflect the normative reality of Kiau Nuluh. Indeed, the data I present in chapter four reveal that Kiau Dusun plant knowledge is distributed according to particular social and economic variables; variables that characterise and reflect trends in both the wider and localised human ecology. I have highlighted some of these wider forces of change that have the potential to influence the local communities, including a history of ethnic diversity coupled with the political manoeuvring of identity building, linguistic contact with the use of Bahasa Malaysia and English, the role of the state and *adat* in the privatisation of land tenure, and the growing conservationist agenda around Kinabalu. The main point is that the normative reality of the Kiau Dusun is not, and quite possibly has never been, constant. Rather, history has shown us that change is, perhaps, the only constant. In this chapter I discuss changes at the village level, specifically, by looking at Kiau Nuluh from a historical perspective. I believe that an appreciation of the ongoing cultural fluidity of the Kiau Dusuns is an essential resource for contextualising the variations in their plant knowledge patterns. Any attempts to analyse the plant knowledge patterns in Kiau Nuluh hinge upon understanding the elements of change that have influenced different parts of the community in different ways. Furthermore, exploring the variations in plant knowledge within

a historical and cultural context is crucial for enabling the community to identify with, and relate reasons for, the status of their indigenous plant knowledge, and therefore, enable them to understand how their historical and cultural development impacts upon, and is shaped by, variations in their knowledge.

In this chapter, I rely on my own field experience to describe the present day situation in Kiau Nuluh 2003: they are embedded in the intricacies of the Sabah state administration and the rippling politics of ethnicity; they feel the implications of mainstream social integration by way of cultural identity building, language standardisation, and religious loyalties; they are part of the wider market economy and have their own tourism ventures; they actively encourage wage labour and formal education as key agendas to their younger generations. It is a web of social, cultural, economic and political elements that continue to change over time and space.

Fortunately[1], because Kiau Nuluh was the central transit point to Mount Kinabalu, I have found that the Kiau Dusuns have been described, over the years and to varying degrees, by the numerous expeditions they have guided up the mountain – starting with the first documented ascent of the mountain in 1851. Thus in the next section, I use these historical observations in combination with information from oral histories to capture the dynamism of Kiau Nuluh's past, and also to provide a basis for charting the social developments that lead up to the atmosphere in Kiau Nuluh today. Kiau of the past, as we shall see, was just about as dynamic as the Kiau Nuluh we have today. Thus while the architecture of change is dynamic in the nature of its content, it is nevertheless perpetual in its force. It is a process that is entwined with the history of social groups, and much like that solid granite fixture, change is an integral characteristic of the social and cultural constitution in Kiau Nuluh.

SECTION TWO: CONVERGENCE

3.2.1. Allure

Sitting on a boat off the coast of Kota Kinabalu, I am in full view of Mount Kinabalu rising abruptly from the depths of the forested valleys, whose distant peaks are cloaked in a movement of cloud and mist. I can only imagine how powerful the allure of this mountain, her bare granite shoulders gracefully giving way to a cascade of lush green valleys below, could have been to explorers of past centuries. And there, in 1851, were the Kiau Dusuns - living on the southern spur of Kinabalu and controlling access to the only known path to the summit plateau of a

[1] Fortunate for this dissertation and not much to do with the fortunes of change.

mountain that, over a period of more than 150 years, has persisted as "a Mecca to biologists of the present day" (Gibbs, 1914 pg. 26).

3.2.2. Travellers

A written history of the mountain starts with (later Sir) Hugh Low's ascent of Mount Kinabalu in 1851, although it is reasonable to speculate that earlier unrecorded attempts had been previously made (Jenkins, 1996; Moulton, 1915; St. John, 1986). Low, the colonial treasurer of Labuan, never made it to the highest peak (now named Low's Peak), and mounted two further attempts in April and July 1858 accompanied by Spenser St. John, the then British Consul in Brunei. St. John climbed to the second highest peak (now named St. John's Peak), and both expeditions successfully managed a significant botanical collection later described by Sir Joseph Hooker. Other expeditions followed, and in 1888 John Whitehead, an ornithologist, was the first European to have reached Low's Peak, the highest point between the Himalayas and New Guinea. Whitehead is also credited with the first elaborate exploration of Kinabalu, and spent, in 1888, three months living amongst the Kiau Dusun (Whitehead, 1991). The first enumeration of the Flora of Mount Kinabalu by Otto Stapf appeared in 1894, affirming Kinabalu's status as a botanical paradise (Stapf, 1894). Since then, Kinabalu has been visited by countless naturalists (see Table 3.2.1). Significant for our purposes are those of Low (1851) and St. John (1858), Whitehead (1888), Lillian Gibbs, the first European woman to climb Kinabalu (1910), J.C. Moulton (1913), and Joseph and Mary Clemens (1915).

Table 3.2.1. Summary of expeditions to Kinabalu (Source: Jenkins, 1996)

Year	Summit Expedition	Route
1851	Hugh Low Botanical	Via Kiau
1856	Thomas Lobb Botanical	Turned away by natives
April 1858	Hugh Low and Spenser St. John Botanical	Via Kiau
July 1858	Hugh Low and Spenser St. John Botanical	Via Kiau
1873	Felice Giordano Geological	Turned away by bad weather
1877, 1878	FW Burbidge and others Botanical & Ornithological	Via Kiau
1879	J Peltzer Undocumented[2]	
1887	RM Little Chartered Company peacekeeping	Via Kiau
1887, 1888	John Whitehead Ornithological and zoological	Via Kiau
1892	GD Haviland & HA Haviland	Via Kiau

[2] "Undocumented" means that no known records documenting the journey have been found by Jenkins (or myself).

	Botanical	
1892	FS Bourns & DC Worcester Ornithological Undocumented	
1894, 1899, 1908	J Waterstradt Professional insect collector Undocumented	Via Kiau
1899	R Hanitsch & PM Fontaine Zoology	Via Kiau
1899	HT Burls Geology	Via Kiau
1904	GH Goss & D Dodge Ornithology Undocumented	
1910	L Gibbs & DR Maxwell Botany	Via Kiau
1910	FW Foxworthy Tourist	Via Kiau
1910	Capt. FC Learmonth, Lt. Harvey, RW Clarke, HWL Bunbury & JS Brown with Wigson, possibly the first bullterrier to reach the summit Survey of Mt Kinabalu	Via Kiau
1910	R Piltz Geology Undocumented	
1911	Albert Grauber Undocumented	
1913	JC Moulton & P Skene Keith Botany, Entomology, Zoology	Via Kiau
1915	Joseph and Mary Strong Clemens Botany	Via Kiau
1916	Oscar Cook, Rev & Mrs CE Swinnerton Summit climb	Via Kiau
1916	George A. Grenville Haslam Botany & Entomology Undocumented	Via Kiau
1921	Rev J Strugnell, Dr. CH Yeager & Barnet Undocumented	
1923	Brigadier-General Hussey & BR Cole-Adams Undocumented	
1924	RF Evans & CR Sarel Demarcate new route up the mountain	Via Tinompok
1924	BR Cole-Adams Undocumented	
1925	CM Enriquez Botany, Ornithology & Zoology	Via Tinompok
1928	C Boden-Kloss, JL Humphreys, RF Evans & GH Vinen Reconnaissance for expedition	Via Tinompok
1929	HM Pendlebury & FN Chasen Entomology	Via Kiau
1931	Rev Joseph and Mary Strong Clemens Botany	Via Tinompok
1931	RE Holttum & Rev Joseph Clemens Botany	Via Tinompok

1932	Rev Joseph & Mrs Clemens, Rev JW Rowland & NW Rowland Botany	Via Tinompok
1932	GWA Bullock & G Farelly Undocumented	
1933	His Excellency AF Richards, RF Evans, D Round-Turner & BW Hurrell His Excellency's tour	Via Tinompok
1933	CE Carr Botany	
1937	John A Griswald Zoology	Via Tinompok
1937	E Wenk Geology Undocumented	
1939	Vivian W Ryves Ornithology	Via Kiau
1942	Lt Ryuichi Yamaguchi & fifteen soldiers Summit climb	Via Tinompok
1942	Tokayuki Kobashi & three soldiers Summit climb	Via Tinompok
1943	Lt Kaoru Kobashi & party Filming - a 35mm 8 reel black and white documentary (1.5 hours) entitled "Mount Kinabalu" was produced; stored at the film library of the National Modern Museum in Tokyo.	Via Kiau
1948 onwards	Various scientific and recreational expeditions	Via Tinompok

3.2.3. The rise to Kinabalu

Moulton (1915) described three routes to reach the top of Kinabalu (see Table 3.2.2). First was the Northern or Tempasuk route, starting from Abai in Usukan Bay and travelling a good forty miles inland to Kiau. In 1888, Whitehead calculated this would have taken six days fording the Tempasuk River on many occasions, not accounting for delays in dealing with various tribes along the way, to finally arrive at Kiau[3] (Whitehead, 1991). The second route was the Western or Tuaran route, pioneered by Hugh Low in 1851, from Gantisan and along the Tuaran River that would have taken five days of an equally challenging walk to get to Kiau. The third route was the Southern or Interior route, taken by Lillian Gibbs, which comes in from Tenom and would have taken six days to walk to Kiau. From Kiau the journey confronts an abruptly steep terrain through fields and thick forests, and added to an interest in making biological collections, would have taken one day to make camp at Lobang along the southern ridge of Kinabalu, followed by another day's travel to either the makeshift camping ground at Kamborangah or the chilly

[3] It is difficult to determine if the "Kiau" referred to in various expedition notes is a reference specifically to Kiau Nuluh or one of the other Kiau villages at the time, or collectively to all of the Kiau villages. In this section I use the term "Kiau" in the same manner of indeterminacy.

shelter of Paka Cave. Yet another day would be needed for the ascent to the summit and the exploration of the summit plateau.

Table 3.2.2. Summary of routes

Year	Route pioneers	Route
1851	Hugh Low	**Tuaran route:** Jesselton (by steamer) - Tuaran – Bawang – Kalawat – Bungol - Kiau
April 1858	Hugh Low & Spenser St. John	**Tempasuk route:** Jesselton (by steamer) - Abai – Bungol – Kaung – Lobong-Lobong – Kiau
1910	Lillian Gibbs	**Interior route:** Jesselton (by train) – Tenom – Melalap – Senagong – Apin-Apin – Tambunan – Korikut – Mensanggau – Bundu Tuhan - Kiau

3.2.4. At the head of the bottleneck

Whitehead (1991) remarked that the rights to the forested regions of Kinabalu had been divided up between the various villages scattered around the mountain. Each village claimed the collecting and hunting rights to the portions directly surrounding their village, whereupon the extent and boundaries of their territory were respected and mutually upheld by neighbouring villages. Incursion into another village's territory was a most serious offence, and it appeared as though "this etiquette [was never] transgressed" (Whitehead, 1991 pg. 112). Services of porters and guides would only carry the traveller to the edge of their territory, whereupon the traveller would need to seek assistance from the reigning village for a new batch of guides and porters (see Plate 3.2.1).

Photo © The Sabah Society

Plate 3.2.1. The Ryves expedition accompanied by Dusun guides and porters travelling between Kaung and Kiau (picture taken in 1939 by V.W. Ryves)

This arrangement placed Kiau in a strategic position because the only known pass to the summit of Mount Kinabalu sat within their territory (possibly shared with Bundu Tuhan). To get to Kinabalu therefore, the traveller would have had to appease the Kiau Dusuns and employ their services as porters and guides before their party could have been permitted to ascend the summit. In 1856, Thomas Lobb failed to scale the mountain because he had refused to meet the payments demanded by the Kiau Dusuns and was consequently turned away (Moulton, 1915; St. John, 1986; Whitehead, 1991). By 1924 however, a new summit path from Tinompok was pioneered, and since then, the majority of expeditions were routed from Tinompok, with porters being taken from the nearby village of Bundu Tuhan in addition to the arsenal of skilled guides and porters from Kiau (Jenkins, 1996). This route has developed into the conventional summit trail that exists today, and many more expeditions have been conducted to explore the various regions of Kinabalu. Today, the Kiau summit path is still known by the villagers in Kiau Nuluh as the Hugh Low Trail, although its reach to the summit is only possible upon permission from Kinabalu Park authorities.

Thus from 1851 to 1923, *all* the documented ascents of Kinabalu were routed through Kiau. For 72 years Kiau was the central transit point, and gatekeeper to Mount Kinabalu. The early expeditions brought to Kiau a plethora of visitors, not just the European expedition leaders but

also their entire entourage (Low brought 42 people in 1851, Burbidge had 28 men in 1877, and Learmonth had over 100 people in 1910) including Chinese, Malay and Javanese servants, and numerous indigenous porters and interpreters from the lowland villages of North Borneo (Jenkins, 1996). This usually involved a stay in the village area, and without fail, earned the employment of the Kiau Dusuns as guides and porters. The propensity of such traffic to induce change is, perhaps, far less astounding than the ability of the Kiau Dusuns to have coped with, and absorbed, their mixed fortunes. An expedition brought strange people and their strange habits to the doorstep of an ordinary villager. It brought an interest in biological species and a curiosity with features of the natural world. It brought trade goods to be exchanged for food, lodging, and their services as guides and porters. It also brought about the summit climb, which to the Dusun of the time, was the equivalent of the mortal believer walking right into the domain of their spirit world.

SECTION THREE: A MATTER OF BUSINESS

3.3.1. Logistics

The two most controversial challenges to the Kinabalu expedition, so it appeared, were the deluge of interminable rain and the fragile dealings with the natives. In these early days, logistics were everything of a sweaty nightmare. Sufficiently efficient and reasonably priced porters and guides had to be recruited at each passing village, upon whom sat the unenviable task of carrying buffalo loads of baggage over days of heavy walking. The Learmonth party even brought beds, mattresses and chairs to the summit plateau (Jenkins, 1996)! With the exception of Thomas Lobb, early travellers were always armed, and even though no mortal wound was ever reportedly scored, guns were regularly used to threaten the scurrilous villagers into acquiescence (St. John, 1986). Whether it was in negotiating payments for their services or the right to pass their territory, a clumsy bargain was cause enough for the journey to be tediously rerouted. Rather than impose European systems of organisation and commerce, these travellers found themselves submerged in the native world of village politics. Villages, it appeared, were embedded in a localised, but nonetheless complex, network of interrelations, whether the politics of tribal war or the economics of production, trade, and consumption.

3.3.2. A head for a head

In the 1800s, the coasts of North Borneo were a hive of activity with the comings and goings of trading vessels, the enterprises of merchants and travellers, and activities of Chartered Company stations (also King, 1993). As a result, coastal populations were highly diverse and the influence of migrating groups could be seen in the use of Malay as the predominant trade language, recent conversion of coastal Bajaus and Illanuns to Islam, establishment of small Chinese settlements

and gardens, a high degree of mixed marriages, and even an enterprising Black African in Bengkoka near Kudat (St. John, 1986; Whitehead, 1991). Further into the interior, we arrive at Dusun territories, which have been described as remote lowland and highland settlements (St. John, 1986; Whitehead, 1991). Bearing in mind that the distinction between lowland and highland Dusuns could well have been the reflections of our travellers, there did not seem to be a clear definition upon whence a lowland area ended and the highland regions commenced. There are, however, consistent references to indicate that the villages of Bungol, Ginambur (possibly Taginambur) and those living in lower altitudes were considered to be lowland Dusuns. In 1885, Whitehead also referred to lowland Dusuns in the coastal areas cultivating wet rice in Patatan (possibly Putatan, in what is presently known as the Penampang and Papar plains) and in Tawaran (possibly Tuaran). The people of Kiau, Kaung, Lobong-Lobong, Melangkap, Sayap and other villages in the foothills of Kinabalu have been consistently referred to as highland Dusuns.

In 1885 the Chartered Company was based in the eastern coast town of Sandakan. On the west coast, the Company had established a station on Gaya Island (an island opposite the present day state capital of Kota Kinabalu), but was too isolated to be able to administer the affairs of mainland North Borneo (Whitehead, 1991). Company officials would travel to the interior once every few years and only occasionally were representatives sent to visit the inland tribes, the only business being to collect the hated poll taxes. Rather than fulfil the mediating intentions of the Company, these infrequent visitations often aggravated local tensions to no end (at least until the next visit!). In one instance, a visiting official declared the headman of Lower Kiau as the "head-headman" of all three Kiau villages then conveniently left the said headman to collect taxes from the other two disgruntled villages. As such, government retained very little knowledge of, and was incapable to mediate, many tribal disputes in the interior. Villagers settled their scores through waves of tribal warfare and therein we find their invariable reputation for head hunting.

Along the Tempasuk valley, the Muslim Bajaus and Illanuns had ongoing feuds with lowland Dusuns at Ginambur, who in turn were feuding with the highland Dusuns at Kaung and Kiau. The Kiau Dusuns were reputed head hunters, and it seemed, had ongoing feuds with the Ginambur Dusuns and the Bajaus themselves. Far from being an indiscriminate killing spree, head hunting was an established measure to settle an old score with a rival tribe - "the vendetta feeling is strong amongst these tribes, and they generally go on the war-path after the rice-harvest, for the purpose of paying off old scores" (Whitehead, 1991 pg. 109). Indeed, tribal war, with its misleading sensationalism of head hunting, was very possibly a social and political mechanism for the postulation and resolution of cost-benefit analyses by both the protagonist and antagonist - with calculative political implications for way standing villages (Yap, 1985).

Even as an outside observer, St. John (1986) had observed that this guarded hostility was more a product of disagreements between villages rather than a whimsical massacre directed at the ordinary person. An attack on a rival village was distinctly a man's duty, and was executed in the manner of the most serious expedition whereupon heads that were brought home as trophies were hung "outside the windows in rattan baskets" (Clemens, 1916; Whitehead, 1991 pg. 109). In Kiau, Kuro claimed there to have been over fifty head trophies taken from various rival tribes, with attacks having been conducted on villages as far as four days' walk (Whitehead, 1991). Despite these tensions and regular news of tribal warfare, the atmosphere in a village was usually placid. Villagers resolutely went about their daily chores travelling freely and unprotected to their fields, making it quite likely that impressions of tribal war, and head hunting as such, were hyperbolic renditions of social conflict. By 1913 however, the Chartered Company had posted officials in many interior sub-districts, head hunting was forcefully outlawed, and finally vanquished through the influence of the church (Moulton, 1915).

3.3.3. Networks

Evidently, there appeared to be some degree of contact between villages, perhaps for attacks and espionage, although more likely, it would have been for trade. The curious ease with which people were able to acclimatise to different dialects and communicate freely with each other, despite seemingly hostile tensions, suggests that so-called warring tribes have maintained relatively frequent social contact over many years (St. John, 1986). Far from being isolated, villages were interconnected by a network of routes, the more often traversed routes being the better maintained paths. Villagers had knowledge of the basic travel routes from coast to interior and could identify the routes to the next village and the village thereafter. Formerly, the coastal Bajaus were known to travel as far as the highland Kiau Dusuns to trade salt, and Kama, a Kiau Dusun, described a trade route further inland to the east, a distance of three days' walk, passing the villages of Tuhan (possibly Bundu Tuhan) and then Inserban (possibly Kinasaraban) before arriving at the great lake of Ranau (St. John, 1986). By 1851 however, our travellers tell us that tribal feuding and stiff territoriality had overshadowed the movements between villages. The Bajaus and Illanuns did not trade any further inland than Ginambur. Similarly, the highland Kaung and Kiau Dusuns refused to trade with the lowland Ginambur Dusuns. Yet it was apparent that trade goods were being circulated between the coast and the interior in spite of all the feuding. Whitehead observed that "Kiau is apparently the chief factory for these [sun] hats; as nearly every Ilanun and Bajow of the coast has one or two" (Whitehead, 1991 pg. 157).

The trade network may have operated by way of various personal transactions or through middlemen from Tambatuan and Tuaran, but more likely, trade was enabled through "tamels" (*tamus*) or market days (St. John, 1986; Whitehead, 1991). In the Tempasuk valley, *tamus*, upon

mutual agreement between tribes, were held regularly at various neutral locations and was the one day when all neighbouring tribes could congregate to peacefully trade local goods. In addition to commerce, *tamus* were also a social occasion where a great deal of gossip was exchanged and appeared to be the primary way for news to travel between coast and interior. Tensions were nonetheless high, and a little gossip the wrong way would have led to the bloody, but uneventful, exchange of fists. Evidently, trade embodied the alliances and rivalries of village politics, just as much as it enabled the propagation of social contact as the depot of production and consumption.

As such there was indeed an established trade network where, at *tamus* closer to the coast, Bajaus and Illanuns traded salt and salted fish in exchange for the rice, cooking pots, native cloth and other trade goods brought by lowland Dusuns. At *tamus* further inland, these lowland Dusuns traded their goods in exchange for the tobacco, hand woven baskets and hats, bamboo and other forest produce from the highland Kaung and Kiau Dusuns (also Burrough, 1978). Whitehead noted "many Dusuns go three or four times a month to these tamels, which are generally held in dried-up river-beds. To the tamel they will often make a two days' journey, with a few articles of their own manufacture... over a country which is in itself a pilgrimage to traverse, a good many of the heaviest loads on these occasions being carried by the women" (Whitehead, 1991 pg. 107). It is tempting to speculate that women, who could have been nonchalantly excused from the feuding inclinations of the men, were in fact the main conduits for the exchange of goods between neighbouring tribes.

3.3.4. The currency of commerce

The natives therefore, possessed a certain degree of business savvy having the ability to gauge and thereby demand payments in exchange for their produce and services. A great degree of haggling ensued as natives tried to obtain as much of the European's trade goods as possible, while the European would try to obtain the best possible bargain. In recounting his stay in Melangkap, Whitehead noted that "a Dusun brought me a small chicken, and on asking him the price, he looked round the house for a second or two, and pitched on a blanket, which he evidently considered would be about the value of his chicken. He refused to take anything else, so I went without my dinner" (Whitehead, 1991 pg. 104). To a village, the visit of a European presented a most profitable enterprise, and villagers demanded compensation for rent, food, buffaloes as beasts of burden, and their own services as porters and guides. Upon comprehending the collecting intentions of their visitors, many enterprising villagers had voluntarily brought specimens of plants, birds, small mammals, grubs and whatever else that could take the white-man's fancy, in exchange for payment (Moulton, 1915; St. John, 1986; Whitehead, 1991). The mode of payment was determined by the articles of fashion at the time

ranging from cloth, brass wire, mirrors, needles, cotton, buttons, empty tins and other containers, to the clothes and belongings of the traveller himself. During Low's 1851 expedition, beads and brass wire was the preference in Kiau. By April 1858, only brass wire was the desired item, swiftly replaced some three months later, by an appetite for trade cloth (St. John, 1986).

The much cooler temperatures of the highlands, and the surprisingly sparsely cloaked highland Dusuns, made trade cloth and needles very desired items (Clemens, 1916; St. John, 1986; Whitehead, 1991). The measuring of cloth payments had thus become a serious transaction where "all cloth is measured by the fathom or "*dapah*", which is seldom more than 5 feet 10 inches, often less, being the length that a Dusun can stretch while holding the cloth between the tips of his fingers across his chest. The villagers invariably hunt up their longest "*dapah*" stretcher, and he measures the first length, which is cut off – all eyes during this operation being bent on the cloth to see that it is just slack and not stretched in the least. After the first length has been cut, it is best to mark an equal measure on the floor and work from that... It is a great mistake to have more than one quality of cloth of the same colour, as this only leads to disputes, all naturally wanting to have the best and refusing the inferior quality" (Whitehead, 1991 pg. 113).

By 1910, the exchange of monetary currency was becoming more visible although the desire for trade goods brought by the Europeans was still strong, presumably because payments in trade goods saved villagers the arduous journey to *tamus*. People in Kiau seemed to have begun collecting deposits of money, as Gibbs remarked "I was constantly asked to exchange piles of copper cents, the bulky up-country currency, for one dollar notes" (Gibbs, 1914 pg. 27). Over time, these bulky up-country coins were strung together into a lattice work of decorative chains hung around the waists of women, made into brooches and ornamental buttons, and became infused into the traditional dress of the Kiau women.

3.3.5. Only mountains, jungles, rivers and the surrounding seas

Scholars like Ongkili (1981) who write that before the Chartered Company in 1881 "there was no community, no overall administration, no state economy, no state government; only mountains, jungles, rivers, the surrounding seas, and isolated villages scattered over the more than 29,000 square miles of tropical and warm equatorial land," invite the dangerous devaluation of the localised social, political, and economic processes that characterised the lives of indigenous peoples at the time. While I do not aim to provide a comprehensive critical analysis of the political and commercial sophistication of the time, I certainly do contend that the evident ability of villagers to grasp the intentions and needs of various expeditions, and to have mastered the

efficiency of channelling services, certainly suggests a substantial degree of political and commercial organisation inherent to these communities.

Upon closer inspection, what could be seen as the arbitrary and irrational behaviours of indigenous peoples in these early years, does in fact reveal patterns of political and commercial organisation, whose sophistication extends far beyond the fairy tale images of the complacent subsistence farmer. Ironically, these localised processes of politics and commerce had been flourishing for many generations past, while the state itself continued to flounder for its foothold. It is within this historical context that our travellers arrive at the foothills of Mount Kinabalu, and came to deal with the Kiau Dusuns.

SECTION FOUR: GATEKEEPERS

3.4.1. Eye of the beholder

The main concern of our travellers was the progress of their collecting expeditions, and thus more attention was paid to the character and purpose of their journeys, whether it be the collection of specimens, delays because of rain and flooding, the unsettled climates of tribal warfare or the remunerative demands of their native employs. Only marginal critical study was made of the character of the indigenous peoples themselves, and although journals abound with descriptions of various tribes, most observations have been coloured by the colonial demeanour at the time (also King, 1993). It is additionally important to note that voucher plant specimens collected during these expeditions very rarely recorded the local Dusun names or local uses of the plant, and almost never cited the collector's name if the specimen had been collected by a local person (Beaman, 2003 pers. comm.[4]). Example citations found among the Clemenses field labels read "via Dusan" or "Dusan Coll.". Furthermore, observations made about Dusun people were inclined towards generalised descriptions of similar characteristics of *all* Dusuns, with little attention to possible regional variations between Dusuns in different villages. Descriptions of Kiau have been difficult to disentangle because of many inconsistencies between journals and potential inaccuracies. To a European barely able to speak Malay, let alone Dusun, there would have been ample opportunity for miscommunication, and the construction of false impressions. It is primarily through Whitehead's observations, having spent eleven weeks in Kiau, from whence we now draw an appreciation of what the Kiau Dusuns were like (Whitehead, 1991).

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[4] John Beaman and his colleagues have been studying more than 20,000 plant specimens collected over history as part of an enumeration of the Flora of Mount Kinabalu. To date, four volumes have been published, with the final volume of this project scheduled for publication by the end of 2003. Beaman also states that the first serious record of Dusun plant names and uses only began in 1992 with the PEK collections (see chapter two, section six).

3.4.2. On the southern spur

In 1858, St. John described Kiau as a single village poised along the southern spur of Kinabalu, an observation that was later elaborated by Whitehead in 1888 that Kiau was made up of three small villages running from the top of the hill down to the Kadamaian River below (St. John, 1986; Whitehead, 1991). The highest village was known as Kiau Nuluh, the middle Whitehead called Middle Kiau, followed by Lower Kiau. By 1913, Moulton (1915) makes the observation that Middle Kiau had joined with Kiau Nuluh. Whitehead noted "My aneroid gives the altitude of Kiau as nearly 2,800 feet. Kiau is built near the top of a spur which runs round in a curve from the S.E. extremity of Kina Balu; this spur is actually part of Kina Balu, and runs up to the base of the granite precipices... where it attains a height of nearly 9,000 feet" (Whitehead, 1991 pg. 157). The double peaks of Sadok-sadok[5] (6,000 feet) flank the village to the west, and the pitcher-plant haven of Marai-parai along the western spur a little further up to the northwest of Kiau (see Figure 3.4.1). The higher slopes above Kiau form the headwaters of the Penokok (Tinokok) River, with offshoots such as the Haiahaia (Hayo-Hayo), supplying water to swiddens. The headwaters of the Kadamaian come from the very tops of Kinabalu, and run below Kiau north-westwards until it joins with the Dahombang (Tahubang) River to form the Tempasuk River that flows into the South China Sea.

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[5] Sadok-sadok is known as Nungkok by people in Kiau Nuluh today, even though the name Sadok-sadok is still being used in other villages and can be found on many maps (also Beaman et al, 1996).

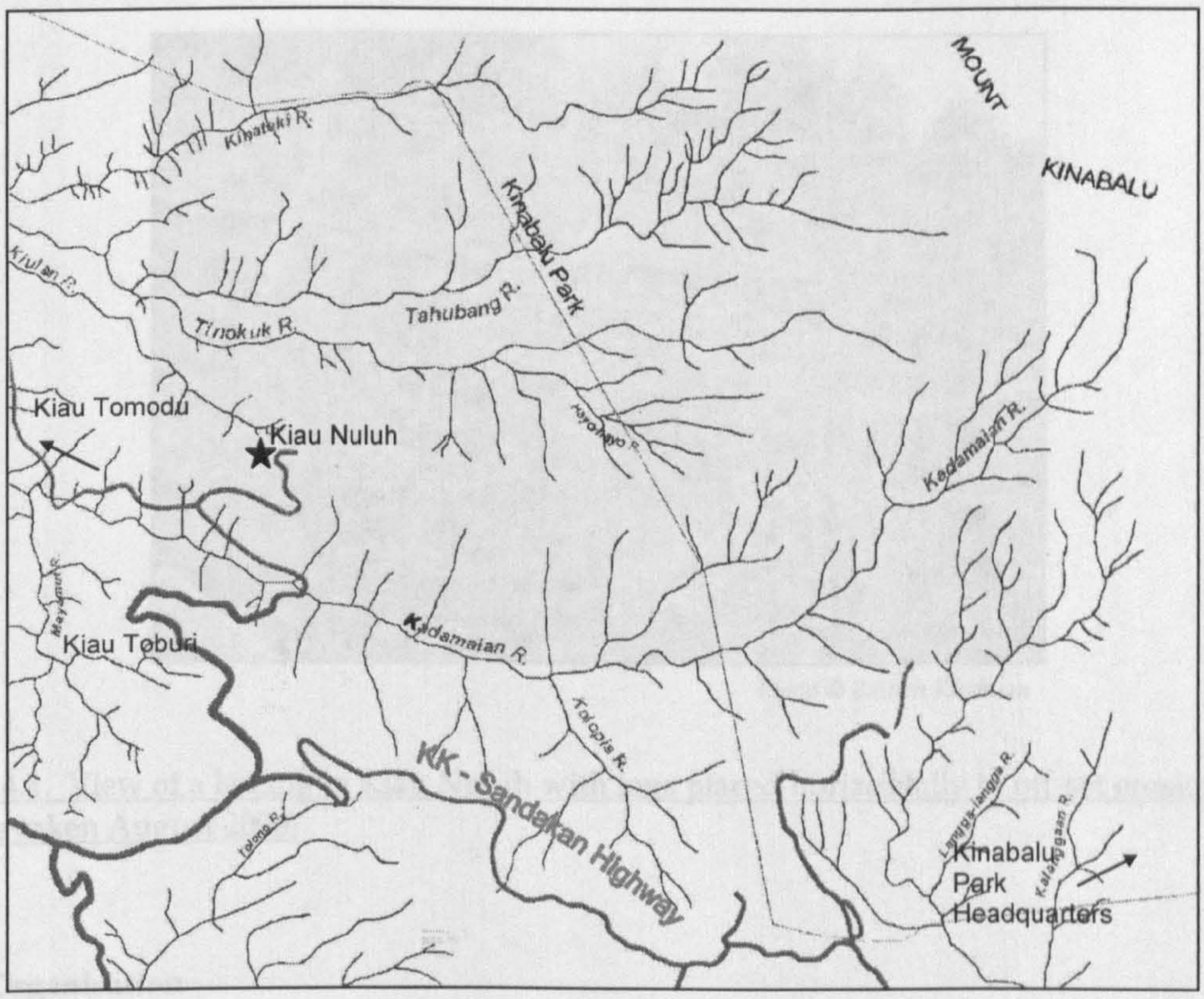

Figure 3.4.1. Map of the Kiau area (Source: adapted from the Projek Etnobotani Kinabalu and the work of Prof. John Beaman and Dr. Reed Beaman)

The primary forest zone generally started from about 3,500 to 5,500 feet, after which it develops into upper montane and supalpine zones (Gibbs, 1914). Although these higher slopes were left as permanent forest, much of the lower slopes were covered in secondary forests of old fallow or had been cleared for cultivation. Kiau sat in the secondary forest zone (2,500 to 4,000 feet), with evidence of cultivated lands having reached as high as 4,000 feet by 1910 (Gibbs, 1914). The hills around the villages were swathed in swidden plots alternating with forests that have been left to fringe the edges of streams that flow into the Kadamaian. St. John (1986) also noted that one side of Sadok-sadok had once been cleared for cultivation. In opening up forest for agriculture, slopes were protected by leaving "intersecting belts of trees and fringing woods to the stream", and that steeper slopes were secured by laying logs horizontally to offset erosion (Gibbs, 1914 pg. 27) (see also Plate 3.4.1). Towards Kaung, the valleys were planted with wet rice.

Photo © Bainah Kimbuan

Plate 3.4.1. View of a ladang in Kiau Nuluh with logs placed horizontally to off-set erosion (picture taken August 2000)

3.4.3. Organisation

In Kiau, much like other villages at the time, the village was the main political and organisational unit under the leadership of the *Molohing* (village headman) (St. John, 1986; Whitehead, 1991). The village consisted of several long houses located close by, which were the shared dwellings of several families. Family sizes tended to be small due to malnourishment, high infant mortality and diseases such as small pox (Whitehead, 1991). The family was the basic social unit, and the primary unit of production and consumption, headed by the eldest or most dominant male. Land was the shared property of a family, with some families owning more land than others, whereupon ownership conferred a heritable right to land and the forest produce within (Whitehead, 1991).

3.4.4. The home

Houses, similarly, were the property of families. The size of a long house was, and still is, referred to in terms of the number of doors rather than the number of apartments (Clemens, 1916), such that any given number of doors would represent the equivalent number of apartments (see Plate 3.4.2). The basic structure of the house was made of *atap* (palm leaves) walls and roofing, plank siding, and the inside floors were made of split bamboo that "soon becomes beautifully polished, but, I am sorry to say, affords a splendid covert between the tiny cracks for numerous specimens of most disgusting insects" (Whitehead, 1991 pg. 105). Except for the small windows, the interior of the long house was dimly lit and the indoor fireplaces made for sooty walls and ceilings. What informants have told me, and certainly unbeknown to our

travellers at the time, is that the unpleasantly sooty veneer actually helped to boost the water resistance of the *atap* roofing.

Photo © The Sabah Society

Plate 3.4.2. Dusuns pose in front of a long house in Kiau (picture taken in 1939 by V. W. Ryves)

Water was supplied to most doorsteps by *solunsug* (a network of long bamboo chutes) (Clemens, 1915; St. John, 1986). House building was a community effort, and a house was known to last from five to seven years, whereupon it falls apart or was demolished, and the planks recycled for the construction of a new house. The length of the long house was divided into two compartments (Clemens, 1916; Whitehead, 1991). The *timbaas* was an open corridor that ran the entire length of the long house and was the communal space for all household members. The opposite length of the long house was a series of doors, each leading to a private apartment called *pisuk* where each family slept. A bed was a broad wooden plank with a small block of wood, placed under the neck, for a pillow. In the highlands, the Dusun "is an early riser, the want of warm bed-clothes turning him out before sunrise" (Whitehead, 1991 pg. 108).

3.4.5. Population

There is no evidence to indicate that the population of Kiau was anything but ethnically homogenous, and Kiau was invariably a collection of Dusun villages. There was some degree of rivalry between these villages, quite likely spurred on by competition to snare the European travellers and their goods. The main medium of communication was Dusun, although Malay was spoken by a surprising number of people, particularly the headmen and guides (Gibbs, 1914;

Moulton, 1915; St. John, 1986; Whitehead, 1991). The population density was reported to be much bigger in 1851, Low stating "the tribe of Kiow is... numbering upwards of 2,000 fighting men", which is, to some degree, supported by the extensive levels of cultivation noted by St. John in 1858 (Moulton, 1915 pg. 139; St. John, 1986). I am not easily persuaded to believe the population in 1851 could have been larger than it is today in 2003, as no other traveller conspired to a similar estimation, and it is doubtful whether the limited rice harvests and traded produce could have sustained such a large community. It is perhaps, easier to believe how such numbers could have been deliberately exaggerated by the natives themselves to amplify the might of Kiau during times of tribal warfare. By the time of St. John and Whitehead however, the reported population size was considerably reduced, perhaps from the ravages of small pox and cholera, although it would be more likely because the bravado of tribal war had gradually dissipated under Company enforcement (Clemens, 1916; Gibbs, 1914; St. John, 1986; Whitehead, 1991). In 1913, Moulton remarked Kiau as being "a little over a hundred adult men" (Moulton, 1915 pg. 139).

3.4.6. The Dusun disposition

The Kiau Dusuns were well remembered for five distinct traits. They were the guardians of the summit pass who were formidable head hunters, great rat-trappers, successful tobacco cultivators, and incessantly intoxicated. Any occasion was excuse enough for a drink, whether a welcoming or parting, the drinking being most Bacchanal during festivities such as weddings and the rice harvest celebrations which continued for a number of days. Whitehead's (1991, pg. 156) first impression of Kabong, whom about his body hung various bamboo flasks of alcohol, was of astute drunkenness. The primary source of alcohol noted by our travellers was *toddy* (St. John, in 1858) or *tuak*[6] (Whitehead, in 1888) derived from tapping the fruit stem of the coconut tree such that "these palms do not look healthy, the continued tapping of the "tuak"-loving Dusuns being the chief cause of their deterioration" (Whitehead, 1991 pg. 157) (see Plate 3.4.3).

[6] These days some people still refer to the drink as *tuak*, although the more common name is *bahar*.

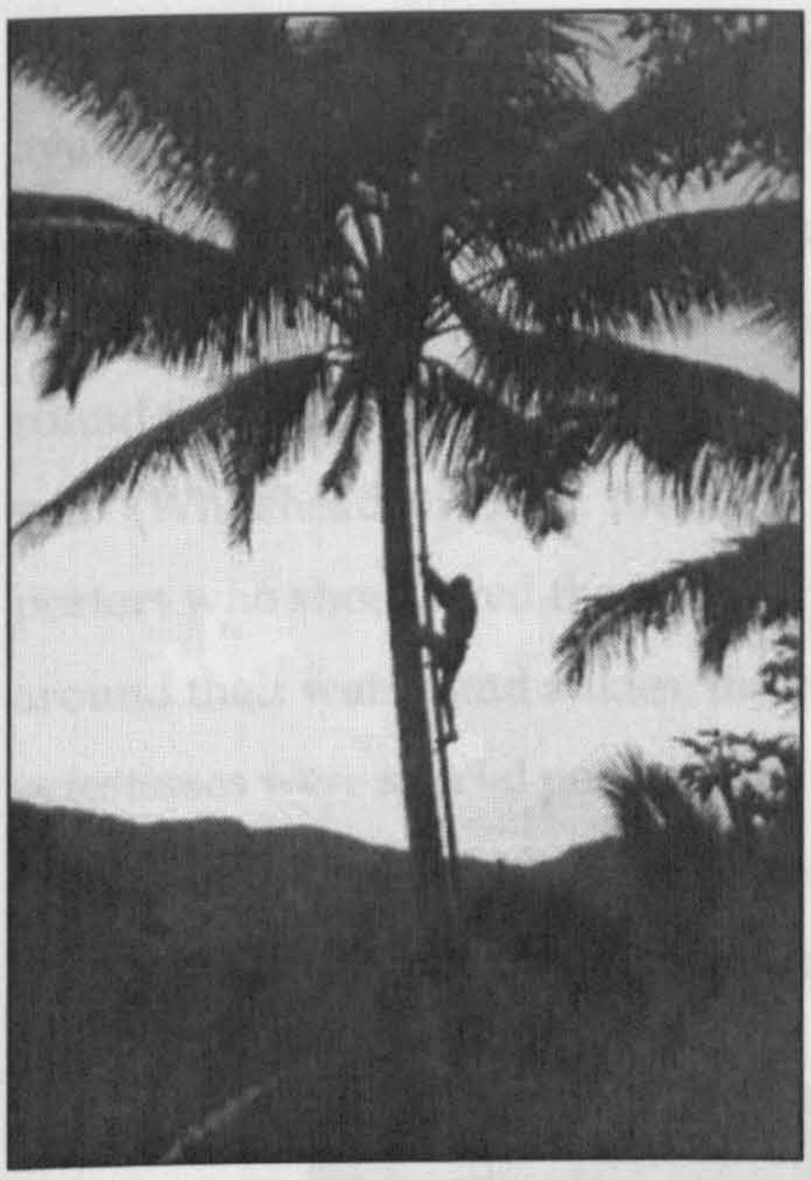

Photo © Gimbot Gindur

Plate 3.4.3. Until today, many Kiau Dusuns regularly harvest *tuak* (also known as *bahar*) from coconut palms in their backyard, as does Ladsou (74 years) shown in this picture taken by his wife Gimbot (74 years) in August 2000.

The highland Dusuns were a handsome people, of fairer complexion than the coastal tribes, and their features recalled a distinct Chinese-Mongolian flavour (St. John, 1986; Whitehead, 1991). The average height was around 5 feet 5 inches, but what size discounts was greatly surpassed by their ability to carry the heaviest loads over miles and miles of rugged hilly terrain (Whitehead, 1991). Men generally wore the *cawat* (loin cloth made from tree bark), and those who had them, wore trousers sewn from trade cloth. They usually carried a *parang* (hand held machete), sometimes a spear, and in Kiau, their indispensable portable flasks of *tuak*. Some of the men had simple tattoos on the arms, but their design was not as intricate as those of the Muruts (St. John, 1991; Whithead, 1991; also Yap, 1985). Teeth were filed short and blackened, although little reason was postulated as to the purpose of such practice. The younger men did not cut their hair until they became fathers, and facial hair was seldom seen, "most men being provided with a small pair of tweezers, with which they jerk out all stray specimens, the importation of small looking-glasses by ourselves giving a fresh impetus to these hair-jerkers" (Whitehead, 1991 pg. 106).

The women wore hand woven indigo blue skirts, usually decorated with red beads and brass chains. Younger women wore a strip of trade cloth over their breasts, kept in place by red rattan coils tied together (St. John, 1986; Whitehead, 1991). This covering was removed once they became mothers (see Plate 3.4.4). The women filed their teeth like the men, shaved their

eyebrows into narrow arched lines, and the foreheads of some young girls were shaved. It appeared as though only the right ear was pierced, although again, no insight was made available as to the rationale that could have augmented this practice. The women used a wooden hair comb that was usually a gift from their lover or husband. They tied their hair in a knot on the top of the head, "through which a bone hair-pin is attached to a string of beads... wound round the base of the knob... [and] a cowl is worn during field-work as a protection from the sun" (Whitehead, 1991 pp. 106-107). The women mixed freely with the men, often employed as porters who shouldered the heaviest packs during a journey. Some women wore brass coils around their waists and ankles, the priestesses being the more decorated dressers. The priestesses were special people who were religious and cultural authorities, and were called upon to conduct ceremonial offerings at births, weddings, deaths, housewarmings, and numerous rituals throughout the rice cycle (see also chapter two, section five).

Photo © The Sabah Society

Plate 3.4.4. A group of Dusun women from Kiau (picture taken in 1939 by V. W. Ryves)

Marriage was an arrangement of the family who, together with the village elders, determined the suitable pairings of their young children. The wedding proceedings were a perplexity to Whitehead, although he managed to note the ceremonial payment of the brideprice, usually in the form of buffaloes and gongs. In May 2002, a re-enactment of a traditional wedding ceremony was conducted in conjunction with the marriage of Geoffarry Gunsalam and Linah Dalansu. In consultation with the elderly people in the village, the couple decided to forego the contemporary white wedding gown and rock band wedding, in favour of reviving the customary wedding procedures of the Kiau Dusun. There were three stages, the first being the visit to the bride's home to negotiate the brideprice. Then on the eve of the wedding day, two

male representatives from the groom's family would visit the bride's home to prepare her leave from her family. The following morning, after much merry-making, the representatives would have to first search for the elusive bride, and upon finding her, the bridal procession would start for the groom's house. At the groom's home, the couple would sit and eat together to symbolise their new status as a married couple. Henceforth, the merry making and drinking would go on for days.

The Kiau Dusuns appeared much healthier than their lowland and coastal counterparts. Nonetheless there were health concerns such as malnourishment, high infant mortality, and the prevalence of fatal diseases such as small pox and lesser afflictions such as *kurap* (skin disease). The Dusun believed disease and ill fate were the curse of evil spirits, and priestesses were called upon to deflect these spirits with incantations and tonics. They believed that spirits of their dead lived at the top of Kinabalu, and guardian spirits inhabited features of the earth (also Pugh-Kitingan, 1989). Omens such as snakes, centipedes and other animals coming from a wrong direction would have cancelled the day's activity (Whitehead, 1991). A Dusun would hang a collection of charms inside their house to ward off evil spirits, the charms being comprised of all sorts of curiosities including bits of coral from the coast, animal teeth, roots and eagle's feet tied together with bits of grass.

3.4.7. Subsistence

The Dusuns planted mainly hill rice but often the supply of rice was not enough to last the whole year, most families having to survive on *keladi*[7] (*Colocasia esculentum*), yams, sweet potatoes, vegetables and fruits until the new rice harvest was completed. The swidden cycle of burning, dibbling, guarding and harvesting, set the pace for rice cultivation in family-owned plots of three to six acres and a fallow period of roughly seven years (St. John, 1986; Whitehead, 1991). At the time, there was an abundance of arable land, but the reportedly small family sizes and lack of proper nourishment would have made labour shortages quite likely. A three-acre swidden located some distance from the village would have been harsh work and lengthy travel for any family, and so families built a "small bamboo house" (*sulap*) in the swidden where they could stay while tending their fields (Whitehead, 1991 pg. 107) (see Plate 3.4.5). Families who owned lots of land did employ their relatives to help at harvest time, whereupon payment was in the form of tobacco rolls. Tobacco was the most important cash crop in Kiau, the plots being afforded more care and attention than their subsistence swidden gardens (Gibbs, 1914; St. John, 1986; Whitehead, 1991).

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[7] *Keladi* is taro, also known by several local names: *rongguol, guol, kadai,* or *kapal*.

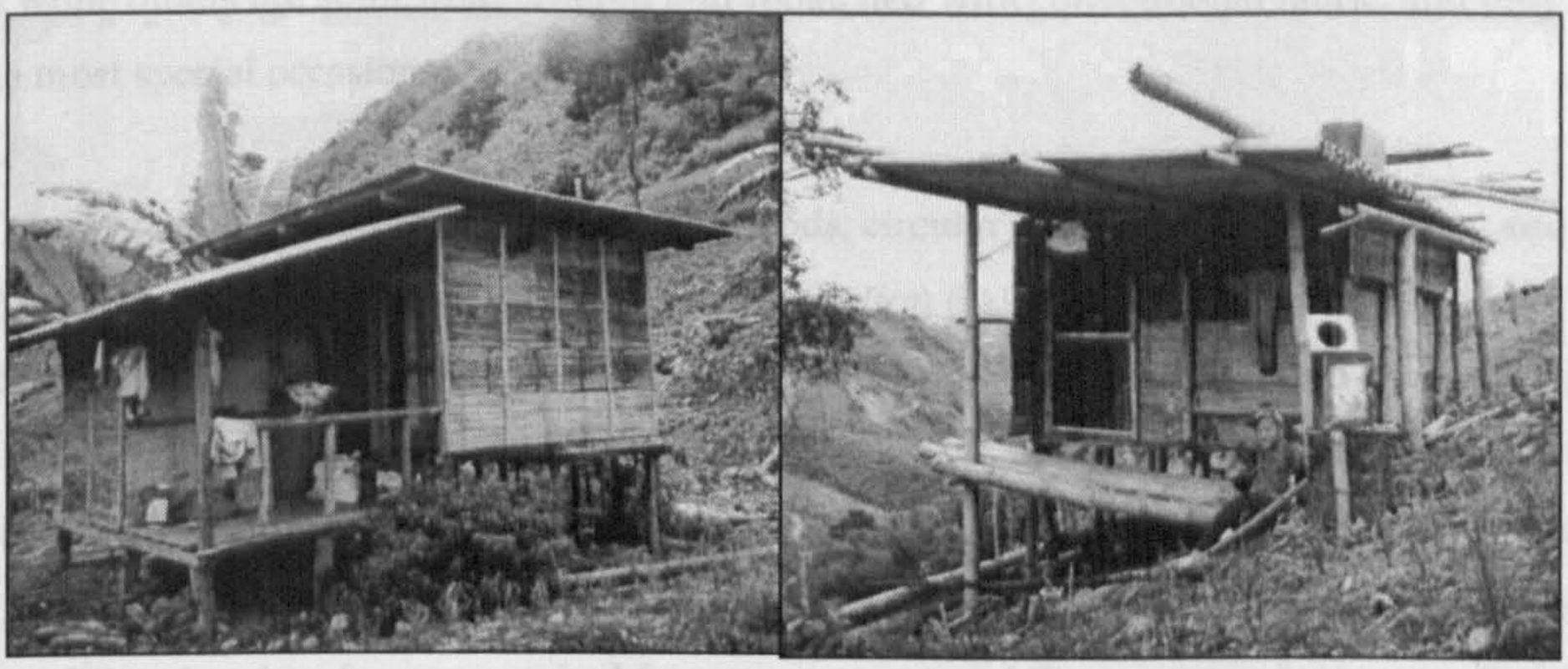

Photo © Sanan Sulidan *Photo © Lusiah Sulidan*

Plate 3.4.5. *Sulaps* are still used in Kiau Nuluh today as a resting hut while working in the planting fields

Forest products were usually used to manufacture domestic items such as traps, mats and baskets, which were additionally traded at *tamus*. The men and women of Kiau were industrious manufacturers of sun hats, baskets, rattan mats, and bark ropes (Whitehead, 1991). Added to their tobacco crops, the production of handicrafts lent an enviable trade advantage to the Kiau Dusuns whose increased spending power, coupled with their monopoly over the summit pass, made them wealthier and healthier than other interior Dusun villages at the time. Sago palm (*rumbio)* leaves were used as the *atap* roofing of houses, and Areca palm nuts (*lugus)* were the compulsive chewing preoccupation. As we have seen, the coconut palm was the indispensable supplier of *tuak,* although it does seems likely to me that the manufacture of rice wine was already commonplace. They manufactured torches with rattan caskets and using *damar* as fuel, which together with the kindling fires that burned at night, created ample opportunity for an active nightlife.

It was during the nights that women would make cloth by weaving trade cotton with strands of fibre from *lamba* (*Curculigo sp.* possibly *Curculigo latifolia*) leaves. Today, the skill and knowledge of making *lamba* cloth has long been dormant in Kiau, and it is through Whitehead's (1991) observations that we learn how the lengths of fibre from the underside of the leaf are separated, tied together, then wound around a stick and woven on a small loom. It is then dyed indigo blue (possibly from *Indigofera tinctoria*) and used by the women as skirts. Cloth produced from this arduous regime was rather stiff, so when our European travellers brought in trade cloth, combined with needles made from trade brass wire, native cloth making was gradually phased out. A few *lamba* skirts still exist in Kiau and are regarded as precious family heirlooms, some

intact while others are somewhat tattered and repatched with conventional fabric, and only worn for the most special occasions.

They also fished in the rivers using homemade rods, circular cast nets, bamboo baskets, and using *tuba* (poison from a plant, possibly *Centella asiatica*) (St. John, 1986; Whitehead, 1991). The men hunted and set traps in the forest to catch a range of animals from pigs and *kijang* (deer) to rats and *bunong* (frogs). The Kiau Dusun were insatiable rat-trappers, Kabong being able to list nineteen Dusun names for the nineteen species of rats and squirrels in the vicinity (Whitehead, 1991). Rat-traps (see Plate 3.4.6) were homemade rattan constructions, the victims then spilt and skewered onto bamboo frames, smoked for preservation, and the meat was hung over fireplaces until eaten. A meal would consist "chiefly of rice, and any delicacies the Dusun has collected during his daily wanderings – such as rats, mice, fish, frogs, tadpoles, beetles, grubs and chrysalides, all of which are stewed down and eaten as a relish with the rice" (Whitehead, 1991 pg. 108). Hunting trophies of animal skulls (even of the diminutive rat) could be found hanging inside a house (Clemens, 1916; Whitehead, 1991).

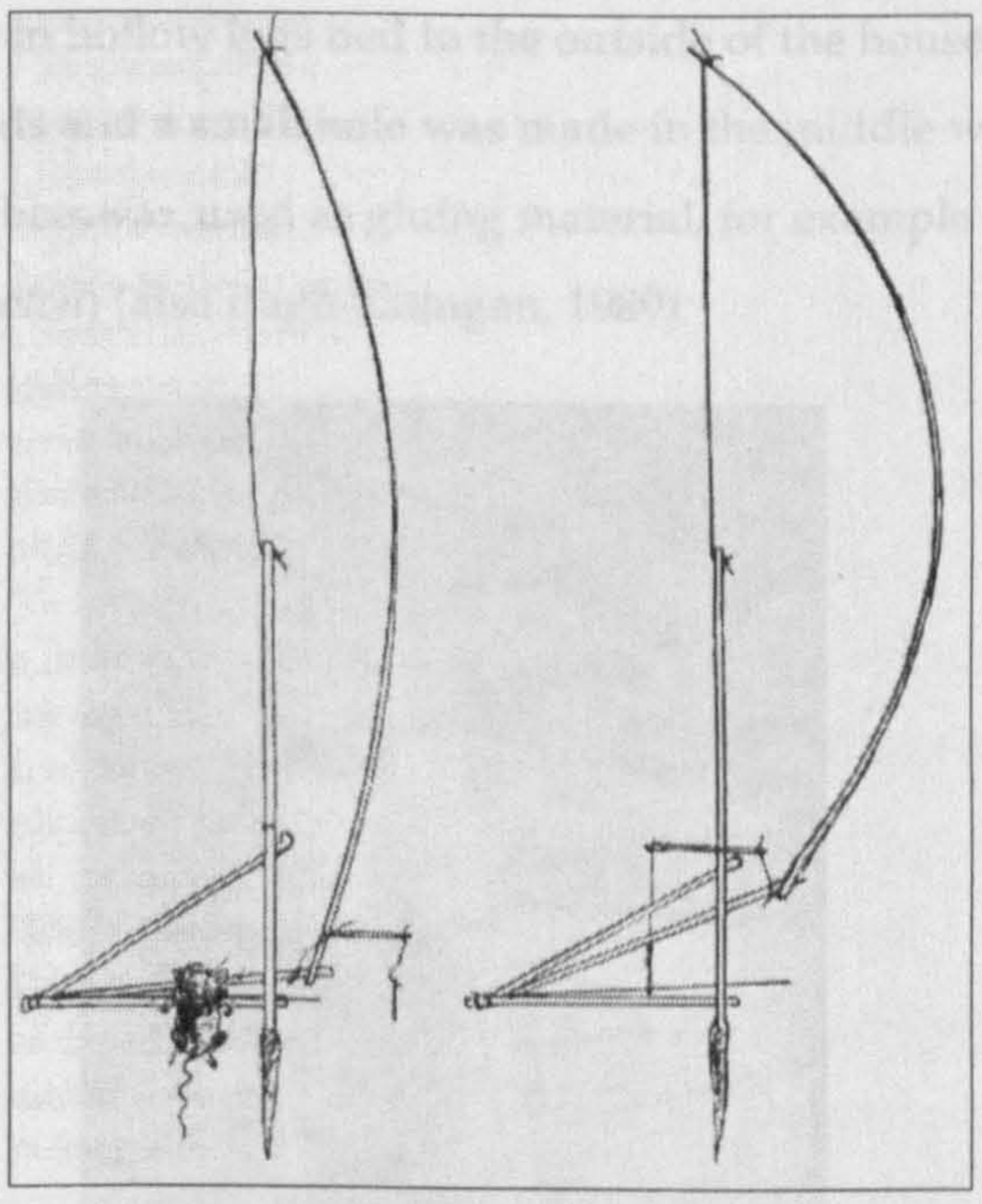

Plate 3.4.6. Dusun rat trap (Source: Whitehead, 1991 pg. 167)

There were very few household goods, and although gongs could be found in almost every house it appeared that jars were a rare possession (Whitehead, 1991). Their cooking utensils consisted of a few large earthenware pots and wooden spoons. Rice was stored inside long lengths of large bamboo shafts placed upright against a wall, although larger quantities of rice were kept outdoors in separate storage huts (St. John, 1986; Whitehead, 1991). Some had musical

instruments such as gongs and tom-toms, *bungkau* (jaw's harp), and a "species of panpipes fixed in a gourd" (*sumpoton*) (Whitehead, 1991 pg. 108; also Pugh-Kitingan, 1989). In addition to the *parang* and spear, there were other weapons such as Brunei *krisses*, *sumpitans*, and rattan or wooden shields that occasionally decorated the interior of a house. In Kiau, there was a small group of blacksmiths who worked in small huts or shops called *sipuan*, where they manufactured *parangs* (Clemens, 1915).

The Kiau Dusun kept domestic animals such as cattle and buffaloes, *waguk* (pigs), *tasu* (dogs) and chickens, in many cases, living right beside or under their homes. Pigs were important animals (and even answered to a given name) used as ceremonial sacrifices and later eaten. Buffaloes and cattle were used for riding and carrying things, but in the hilly areas they were more kept for feasts. Dogs were important for hunting, while cats, Whitehead noted, were scarce, spotting only one such animal during his three months in Kiau, reasoning that because "a Dusun can both catch and eat his own rats and mice, the presence of this animal would be superfluous" (Whitehead, 1991 pg. 112). Chickens were kept for their meat and eggs, and being easy prey to hawks, they were kept during the nights in rattan baskets (*kukurungan*) hanging along the house. Some kept bees (*tantadan*) in hollow logs tied to the outside of the house (see Plate 3.4.7). The logs were sealed at the ends and a small hole was made in the middle where owners could collect honey and *sapilut* (beeswax used as gluing material, for example where the bamboo pipes meet the gourd on a *sumpoton*) (also Pugh-Kitingan, 1989).

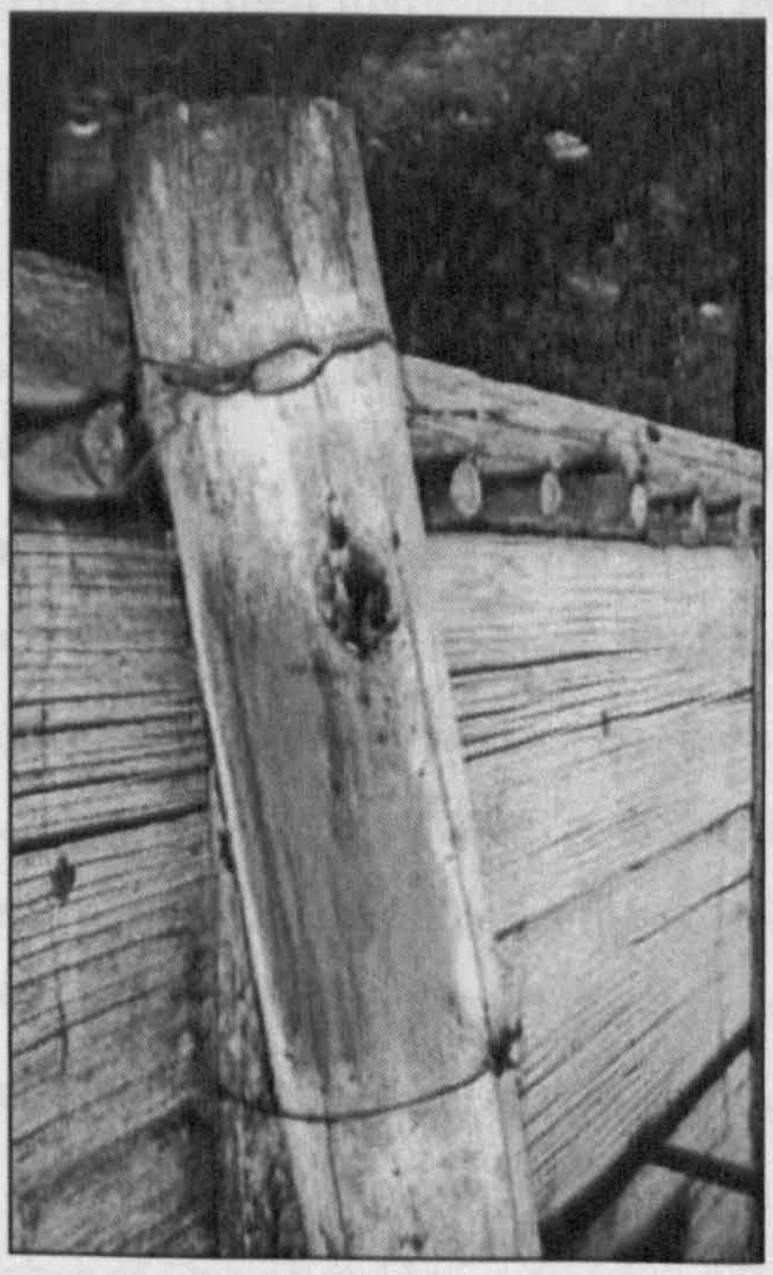

Photo © Mailim Sampang

Plate 3.4.7. Kiau Dusuns today still keep *tantadan* in hollowed out logs or bamboo containers, usually hung along the side of the house (picture taken August 2000)

3.4.8. Business under a spirit's shadow

For an expedition, transit time in Kiau was strictly a matter of business, and while social interaction was a matter of course, the main agenda was still the journey to Mount Kinabalu. For the Kiau Dusun, it must have been, if anything, a little curious to host such an enterprise in their village. St. John and Low were possibly the first few Europeans to arrive in Kiau, and as a result, the European party and the native people somewhat unnerved each other. St. John recalled incidents when villagers had stolen their goods, finding on many occasions, the necessity of firing warning gunshots (St. John, 1986), and yet some years later, both "Tuhan Helow" (Hugh Low) and "Tuhan Hingin" (St. John) were remembered with fondness (Whitehead, 1991 pg. 158). Whitehead however, had the good fortune of arriving much later, and by this time, the Kiau Dusun had developed relatively remarkable business acumen. The recruitment of porters and guides, determination of payments, organisation of goods into basket backpacks, and other travel arrangements were efficiently negotiated. They had maintained the cleared path from the village up along the southern spur to the granite slopes of Kinabalu at about 11,000 feet (Whitehead, 1991). Guides and porters would follow the established route, and along the way, they rested at camps that were used by previous expeditions. Evidently, the summit climb seemed to have developed into an organised village enterprise, much to the benefit of expeditions that followed (Clemens, 1916; Gibbs, 1914; Moulton, 1915).

Jenkins (1996) postulates an interesting theory, that the summit climb was a new enterprise developed by the Kiau Dusun through their involvement with these historical expeditions. The summit plateau, after all, was considered as the resting place of the dead and taboo to the living (Regis, 1996). Low in 1851 remarked that Paka Cave was the highest point the Dusuns had ventured up the mountain (Moulton, 1915). The summit route itself did not seem to be familiar traverse to *all* Kiau Dusuns, as some of the Kiau porters during Whitehead's ascent were lost for an entire day (Whitehead, 1991; also Yap, 1985). Only certain individuals such as Lamat and Sumpot would be called upon to guide the summit climb, and even by 1910, Lamat had only four ascents to his credit (Gibbs, 1914). The Kiau Dusun, it appeared did not, in their leisure or any other preoccupation for that matter, embark upon a climb to the summit of their own initiative. As Harrison notes, "they left the top 1,200m (4,000 ft) for the spirits, a place to which even the dead could not go easily, even the invisible were controlled – they had to qualify by death to climb" (Harrisson, 1996 pg. 4). Thus what for the European was strictly a matter of business, was for their Dusun companions, quite conceivably, a walk into the realm of the dead.

And yet, for the growing number of Dusun guides, a transgression into the spirit world was acceptable so long as suitable payment was forthcoming from their European counterparts. In turn, the Dusuns offered prayers and sacrifices to appease the spirits and seek assurances for the

safety of the climbing party. Jenkins asserts that earlier climbing rites did not seem to resemble any standardised format but guides offered prayers and sacrificed chickens at various stages of the journey. During Whitehead's ascent, Kuro carried a live chicken all the way up the mountain, and offered prayers while planting the tail feathers of the chicken upright in a row in a small crevice – the said chicken was later eaten by the Dusuns upon their descent to Paka Cave. By the early 1900s, the structure of the rites had developed requisite ingredients namely, sacrificing three to seven live chickens, offerings of seven eggs, tobacco, rice, and betel nut, usually accompanied by a volley of gunshots, conducted at Sayat-sayat or the summit pool (Jenkins, 1996). By now Dusun priests or priestesses were given the exclusive offices of conducting the rites (see Plate 3.4.8).

Photo © The Sabah Society

Plate 3.4.8. A Dusun priestess prepares for the summit offering ceremony (picture taken in 1939 by V.W. Ryves)

In 1915, Joseph Clemens recounts "they assured us that not a man in their tribe would venture on that mountain without their priests. They took with them four chickens, seven eggs and other things to offer as sacrifices to the spirits of the mountains… I went with the priests when they offered their sacrifice the day before we went to the top. They spread on a large leaf some cooked and some (raw) rice, some salt, some cheese, and the various things they use in chewing the filthy betel nut, and the smoking outfit; and there in sight of the great solid granite, they offered a most fervent prayer to the spirit of the mountain. They carried a bunch of good luck charms also and handled these while praying and placed an egg beside their offering" (Clemens,

1916). Today, the mountain guides of Bundu Tuhan and Kiau still perform these ceremonial rites every year on the tops of Mount Kinabalu.

Jenkins makes the acid accusation that the rites could have well been a rouse to secure more profits from the expeditions, as it was the European leaders who paid for the sacrificial costs, of which the chickens were later eaten by the Dusun guides. Jenkins further cites reports of Dusun companions who chattered about and paid little attention to the ceremonies, although I feel it is difficult to determine whether the Dusun subscribed to the solemnity of a Continental church service for their own mountain top ceremonies. I contest that these rites retained cultural significance for the Dusun climbers and were indeed, inspired by the fear of spiritual transgression described by St. John (1986) and Whitehead (1991). After all, could a believer walk into God's bedroom and rummage through the cupboards, serve up some boiled *keladi*, and expect to get home with little reprimand? It is perhaps, easier to believe that years of traffic on the summit climb very rapidly diminished the magnitude of the spiritual transgression, and ceremonies came to be regarded as symbolic gestures. It is reasonable to stipulate that these expeditions have indeed grafted the origins of the ceremonial climbing rites, and thus contributed to Dusun culture in Kiau. What were initially uncertain variations of prayers and sacrifices offered in the days of Low and Whitehead, soon became embedded in the cultural schema of the Kiau Dusun. Over time, there evolved a structured format of sacrificial rites conducted by priests or priestesses, inscribed as prerequisite ritual ceremonies that were then demanded of expeditions in the name of tradition (Hobsbawm, 1984).

3.4.9. The spirit of survival

Kiau, at the turn of the 20th century, with the comings and goings of large European parties, must have been quite a remarkable place. Any romanticised notions of the Kiau Dusuns as isolated subsistence farmers content with their lot in life should be deservedly drowned in *tuak*. They were, quite simply, farmers who were the defenders of their territory, instigators of tribal war, manufacturers and traders, expedition organisers, and stewards of their cultural identity. They made decisions, whether it was to attack a rival village, to send their women to the *tamus*, to incorporate Company coins into their dress, to corral a European party to the summit of Kinabalu, or to carry a live chicken to the summit plateau, kill it, and then eat it, decisions, which made them active participants in change.

This historical perspective, albeit somewhat rudimentary, suggests a few key points. First, the Kiau Dusuns were in a state of transition, which presumably, will continue to unfold until tomorrow. Second, it suggests that the community was reacting to outside forces of change as much as they were initiating change themselves. From *tamu* trade to their dress, language and

the summit climb, the Kiau Dusuns seemed to be opportunistically exerting control over how they wished to engage in social change. Crucially, stereotypical elements of 20th century development in Sabah such as political organisation and ethnic domination, trade and cash cropping, and even tourism, were elements already existing in Kiau past. Thus history seems to suggest, rather strongly, that elements of change are not so much a fault of the recent development propaganda, but more a constant character of how the community continues developing strategies to interact with their surroundings over a long, long time.

SECTION FIVE: WHERE ARE WE TODAY?

3.5.1. A remarkable place

Kiau today, still sits on the southern spur Mount Kinabalu, and now falls under the administrative jurisdiction of the Kota Belud district (see Figure 3.4.1 earlier). Incidentally, the name *Kiau*, local people tell me, means "thirstlessness", that one will never feel the need to be thirsty or that all thirst is quenched before there is a need to ask[8] (also Beaman *et al.*, 1996). The entire area that is known as Kiau ranges in elevation from about 600m to 1,200m asl, contributing to a temperature range from about 29°C during the day to a mild 14°C at night. As a general rule there are two main seasons: the dry season which goes roughly from the months of April to October and the rainy season which goes from November to March each year, but the distinctive nature of these seasons tend to fluctuate given regional and global climatic factors. The most recent El Niño and La Niña southern oscillations that struck from 1997 throughout most of 1998 brought a period of severe drought, ravaging bush fires, followed by an extended period of intense rain and flooding (Kitayama *et al.*, 1999).

Today there are three villages that make up Kiau: Kiau Toburi, Kiau Tomodu and Kiau Nuluh. Kiau Toburi is a relatively new settlement comprised originally of the inhabitants of Lower Kiau (or possibly Middle Kiau) whose staggered migration over years have moved the village closer to the main highway. The initial settlement (that people can remember) was called Rani, located on a hillside above the Kadamaian River. From there, villagers migrated much farther up to a new settlement called Paka, only to move this time in the 1970s, to the present day settlement of Kiau Toburi. There was also another settlement next to the banks of the Kadamaian River that came to be known as Kiau Dua, but these villagers have also migrated, over the years, to join the settlement at Kiau Toburi. The primary school and two houses now occupy the former Kiau Dua site. Kiau Nuluh is the old settlement of Kiau Satu (Whitehead's Upper Kiau). Kiau Tomodu is a small satellite village that was formed through staggered migrations from Kiau Nuluh, in the late

[8] I have always harboured suspicions that this analogy has somehow developed in relation to the *tuak*-loving tendencies in this community.

1970s, to be closer to rice fields. Today, these villages are poised on the slopes of the Kadamaian Valley, which nestles the Kadamaian River. The two other main rivers are the Tinokuk and Tahubang Rivers, and water supply is piped from the nearby Kiulan and Linggion Rivers using a gravity feed system. The bare granite slopes of Kinabalu are easily visible from Kiau, dramatically giving way to thick upper and lower montane forests, followed by secondary growth and fallow, cultivated land, and the village area. The distance from the centre of Kiau Nuluh to the boundary of Kinabalu Park is approximately 3 km either directly north or northeast. While the forests inside Kinabalu Park represent primary old growth forests, areas outside park protection are young secondary forests and cultivated lands. The exception is *Lokos Diou*, the area that was excised from, and now borders onto, Kinabalu Park (see chapter two, section six), which comprises old growth primary and secondary forests.

3.5.2. Easy access

The journey from Kota Kinabalu (formerly Jesselton) to Kiau is a mere 90 minutes on the Kota Kinabalu - Sandakan highway, and another 30 minutes between Kiau and Kinabalu Park Headquarters. In 1997 a sealed road was built to bolster the connection between the main highway and Kiau Toburi, and all the way down to the primary school on the banks of the Kadamaian. After this point the road continues as a rocky gravel pitch climbing steeply towards Kiau Tomodu and Kiau Nuluh. Without fail, every rainy season, landslides will cause sections of the road, sealed and unsealed, to collapse (Daily Express, 2003a; Daily Express, 2003c; Daily Express, 2003d). In such times, people often drive the distance to the landslide, park their vehicles and walk across the landslide, then hitch a ride onwards.

This road represents what Pugh-Kitingan (1989, pg. 379) terms "culture breakout", in that people are no longer staying "within their traditional boundaries, but are travelling throughout Sabah and beyond in search of work, trade or education". The road has not only enabled daily travel, but also brought about the ownership of all sorts of vehicles from four-wheel drive trucks, small lorries, mini vans, cars and motorcycles, with a few families owning more than one vehicle. Villagers can engage in education and employment outside of the village while still maintaining close and regular contact with their families at home. It has furthermore, allowed the regular visitation of tourists, government officials, non-government organisations, clergymen, ice-cream vendors, and door-to-door salesmen.

3.5.3. In the village

The three villages that make up Kiau each lay claim to its own identity: Kiau Toburi referred to only as *Toburi* is the most modern, having on one occasion been jokingly referred to by some residents of Kiau Nuluh as being pretty much part of Kota Kinabalu. Kiau Tomodu referred to only as *Tomodu,* is the smallest, while Kiau Nuluh, the oldest of them all, is referred to as *Kiau*. In

local circles, Kiau Nuluh claims its position as being the "original" Kiau and its residents therefore as the "authentic" descendants of the Kiau Dusun, an identity that is gracefully shared with the recent offshoot of Kiau Tomodu. Conceptually speaking however, the peoples of Kiau Toburi, Kiau Tomodu, and Kiau Nuluh do share overriding similarities in their history and culture, and in the present day, are impossible to tell apart either by their behaviours or appearances.

3.5.3.1. Kiau Toburi

Kiau Toburi (approx. 800m a.s.l.) with about 850 people is the most modern in Kiau. It boasts a large built-up area of painted wooden houses poised along hillsides, a large *dewan* (community hall), several *syarikat* (sundry shops), and a several small eateries that also double up as local pubs. The village has access to electricity, piped water, and telephone lines. Many homes are equipped with television sets, video players, and a growing number of people have mobile telephones, and Kedai Kobujang (one of the sundry shops) has a private pay phone for village use.

3.5.3.2. Kiau Tomodu

Only an off-road vehicle can travel the full distance to Kiau Tomodu, a journey that can take up to twenty minutes from the junction to Kiau Nuluh under bad weather conditions, in most cases a short walk being inevitable. Kiau Tomodu (approx. 600m a.s.l.) with about 200 people is very small with houses built out of wood, or zinc and aluminium sheeting. Not all houses receive electricity supply although piped water is common as people construct bamboo pipes to sustain their own gravity feed water systems. Cash cropping of pineapples is the primary source of income for many households here. Fruits from the annual harvest are sold wholesale to buyers in Kota Kinabalu, and on a smaller scale at the local weekly markets.

3.5.3.3. Kiau Nuluh

Kiau Nuluh (approx. 1,000m a.s.l.) sits at the top of a hill, and thus the name *Nuluh* is derived from the Dusun word meaning hill (see Plate 3.5.1) (also Beaman *et al.*, 1996). The village has about 700 people, living in a variety of wooden and zinc sheeting homes, with houses clinging to the steep slopes all the way to the other side of the hill. Homes are supplied with electricity and water, although telephone lines remain an unfulfilled political promise. Many homes enjoy the luxury of household appliances such as televisions and refrigerators, a few people having mobile telephones, and a handful of people owning personal computers[9]. The village enjoys rich scenery of the Kadamaian Valley and the Kadamaian River on the one side, the rolling hills and valleys of Kiulan Valley on another, and the abrupt heights of Mount Kinabalu looming right

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9 When I wrote the first draft of this chapter there was only one family that owned a personal computer. One year later, I have to correct this observation because by now there are five households with a personal computer each.

behind. The surrounding hills are covered in swidden plots, pineapple and rubber plantations. From May to July when burning has just been completed, the swaths of charred swidden plots provide stark contrast to the pocket of greenery of the village area where fruit trees, coconut palms, and ornamentals have been planted, and against the lush backdrop of protected forests in Kinabalu Park just behind.

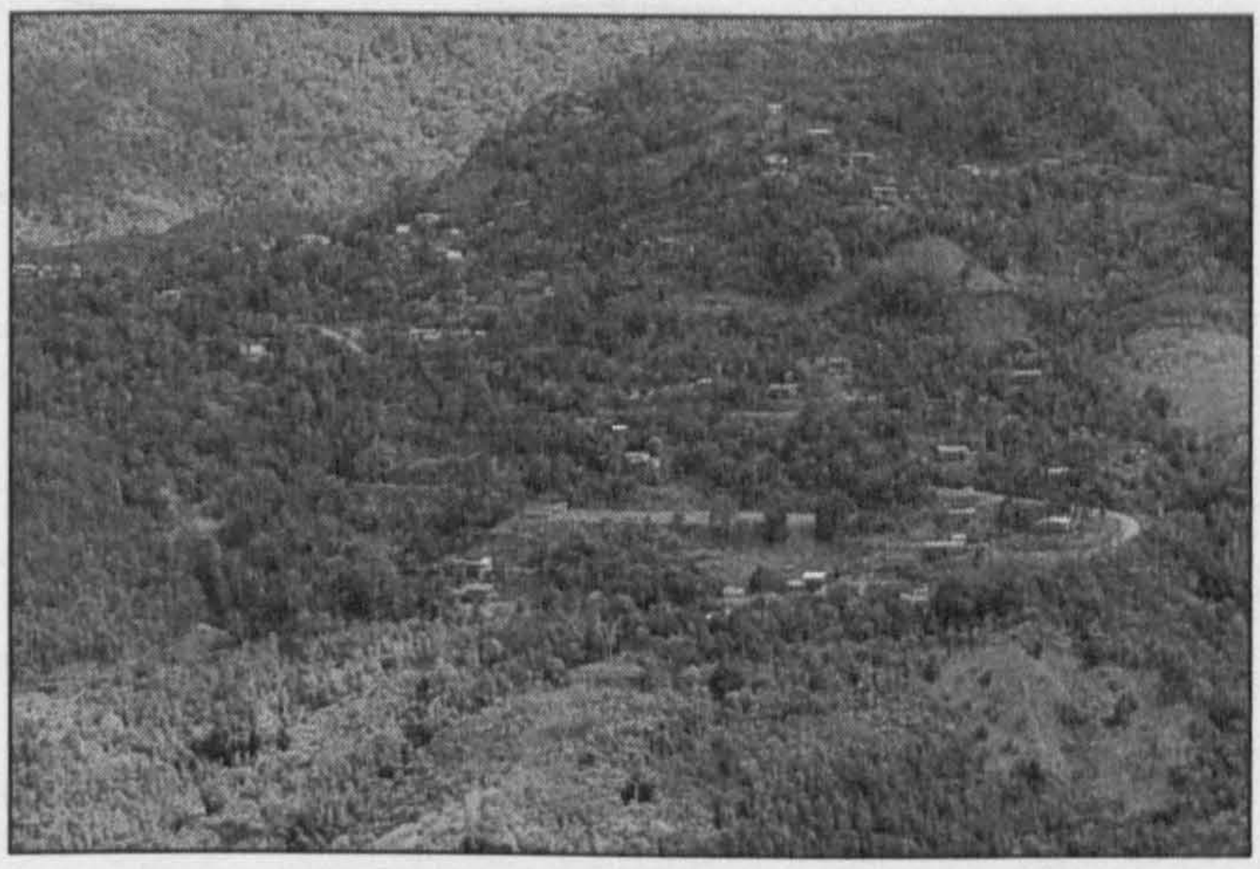

Plate 3.5.1. View of Kiau Nuluh village surrounded by swidden plots (picture taken in December 2002)

Kiau Nuluh is divided into six sections (see Figure 3.5.1). *Hobut*, the centre of the village, is marked by a large *dewan* (community hall) built from aluminium and zinc sheeting, and the football field. There are a few houses here, although the main emphasis in this area is the development of community facilities. There is the old *balairaya* (smaller community hall), which, since the construction of the *dewan*, was subsequently used to house the village kindergarten. A vacant plot sits lower down from the *balairaya* reserved for the eventuality that they may succeed in obtaining government support to establish a village medical clinic. Nearby, a small ethnobotanical garden, nursery, and resource center was established with the help of WWF Malaysia, in an effort to increase community access to useful plants. GOMPITO[10] has taken over the development of these facilities, and the resource centre has been turned into a small museum of cultural artefacts. In conjunction with the harvest festival celebrations in May 2002, four model bamboo and *atap* traditional houses, complete with exterior and interior household paraphernalia, were built on the edges of the football field as part of a community effort to rekindle age-old house-building skills and as an exhibition of their historical lifestyles.

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[10] GOMPITO is the village based community organisation. I shall elaborate on this in a following section.

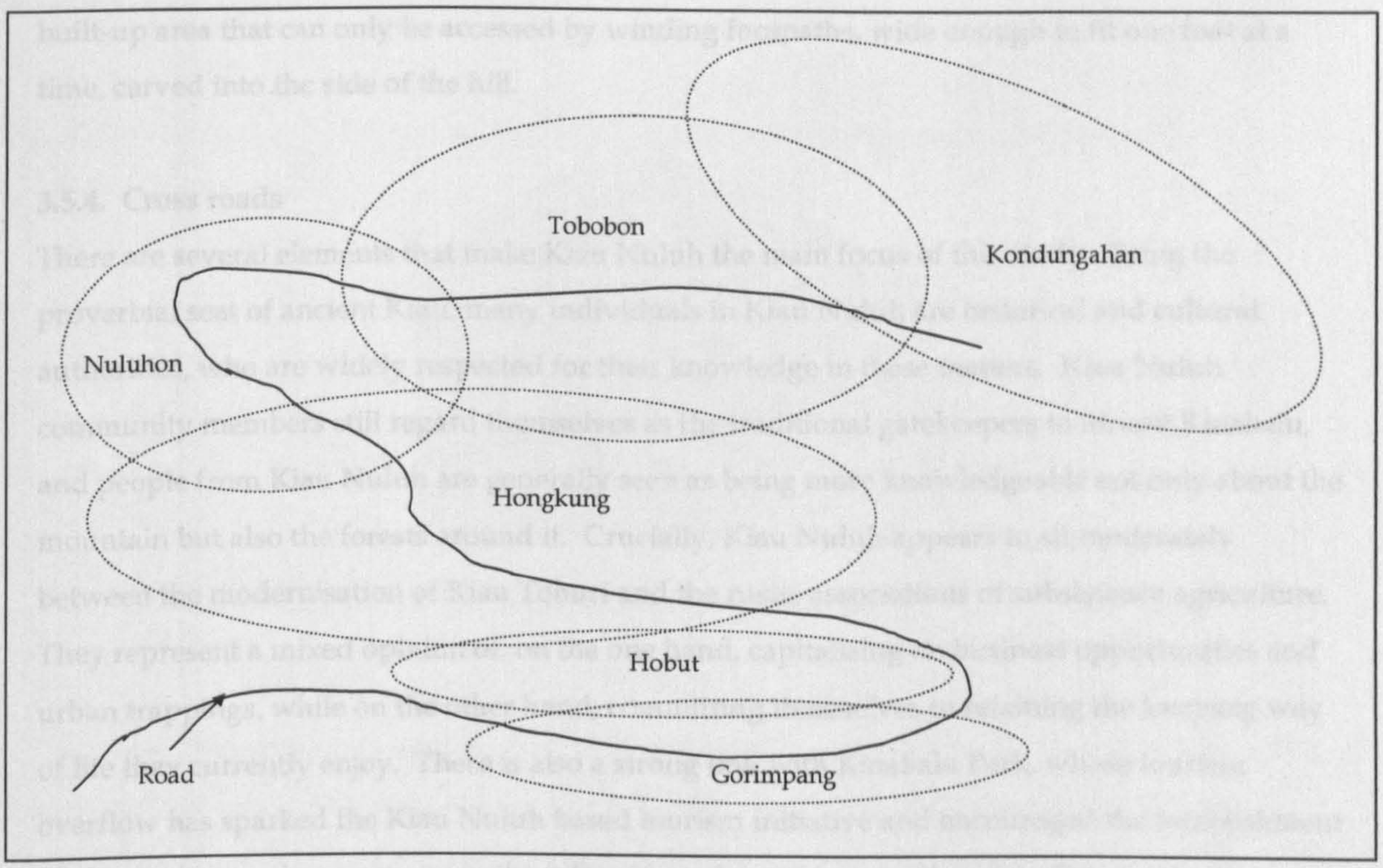

Figure 3.5.1. Illustration showing the different sections of Kiau Nuluh (not to scale)

Gorimpang, the lowest segment of the village, starts where the access road enters the village through a narrow cow gate, made up of a bridge of large pipes laid parallel to each other across the road, to prevent cows from leaving the village area. Cows that do leave the village area often damage crops through trampling and munching. There are a few houses here that stand at the side of the road. From *Gorimpang*, the road passes *Hobut* and arrives at the *Hongkung*, the middle section of the village, where many more houses have been erected. There is a small sundry shop[11], and further up is a small concrete building for the Sabah Evangelical Church (Sidang Injil Borneo or SIB). Higher on the crest of a ridge overlooking the Kadamaian Valley is *Nuluhon*, where the Roman Catholic (RC) Church sits. The Catholic Church is a small concrete building and next to it is a guesthouse built from wood and bamboo fittings, run by the Catholic Church, where tourists are lodged. About two years ago another sundry shop opened just outside the Catholic Church selling the usual variety of goods including ice cream, deep-frozen chicken nuggets, and crates of alcohol (the current favourites being Guiness and Bali Hai beer). From *Nuluhon*, the access road climbs up to, and ends at, a small flattened area surrounded by houses and fronted by another two small sundry stores. The road narrows along an enlarged footpath going slightly downhill to another larger flattened area whose hillsides are dotted with houses.

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[11] Sundry-shops are owned by resident villagers.

This area is called *Tobobon*. The last section of the village is called *Kodungahan*, and is the highest built-up area that can only be accessed by winding footpaths, wide enough to fit one foot at a time, carved into the side of the hill.

3.5.4. Cross roads

There are several elements that make Kiau Nuluh the main focus of this study. Being the proverbial seat of ancient Kiau, many individuals in Kiau Nuluh are historical and cultural authorities, who are widely respected for their knowledge in these matters. Kiau Nuluh community members still regard themselves as the traditional gatekeepers to Mount Kinabalu, and people from Kiau Nuluh are generally seen as being more knowledgeable not only about the mountain but also the forests around it. Crucially, Kiau Nuluh appears to sit moderately between the modernisation of Kiau Toburi and the rustic associations of subsistence agriculture. They represent a mixed opinion of, on the one hand, capitalising on business opportunities and urban trappings, while on the other hand, committing themselves to retaining the *kampung* way of life they currently enjoy. There is also a strong link with Kinabalu Park, whose tourism overflow has sparked the Kiau Nuluh based tourism initiative and encouraged the establishment of alternative tourism ventures in the village (see chapter two, section six). Our gatekeepers, so to speak, are at the gateway of the new millennium, and it is upon their conscience that rests an acceptable resolution of attaining development while retaining their historical and cultural identity.

3.5.4.1. The house

The very last long house in Kiau Nuluh was dismantled in the early 1960s, and today houses in Kiau are all detached bungalows. A house is the shared property, and home, of an extended family. Family size is quite large, with parents in their 40s and 50s having as many as eight to ten children. Younger parents currently have between two to five children, so houses can often have up to ten occupants. A survey of houses in Kiau Nuluh enables an immediate confrontation with the social stratification in the community, there being a range of houses that vary in size, materials, and design.

The increase in formal employment means that people have less free time to build their house, and this skill is gradually becoming less known among the wider community. There are however, persons in the village who specialise in house building and it is common practice to employ the said person to build your house for you. The owner provides the design of the house, all the materials, and pays the builder a daily wage that can range from RM 20-30 per day depending on the builder's skills, an expenditure of about RM 2, 000 in wages alone. Under

good weather conditions a medium sized wooden house can be completed within three months of full time work, and with good maintenance, can last for more than twenty years.

Plate 3.5.2. A house in Kiau Nuluh (pictures taken in December 2002)

The more affluent houses are constructed from tropical hardwoods such as *seraya* (*Shorea* spp.) and *selangan batu* (*Hopea* spp. and *Shorea* spp.), with aluminium and zinc sheeting for roofing, while less affluent houses are made purely from sheeting laid over a wooden frame. Other common choices are *mengilan* (*Agathis* spp.), *tikalod* (*Lithocarpus* sp.) and *buruni* (unidentified). Houses are built on thick *belian* (*Eusideroxylon zwageri*) stilts as a precaution against flooding, and the ventilation under the house helps to cool the home during hotter days. Some homes have walled up this area under the house to make a lower level. Timber is purchased from the local sawmill and it is extremely rare for wood to be extracted directly from the forest, except for fuel wood, making furniture and miscellaneous appendages (e.g. chicken coops, fences and parts of *sulaps*). Windows are usually hung with curtains and increasingly fitted with glass louvers. Additional facets such as a balcony, bamboo fittings, decorative banisters, and a stylish finish all point towards the status of the owner. Non-timber construction materials such as *poring* (bamboo), *atap* leaves (usually *Metroxylon sagu*), and rattans are still harvested from the forest on a regular basis. Most homes have grassy yards planted with a variety of ornamental plants, and are commonly fenced in with bamboo gates to prevent an intrusion of cattle.

A house often comprises an open family area, private rooms, kitchen and eating area, and washing area. Almost always, the toilet is constructed in a separate shed outside of the house. It is commonly held that a lavatory, as the designated place to deposit human waste, should be kept separate from the home. These toilets use the sinkhole system that requires the user to squat for the exercise and subsequently flush away by pouring a bucket of water down the hole. A flush toilet inside the house is an immediate sign of modernisation, although this is not a practice that is widely accepted by many people. Kitchens are commonly constructed as an extension to the main house as a precaution against fire, and can either be a traditional wood

fired cooking area, or the increasingly common gas stove. The wok is an indispensable utility, followed by an assortment of plates, cups, cutlery and other kitchen utensils. Furniture, although seemingly easy to build and are an indicator of status, seem to be a mixed priority in Kiau Nuluh. Some of the largest homes are completely unfurnished, thus eating and sleeping are all done on the floor. Statelier homes have basic furniture, either bought or self-made, including chairs, tables and beds. Electrical goods in general, such as television sets, radio and stereo sets, video players, and cameras are becoming quite common.

3.5.4.2. Citizens of the state

Without any exception known to me, everyone in Kiau Nuluh holds state issue birth certificates, their most basic license to exist in Malaysia. At the age of twelve, they are issued identity cards. When they marry, they receive a marriage certificate. And so too, in death, they have to be certified. Drivers have to be licensed and vehicles submitted for mandatory insurance and road tax or else their owners face civil summonses. Come polling season, local politicians descend upon the village with an arsenal of election promises that leave the village, by and large, back to normal once elections are over.

The village is the basic administrative unit, recognised by the state government, and under the co-leadership of the *Ketua Kampung* and chairman of the *Jawatankuasa Keselamatan dan Kemajuan Kampung* (JKKK) (Village Security and Development Committee) (Appell, 1985; Phelan, 1988) (see Figure 3.5.2). The JKKK chairman is appointed by the District Office in Kota Belud and the post carries the responsibility of coordinating development activities as the liaison between the village and government agencies. The *Ketua Kampung*[12] (village headman) is nominated by the villagers and approved by the District Office. In the village, the *Ketua Kampung* is referred to as *Molohing* (old person), a title that reflects his position as the head of *adat*, and therefore the customary leader of the people (also Phelan, 1988; Pugh-Kitingan, 1989). The *Ketua Kampungs* come under the purveyance of the *Wakil Ketua Anak Negeri* (WKN) or Native Chief representative, who is elected through the District Office. These WKN are the *Ketua Adat* (customary leaders), over and above the authority of the *Ketua Kampungs*, whom, with the jurisdiction of the Native Courts, preside over disputes pertaining to matters of *adat* (Phelan, 1988). In Kiau, the WKN for fifteen years was Sopinggi Ladsou from Kiau Nuluh, but a recent political swing in the District Office saw the post being turned over, in 2000, to Tambunan Asang who is from Kiau Toburi.

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[12] Ketua Kampungs are commonly men although it is not unknown for women to hold the position (Phelan, 1988). In 1998, the Ketua Kampung for Pinawantai (eastern side of Kinbalu) was a woman whose personal trademark was a green beret she wore most of the time I was with her.

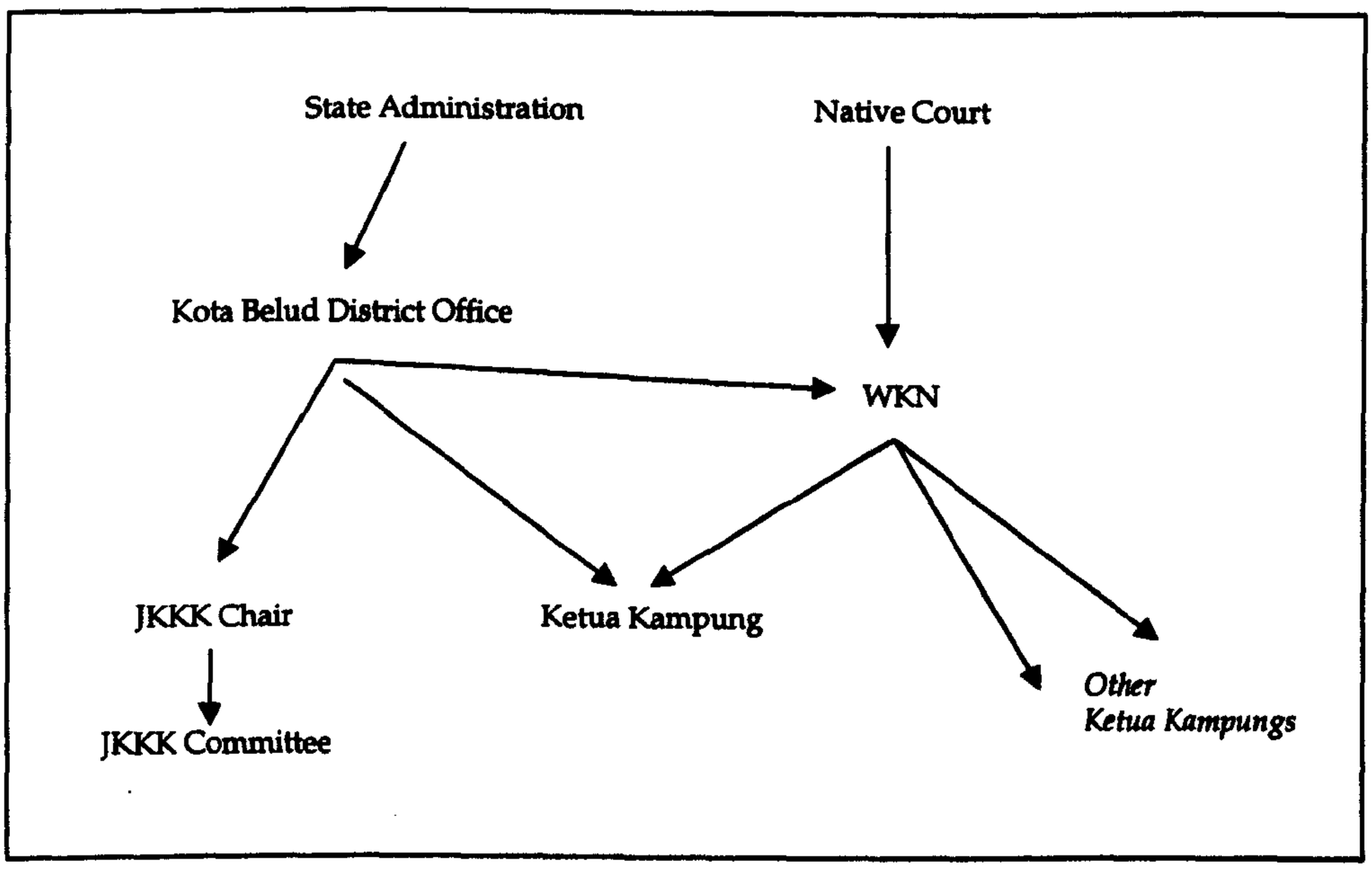

Figure 3.5.2. Illustration of the administrative structure in Kiau Nuluh

It is disappointingly predictable of the state administration, in its attempt to enact the smooth and orderly administration of village affairs, to have imposed a leadership structure onto the village. The position of the *Ketua Kampung*, although still highly respected in the village, has been reduced to a power sharing combination between the JKKK chairman and the WKN (Phelan, 1988). On the one hand, the JKKK chairman has mandate over development activities, while on the other side, the WKN has overriding authority over matters of *adat*. And so the *Ketua Kampung*, the only leader whom the village community actually nominate, is in effect, limited to an advisory role. All three positions are afforded a stipend from state coffers, and these positions can be used as stepping-stones into the wider arena of party politics (Phelan, 1988). Nevertheless, the individual personality dynamics of each leader is crucial in determining the extent to which they are able to exercise their influence, whether on government agencies or the village community. Thus, the potency of village leadership to actually represent the interests of the village community hangs in a delicate balance. In order to be awarded the position, potential leaders need to subscribe to the political disposition of the District Office and the brotherhood of state government. How much this political disposition reflects the interests of the village community, or instead, mirrors a self-seeking sense of political opportunism, is open to question. Furthermore, any effective administration of village affairs relies on the ability of their *Ketua Kampung*, JKKK chairman, and WKN to cooperate and coordinate. Dysfunction often points to the fall-out between the *Ketua Kampung* and the JKKK chairman, whereupon tensions of divisive party politics rapidly come to the fore. And so, with remarkable marksmanship, village

affairs have been structurally married with state party politics, with village leadership being jiggled about as thoroughly as the currents of state politics would permit (see chapter two).

3.5.4.3. This is my land

Rights to land, and property rights in general, is a complex issue that deserves a detailed elaboration far beyond the capacity of this thesis (see also Doolittle, 2001; Mering Ngo, 1996; Nakashima, 1998). What I would like to highlight for this discussion is the layers of tension between pursuing individual gain versus protecting community welfare. In Kiau Nuluh, the village recognises both individual and communal rights to land, a recognition that is rooted in *adat* and upheld through the authority of the *Ketua Kampung*. Today, the expression of rights to land is a combination of state law and *adat*. The law provides the legal basis for land ownership, but *adat*, above all, dictates the codes of conduct on any piece of land (chapter two, section five).

If we were to draw a straight line from Low's Peak to *Hobut* in the middle of Kiau Nuluh, we would cross three different categories of land tenure status. The boundary of Kinabalu National Park cordons off a fully protected area under the jurisdiction of Sabah Parks (chapter two, section six). Outside the park area, land tenure status is a hodge-podge of State Country Land and Native Title (NT) (chapter two, section five). Areas of State Country Land comprise forests that are not under cultivation and areas set aside for village use. Rights to State Country Land remain vested in government and is eligible for entitlement. There are also parts of State Country Land that are not open for entitlement (inalienable) but are entrusted to the administration of the JKKK, such as the built-up village settlements of Kiau Nuluh, Kiau Tomodu, Kiau Toburi, the primary school, and any other areas that are declared for communal use. In this case, it is the village administration, with approval from the relevant government authorities, who set particular conditions that govern the use of these lands. For example, all homes are located on what is considered to be village land or *kawasan kampung*, and an application to reserve any plot of land therein for the erection of a house, or any other personal purpose, does not involve the alienation of the plot but is subject to the approval of village administrative structures. Decisions on the utilisation of village land are made through a process of community consultation spearheaded by the leadership of the JKKK.

State Country Land also includes the area excised from the park following the demarcation of the exact boundary. Duaneh Ladsou, who was the *Ketua Kampung* at the time the area was released, told me that because the area bordered onto Kinabalu Park and had been protected under the park for so long, the village had decided to set the area aside as a village reserve. This meant that it would be kept for future use should any need arise, and thus the area remained largely undisturbed. And yet, today we can see the east of this area has already been granted individual

title, and patches of land bordering directly onto Kinabalu Park have been opened up for cultivation. The bulk of this area however, known as *Lokos Diou*, still remains untitled.

Titled land is the most important land category. NT confers the heritable right to land, and therefore secures the ultimate measure of capital assets for landowners and their descendants (chapter two, section five). Titled land can be passed down to either sons or daughters, although the sons hold favour because it is assumed that a daughter will share the security of her husband's land upon marriage. In the past, villagers regularly baited me with eligible bachelors by professing the large amounts of land these young men own. Today, land is the property of individuals, who decide when to bring it under cultivation or to leave it idle, how to divide it up between their children or whether to sell it. Large family sizes however, and the move towards small-scale estate plantation of rubber, coffee, and pineapples, has increased the demand for more arable land. Coffee plantations fringe the Hugh Low Trail, and a drive to Kiau Tomodu takes us past slope after slope planted with pineapples. Sanan Sulidan has told me that the gravity feed system of the village is under threat because the source areas have been opened up for cultivation.

It is a delicate matter to balance the legal basis for individual land ownership against the social and customary obligation to protect the welfare of the general community. The power of *adat* rests upon mutual respect for customary law and therefore contravention of *adat* is usually seen as a pursuit of individual gain at the expense of greater good. For instance, the integrity of *Lokos Diou* rests primarily on the ability of the community to respect the decision to leave it as a village reserve. According to state law however, *Lokos Diou* was never formally gazetted and therefore remains as State Country Land and is open for entitlement. This contradiction between the legal and customary status of *Lokos Diou* means that individuals who are willing to bear the stigma of self-interest can choose to ignore *adat* and apply for entitlement in *Lokos Diou*. Much in the same way the cultivation of gravity feed source areas threatens the water supply of the village, granting NT inside *Lokos Diou* would override the ability of *adat* to uphold community interests. And because NT is legally binding, we find ourselves in a situation where state law can, and has, been used as a tool to promote and protect individual interests, leaving *adat* powerless to arbitrate. Beyond this, there exists the potential that outside agents could apply for land within *Lokos Diou*, quite simply, by filing an application at the Lands and Survey office in Kota Belud.

Amendments to the Land Ordinance have made it possible to sell or sub-lease NT (chapter two, section five). Coupled with the inflated land prices because of the recent tourism boom around Mount Kinabalu, it has become increasingly common for the land-seller to secure a very tidy profit. In all the Kiau villages, it has been common to sell land to other Dusuns from nearby

villages. Increasingly however, there have been many business prospectors looking to buy land in the scenic and strategically located Kiau. They represent paid up capital far beyond the ability of any competing village buyer, and the temptation to sell off land to outside investors is barely being held in check by the bitter fate of Kundasang. Kundasang is a small rural township about 30 minutes drive east of Kinabalu Park Headquarters, where Dusun villagers had sold their land to outside investors at inflated prices. Thus a strong land holding Chinese population started to take root in the township, opening up a variety of resorts, shops, and temperate vegetable farms. Over time, once the tidy profit had dwindled, these landless Dusun villagers were forced to seek work with their Chinese landowners. The Dusuns became the labour force that toiled on the very same land they used to own, only this time it was for a paltry wage. Quite a number of people in Kiau Nuluh have recounted this tale to me. They feel no profit could ever compensate for landlessness, and this bitter lesson has made Kiau Nuluh more protective of their land ownership, such that any proposed sale to outsiders is seen with great disdain both for the individual and the future tenure of the village as a whole (also Appell, 1985). At the same time, people recognise that the desperation of hard times can empathically cave in to the temptation of securing a vast income from the sale of land.

Some outside investors however, are cunning creatures. Sopinggi Ladsou has told me of several individuals external to the village who would like to seize the tourism potential of Kiau Nuluh. They propose joint ventures with landowners, whereby ownership of land remains vested in the landowner but profits of the enterprise are credited to both the villager and the investor. Tourism activities in the form of a jungle camp have already been established on privately owned land to the east of *Lokos Diou*. Landowners are confronted with a double-edged *parang*. They can capitalise on the value of land as a market commodity and sell it, or they can convert the value of land towards the service industry and become providers of tourism facilities. Both provide prospects of financial gain, but prospects for long-term security remain opaque and leave ambiguous ideas about what their children could inherit. Or, they can continue to use land for subsistence and small scale cash cropping, and, as some people have said, let development pass them by. The select individuals who have the potential to profit from converting land to monetary gain are quick to preach the rhetoric of development, while those who are cautious choose to remind us of *adat*, family values, and community solidarity.

3.5.4.4. Economy

Kiau Nuluh has a composite agrarian economy derived from a combination of subsistence hill and wet rice agriculture and fruit trees, in addition to cash crops such as rubber, vegetables, and pineapples (also Appell, 1985). Most households also have at least one wage earner, whether as house builders, mountain guides or other more formal employment in the park and with

commercial operations. Swidden plots dominate the landscape in Kiau, with swaths of hill rice plots planted even on the most formidably steep slopes, although there are a number of families who also have wet rice fields particularly in the valleyed areas of Lapai and Limbukon (see Plate 3.5.3 here). A swidden plot averages about 2 acres in size and usually belongs to the household family. Plots are planted with one or more of the local hill rice varieties, such as *komokolum, silou-silou,* and *rohuman,* and are interplanted with a variety of crops including *mundok (*tapioca), *jagung* (maize) and a range of beans (e.g. *balatong* or *kalumbatang*). It is common to additionally have smaller plots for vegetables (e.g. *guol* (taro) or *tomboutong* (shallots)) and *sigup* (tobacco). Most families today can afford to buy pesticides, herbicides and fertilisers, which help reduce the workload. The fallow period is roughly three to five years, although families short of land have been known to cut the fallow period down to two years. There are wet rice plantations in the valleys around Kiau, particularly towards Kiau Tomodu. It is worth noting that even in a good harvest, there are families who do not have enough rice to sustain themselves. As such, they have to purchase rice from other families or rely on supplements from relatives and friends.

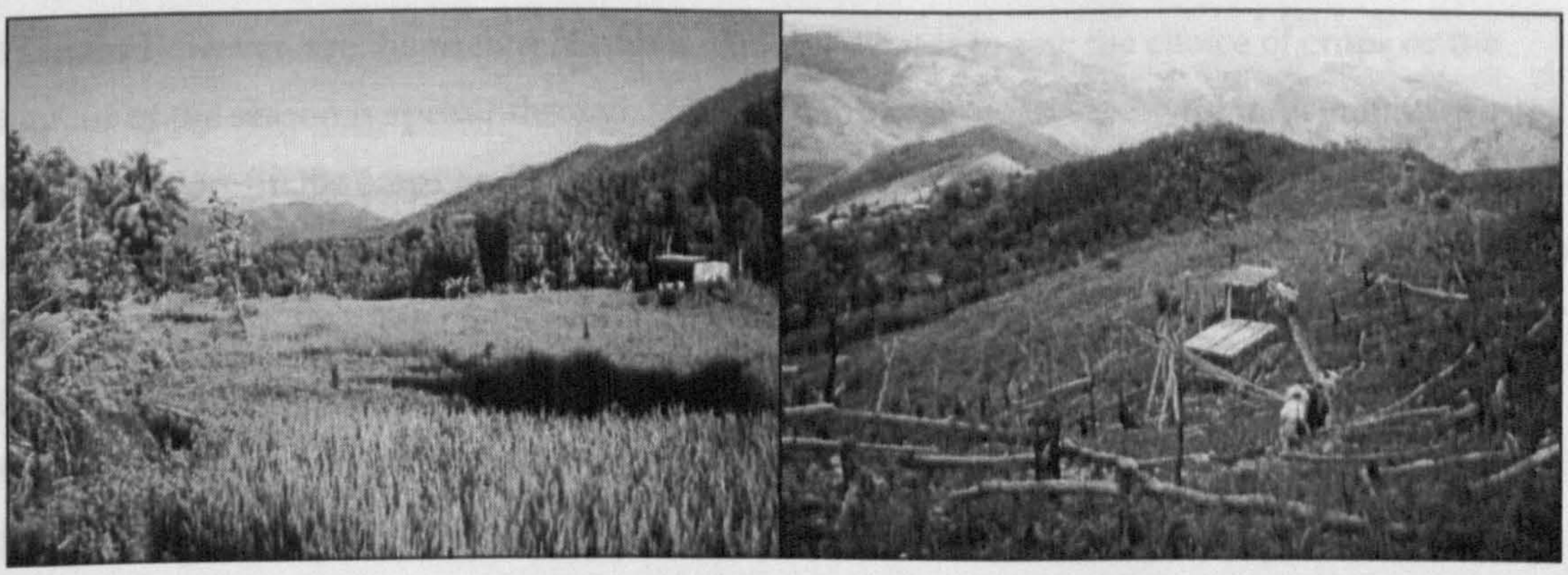

Photo © Jane Suin *Photo © Gampat Soborong*

Plate 3.5.3. Wet rice fields and hill rice plots in Kiau Nuluh (pictures taken August 2000)

Tobacco is still cultivated in Kiau Nuluh today (see Plate 3.5.4), but is no longer the premier cash crop as there has been variety of cash crops over the years, some such as *getah* (rubber), *koko* (cocoa), *kopi* (coffee), and *nanas* (pineapples), most having been stimulated by a round of government subsidies or at least through government encouragement[13].

[13] There are no Dusun names for these crops and they continue to be referred by their Bahasa Malaysia names.

Photo © Bainah Kimbuan *Photo © Sabiah Ladsou* *Photo © Laminah Kihob*

Plate 3.5.4. Tobacco is still cultivated in Kiau Nuluh today but is mainly for domestic use or local markets (pictured l to r: a tobacco plot, cutting up tobacco leaves, drying tobacco leaves; pictures taken from August to September 2000)

Farmers however, are themselves, fashion victims. That is to say, the choice of crops or the flavour of the season is spread through village gossip where farmers share information about potentially profitable crops and copy the kinds of crops planted by other farmers. So while the mainstay of cash cropping revolves around rubber, coffee, pineapples, vegetables and variety of local fruits, there are often "fads" in farming most recently seen in the craze for planting *nanas* (pineapples) and *tomboutong* (shallots). What was first minor experimentation in trying out *tomboutong* has led to a village trend to squeeze *tomboutongs* throughout their plots, even to the point of planting them all the way to the roadside.

To many people in Kiau, the most important *tamus* (markets) are Thursdays at Pekan Nabalu, Saturdays at Kundasang, Mondays at Tamparuli, although some do travel for the Sunday *tamu* at Kota Belud. The Pekan Nabalu Thursday *tamu* was once an important venue for neighbouring villages to converge and trade agricultural produce. Located along the main highway, Pekan Nabalu has become a convenient tourist transit station on the way to Kinabalu Park, and the tourist market is rapidly phasing in the sale of factory made handicrafts[14] and bird's nests[15] at the expense of locally derived produce. Today, there are people coming from as far off as Tambunan to trade *parangs*, Chinese selling meat, Indians selling clothes and trinkets, and the predictable

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[14] A number of stalls at Pekan Nabalu receive their trade goods from a mobile distributor (hence the effect of many stalls selling the same stuff) who have told me that the handicraft factory is in Kudat (about 6 hours' drive to the north of Sabah), or handicrafts are imported from the Philippines and Indonesia. Indeed, some of the handicrafts are even labelled "Philippines".

[15] The birds' nests are renown for their medicinal properties, and have proven to be especially popular, among tourists from Hong Kong, Japan and Taiwan. The proprietor of the birds' nest store at Pekan Nabalu is a Chinese from Sarawak, who sells birds' nests harvested from the Gomantong Caves (about six hours' drive roughly in the direction of Sandakan).

array of souvenir stalls and eateries. Local sellers of agricultural produce have tended to move to the Kundasang market, while others have established supplier contacts with commercial outlets, and others still, sell their produce within the village on a small scale.

Hunting for wild game is now licensed under the Wildlife Enactment, although unlicensed activities are still conducted very surreptitiously by a select few in the village. The main source of animal protein comes from chickens and freshwater fish. Fish rearing is a recent activity in Kiau where man made ponds house a small diversity of local freshwater fish and provide a source of recreational fishing. Chickens are an indispensable fixture of every household although they do not feature in every meal. The domestication of pigs has been outlawed because of the threat of Japanese Encephalitis. Cattle are kept largely as wealth, and spend most of their days grazing around the village compound until their services are called upon to pay the brideprice or feed the banquet. A wedding banquet for instance, will necessitate the slaughter of cows or pigs and often expands to the purchase of livestock and vegetables from village neighbours or local markets.

3.5.4.5. Human resource development

Formal wage labour is perhaps, one of the most obvious trends in Kiau Nuluh with an average of at least one wage earner per household. The main employer is Kinabalu National Park, where people are paid as park rangers, research assistants, clerks, cleaners and even unskilled labourers. The tourism industry surrounding the park means that people hold jobs with tour and transport companies, hotels and restaurants, and mountain guides. Other common forms of employment are as government servants either in schools or the civil service or in local businesses in nearby towns. It is quite common to seek work in Kota Kinabalu and other towns in Sabah, or even as far away as Peninsular Malaysia.

Several people see tourism as the future selling point of Kiau Nuluh, because it is a convenient, logical, and attractive transit point to Kinabalu Park. The interest of foreign agents has successfully established the village-based tourism enterprise using the guesthouse next to the Catholic Church to cater for the backpacker niche market (Daily Express, 2003d). Profits are thus channelled to the Catholic Church and fellow Catholics are usually the ones involved in servicing tourists. In the name of equity, a nominal head tax is paid to the JKKK, towards wider community benefit. However, disgruntled Sidang Injil Borneo (SIB) church-goers dispute the fairness of this enterprise and argue that all villagers should be involved regardless of denomination. A product of such grumbles is the establishment of a competing venture set up by a family with the help of a businessman from Kota Kinabalu. This venture uses a jungle camp

concept (partly in the titled land adjacent to *Lokos Diou*) and have succeeded in entertaining prominent groups such as The Sabah Society and Cathay Pacific Airlines (Kan, 2002).

So far, village-based tourism has raised two main issues: equity and value added forests. Both the church lodge and the jungle camp have their own share of equity problems because there is always some faction of the village that is left out of either enterprise. As a result, people tend to conjure up individualistic enterprises in order to secure benefits for their own faction, making the fragmentation of the community a certainty. A common agreement however, is that tourism provides extra value to their forests. Rather than open land for swiddens, it is becoming increasingly popular to value forested land for its tourism potential. There is some fear that individuals will seek NT in the village reserve of *Lokos Diou*, and convert it for tourism by developing lodges or camps, without the equitable sharing of benefits to the wider community. There is also fear that land converted to tourism will not provide long-term sustainability vis a vis the large amounts of capital costs involved, and the consequence of having less land for subsistence. Thus, much of the tourism potential in Kiau remains village speculation, although it seems quite likely to me that more and more village-based ventures will appear over time.

The increasing number of wage earners in the village has also brought about the prioritisation of education, whether vocational training or academic qualifications. Primary education (ages seven to twelve) is compulsory by Malaysian law. In Kiau, there are about 220 children, from the three villages, who attend Sekolah Kebangsaan (SK) Kiau, the local primary at *Bubukon*, on the banks of the Kadamaian (see Plate 3.5.5). It is a government-funded primary school and thus there is no charge on tuition and students receive regular subsidies.

Photo © Sanan Sulidan

Plate 3.5.5. The primary school in Kiau located along the banks of the Kadamaian River and is about 30 minutes downhill walk from Kiau Nuluh (picture taken August 2000)

There are currently 14 teachers, most of whom come from Kiau. The medium of teaching is officially Bahasa Malaysia (Pugh-Kitingan, 1989), but in practice people tend to speak a mix of Bahasa Malaysia and Dusun. SK Kiau has also been included in the KLF program to teach the Kadazandusun language in primary schools (chapter two, section four). The recent national directive to implement, at all levels of education, the teaching of Maths and Science subjects in English (Daily Express, 2002b) has sparked a mild panic among the teachers of SK Kiau. Sanan Sulidan, a teacher at SK Kiau, has told me that teachers in SK Kiau fear that their inability to speak English properly will only hamper the chances of children to excel in Maths and Science and serve to widen the gap between rural and urban schools. It is nonetheless an interesting approach to teaching, particularly in rural schools, because of the emphasis on using interactive computer-aided software in classrooms.

Completing secondary school has become an important achievement to both parents and their children, but the lack of secondary school facilities in Kiau means that teenagers (ages thirteen to about eighteen) have to attend boarding school elsewhere (usually at Bundu Tuhan, Kundasang or Narinang in Kota Belud) (also Pugh-Kitingan, 1989). The selection of secondary schools for parents in Kiau is usually government-funded schools, but these still incur some costs for living expenses. Some parents, like Ginik Lunsin, face heavy financial demands at the start of every school year as a result of increasing costs for textbooks, sports apparel and other activities in the co-curricula. At the start of 2003, Ginik has four children going to secondary school and he debates the affordability of being able to educate all of his children for future years. The burden is even more dramatic when so many young people aspire to attain tertiary qualifications, such

that most of them have to depend on the help of government scholarships, which are themselves very difficult to secure. At the moment, there are a select few who do possess a diploma or higher degree, with many others currently completing their courses at training colleges, polytechnics, and the local university at Kota Kinabalu.

The effect of education has already started to ripple throughout Kiau Nuluh. I happen to know a few wage earning adults who have embarked on distance learning degree or diploma courses with local universities, as well as the few who are on a hiatus from their jobs to attend university full-time– their rationale being one of boosting their current employment status with formal qualifications. It is truly very easy, for me, to visualise how the multi-lingual components of the educational curriculum (Bahasa Malaysia, English, Kadazandusun in addition to the Dusun dialect spoken at home) and the recent emphasis on Maths and Science subjects could build a young population in Kiau who aspire to ambitions very different from the subsistence farming mainstay of their parents. Certainly, there are already parents in the village who feel left-behind in comparison to, and in a sense overwhelmed by, their children's educational experience.[16] It is uncertain whether qualified people will then leave the village to work in urban centres and thus lead the brain drain of their village. Or, whether they will contribute directly to the welfare of their community by developing village-based ventures in tourism or smallholder supply of agricultural products. What is clear at present is that wage labour and education represent a significant shift away from farming (Appell, 1985). Duaneh Ladsou and his wife Sandian are in their 50s and have nine children. The youngest two are in secondary school with ambitions to enter tertiary institutions. One son has recently completed a business diploma from Sarawak, thanks to a concerted family effort to pool their financial resources. The other children are either wage earners or married to wage earners. It is uncertain in what form farming can continue once Duaneh and Sandian are no longer able to carry the physical burden of agricultural tasks.

3.5.5. Social groups

The trends in political administration, land conversion, and human resource development, pose a flurry of questions about the integrity of the village. Indeed, there is the real possibility for the village to fragment and dissolve into mainstream society. However, where some existing institutions and skills diminish, others social institutions are transformed and even created to support the community as part of the overall transition. And so, when we look at practices such as intermarriage, the celebration of the harvest festival, and even alcohol consumption, we can see how the potential for fragmentation is part of the parlay of social integration, just on the other side of the same coin.

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[16] But first and foremost, parents are endlessly proud of their children's educational achievements.

3.5.5.1. The Dusun person

The Kiau Dusuns are just that: Dusuns who come from Kiau. This is an important qualification because it is an explicit affirmation of the unique Kiau-specific qualities that imbue their perception of Dusun-ness as distinct from all other Dusun groups in Sabah. Time and time again, I have been "lectured" on the "obvious" differences between a Kiau Dusun and a Tambunan or Penampang Kadazan[17], whether in dialect, dress or drink. In spite of this, the Kiau man or woman is dressed in the most contemporary fashion, and aside from the elderly villagers who only speak Dusun, they are fluent in both Dusun and Bahasa Malaysia, with a growing number being able to speak English (also Florey, 1991; King; 1993).

Individuals belong to a range of social groups starting with the most basic family unit to groups categorised according to age, gender, occupation, education and Christian denomination. Groups can also vary according to their perceptions on how to secure the future of the village, either through party politics, tourism, cash cropping, forest conservation, cultural revival, or university degrees, making the community a crucible of energetic ideas.

3.5.5.2. The family

The nuclear family comprises parents and their children, although it is the extended household family that forms the basic social unit. The Kiau Dusun are bilineal and there are no strict rules regarding residence patterns, although it is generally patrilocal. In cases where the husband does not own a house, or the husband's family's house has no extra room, or the husband is living away from the village, then residence may be with the wife's family. The strength of the church (and lack of a village medical clinic) means that artificial contraception is not widely practised, and thus it is common for couples to bear children year after year. Today, much like before, the household family is the basic unit of production and consumption (also Appell, 1985). Families are entrenched in their daily resolution of chores only to return home in the late afternoon for the evening meal and some rest. Swidden farming is still family farming. The harvest is usually done by as many able bodied family members as possible, and thus the timing of the swidden cycle for some families can coincide more with the school term so that the harvest will happen during school holidays when children are home to help. Wage earners can be male or female, although all mountain guides are men. The women mix freely with the men, and the task of child rearing is quite affectionately shared between both parents. Other domestic chores can also be shared, and it has been my experience of watching husbands cook and clean so their wives can have a rest. Children mix comfortably with each other, the younger ones all attending the same primary school, and the older ones go in groups to boarding schools.

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[17] Tambunan and Penampang are chosen as examples because these areas represent the heartland of Kadazans (and to some degree, of Kadazandusun*ism*).

3.5.5.3. The community

Families are part of the wider village network, whether it is in exchanging agricultural produce, sharing transportation, participating in *gotong-royong* (communal labour), partaking in village decision-making, or the simple exchange of gossip. What at first glance looks like a collection of independent family units and their different vocations, in fact reveals a substantial degree of community, and thus, social integration in this village. Social integration in this sense does not equal social unity because the different vocations, religious affiliations, evident levels of stratification and intermittent influence of state based party politics, does produce tensions and divisions within the community. There are however, important institutions of social contact that specifically enable people to regularly interact, communicate and relate, all of which perpetuate an overall community commitment to the village as a whole.

3.5.5.4. Intermarriage

Marriage is a strong proponent of social integration, there being a high degree of intermarriage between almost every family in the village. Today marriage is an arrangement between the couple although the consent of both families is required before the marriage can proceed. Traditionally, marriage is not permitted between couples that are related by at least seven degrees of parallel or cross cousin marriage. For each degree a *sogit* (penalty) would be levied, which would be agreed upon through council with the *Ketua Kampung*, WKN and village elders. There have been cases of marriage between cousins as close as the third degree thus incurring a hefty *sogit*, usually in the form of livestock and money, to be paid in addition to the brideprice. The composition of both the *sogit* and brideprice place a mixed emphasis on traditional items such as gongs and jars, in addition to modern day market items and money (also Pugh-Kitingan, 1989). These days, marriage is officiated by the church, primarily by virtue of religious conviction, but also because the church undertakes the registration of matrimony with the State Registry. Marriage with people from other villages is common, and the relaxed rules of residence mean there is a lot of migration and continued travel between villages. Marriage binds families together through a continuous reciprocal exchange of property, goods and labour, and over generations of intermarriage, the village is one big extended family.

The wedding celebration is the cornerstone of family merry making and reinforces family solidarity with the wider community. The grandness of a wedding party is measured weeks in advance by statements about the volumes of *tapai* (rice wine) and the quantities of livestock that have gone into the banquet preparations. The party is customarily hosted by the groom's family, although I have attended a party hosted by the bride's family because they have the larger lawn space for the wedding tent. A wedding ceremony today usually has the groom dressed in a suit

and tie, while the bride adorns a flowing white gown[18]. An entire day of eating and drinking is open to the entire village, often including the residents of Kiau Tomodu, Kiau Toburi and other neighbouring villages. It is the duty of a good host to *additionally* provide styrofoam containers and plastic spoons so that guests may pack a take home portion. Music is an essential component to the celebration with gongs accompanying the *sumayau* (bird dance) and general merry making. A recent addition to the festivities is the local rock band (performers are from nearby villages) complete with electric guitar, drums and amplifiers (also Pugh-Kitingan, 1989). Everyone gets a chance at the microphone.

3.5.5.5. A matter of faith

In addition to *adat,* Christianity guides the codes of conduct in the community, and has become as much of their identity as being a Kiau Dusun. In earlier days, the conversion to Catholicism or SIB was a matter of personal choice, and thus today there are members of a nuclear family that belong to different denominations. Today however, the children adopt the denomination of their parents, and in the case where parents belong to different churches, the parents will decide which denomination to follow. Although there were a few conversions to Islam during the Mustapha era (chapter two, section two), there has been a reversal of faith, and the village is now predominantly Christian. Because there are two denominations, sometimes the church can divide the community rather than unite them. In the case of tourism, much of the rumbling has centred on the Catholic monopoly of the backpacker tourists. In the case of alcohol consumption we have: Catholic church-goers who drink, SIB church-goers who, as a general rule, don't drink, and non-church-goers who drink any which way they please. The mores of alcohol consumption are sometimes hotly debated, but often *tradition* has priority, and I have been to SIB wedding banquets where rivulets of *tapai* flow regardless of denomination.

3.5.5.6. Cultural revival

The *Kaamatan* (harvest festival) is a community celebration to mark the conclusion of the swidden year, and is, perhaps, one of the most important events in promoting community solidarity. The festival is held annually on the 30th and 31st of May and is a designated official state-wide public holiday. This means that villagers who have been away for employment and education have the opportunity, and often do, return home to the village making it a time of undisputable good humour and fellowship typically characterised by consumption of rice wine with drinking parties held in a rotation of visitations from one house to another.

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[18] I have also been to weddings where the dress is styled traditionally, but these costumes are more akin to the dress styles (and colours) of the Tambunan and Penampang costumes. The only wedding I have attended where the dress is styled according to Kiau Dusun costumes is that of Geoffary and Linah (discussed earlier), where the plain black costumes of both bride and groom present an elegant contrast to the golden trimmings and glitter of Tambunan and Penampang dress.

In 2000, GOMPITO[19] was formed as a community-based and community-controlled organisation with an interest in researching and developing the culture of the Kiau Dusuns. One of its aims is the cultural revival of traditions, skills and indigenous knowledge by organising activities for the village. GOMPITO organised the most recent festival held in May 2002, which took an interesting twist. In addition to the usual house-to-house rotation, GOMPITO organised a centralised village celebration held at the *dewan*. It was declared a *Perayaan Orang Asal* (celebration of indigenous culture) with events ranging from games, traditional costume, *mengagung* (gong beating), traditional house building, and of course, rice wine drinking. It spurred the participation of all ages in a celebration of traditional dress, dance, and sportsmanship. Interestingly, it also became an event that spurred the transmission of skills such as traditional house building, where children were specifically encouraged to learn how to stitch *atap* leaves, tie rattan bindings, prepare traditional foods, and participate in the reconstruction of interior household goods, and thus garner an understanding of past lifestyles. Similarly, the *mengagung* competition was purely a children's contest, where teams of seven children had to learn how to beat the gongs (and one drum) according to a *rentak asli Kiau* (rhythm originating from Kiau), some of them having practiced for more than two months. Crucially, GOMPITO placed significant emphasis on revitalising Kiau-specific traditions, also seen in the traditional costume contest, with many people, old and young, dressed in traditional costume. It was indeed revealing to observe that only a minority of people were able to reconstruct the dress that was worn in Kiau past. It was the women who showcased their *lamba* skirts strung with brass bells, trade cloth skirts, cowls, brass chains, beads, and chains of Chartered Company currency. The men, quite remarkably, were dressed in factory made Kadazan costumes of the Penampang and Tambunan regions (also Pugh-Kitingan, 1989). It is, perhaps, a clever image of how the men, being the primary characters involved in state party politics, are more exposed and therefore open to the wider currents of Kadazandusun constructionism.

One of the highlights at this festival was the marriage of Geoffary Gunsalam and Linah Dalansu, two key office bearers of GOMPITO, who decided to conduct their wedding as a reconstruction of traditional wedding ceremonies. Village elders were consulted to compile information on the sequence of wedding procedures (this chapter, section three) in an attempt to rekindle old customs. The significant modern additions were the video documentation, and the fact that the marriage would not be official until after the private church ceremony to be conducted some weeks later. The irony is compounded by noting that the level of cultural awareness raised because of this wedding is, perhaps, equally remarkable to the level of uncertainty in the reconstructing the wedding ceremonies with plenty of discussion as to which procedure is

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[19] GOMPITO stands for *Momogompi Monigolig Sinakagon Tokou*, which literally translated, means to guard and protect the heritage of our community.

supposed to happen next. Another wedding, between David and Dalilah Duaneh, which took place two days before, decided to stick with the white wedding gown and rock band formula.

The formation of GOMPITO has sparked a substantial degree of excitement in the community, and its voluntary office bearers represent a cross section of people interested in balancing development with cultural integrity. GOMPITO originated from the village involvement with a WWF Malaysia ethnobotanical project in Kiau Nuluh, which examined links between local people and forest resource use (chapter two, section six). In 2001, GOMPITO was officially registered with the Registrar of Societies, became an organisational member of the KDCA[20], and has gone on to work with a small network of partner NGOs[21]. GOMPITO has hosted a KLF[22] language workshop held in Kiau Nuluh to discuss methods of documentation in the Kiau Dusun dialect as part of GOMPITO's desire to record the folk tales in Kiau. They have also been working closely with PACOS[23] (a local NGO based in Kota Kinabalu) on community development issues such as supporting socio-economic development through organic farming methods. Of the 74 household families in Kiau Nuluh, 60 families have registered with GOMPITO, at a one-off entrance fee of RM 5 per family followed by a monthly subscription fee of RM 0.50. Currently, GOMPITO has succeeded in securing a Planning Grant from the UNDP GEF[24] Small Grants Programme to help them draw up a full two-year project proposal to support community-based forestry issues in *Lokos Diou*. GOMPITO is still a very young initiative, but the enthusiastic support of the community is certainly an encouraging indicator of future times to come.

3.5.5.7. *Moginum*

A final note on social integration is about *moginum* (drinking alcohol). The Kiau Dusun still are formidable drinkers of *tapai* and *lihing* (fermented rice wine), *montoku* (distilled rice wine), *bahar* (Whitehead's *tuak* or coconut wine), and now of beer, Guinness, whiskey, gin, and pretty much any alcoholic beverage. The intensity of alcohol consumption is shared by men and women alike, a number of elderly women being fastidious drinkers. When we consider that drinking has been part of the Kiau Dusun for more than 150 years, it should come as no surprise that alcohol consumption is seen as their normal way of life. Tensions do arise as a result of the SIB edict against alcohol consumption, but these are often, and sometimes very conveniently, swept under by arguments that support *moginum* as the "oldest tradition" and thus an undeniable marker of true Kiau Dusun-ness. There are certainly people who are faithful to the edict against alcohol, and these are people who I have observed participating in social events as vicarious

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[20] Kadazandusun Cultural Association
[21] Non-government organisations
[22] Kadazandusun Language Foundation
[23] Partners for Community Organisations
[24] United Nations Development Program Global Environment Facility

drinkers. Drinking is a social occasion, and is the primary venue for people to catch up after a day of work. It is conducted in small groups who congregate at various houses, rotating from time to time between houses, and can start as early as 3 pm, making cogent participant observation a near impossibility from thereon. On Sundays, drinking cells can start as early as 1pm running through the rest of the day. Inevitably, social and political alliances do influence the composition of drinking cells, and to the alcohol resistant fieldworker, invites a fascinating study of cost-benefit relations (Dove, 1988). Drinking at weddings and festivals, however, does present an open invitation for the inebriation of all sorts of village characters. Drunkenness is inevitable although it continues to astound me the level to which a Dusun is able to continue being drunk without ever needing to vomit (see also Dove, 1988). Drunkenness is seen in the most benevolent humour, being an affliction almost everyone has personally endured at some time or other, and thus a drunken person is integrated into the social occasion as a part of the entertainment rather than being discarded in disgrace. As Whitehead (1991) observed, drinking makes the Dusun far more sociable, and it is for this reason that I contend drinking occasions are an important basis of social integration in Kiau Nuluh because the parlay of mutual intoxication encourages wounds to heal and bonds to strengthen.

3.5.5.8. The future is now

When we look at the dynamism of Kiau today in relation to the pot of activity that was Kiau past, it is tempting to conclude that the village is in a continuous state of transition. Social change, in this sense, is an ongoing dialogue between processes that are external and internal to the village. The Kiau Dusuns today are as much recipients of new regimes as they are active and creative proponents of change (also King, 1993). There is therefore, a constant movement of ideas and people, in and out of the village. Crucially, the potential of external forces to exert change reveals that the village is indeed part of a dynamic wider social and political web. When external forces interact with the village, change is absorbed and enacted at varying levels reflected, to a large degree, in the levels of stratification, whether is it gender, age, philosophy, occupation, education, money or party politics. Herein lies the challenge. The Kiau Dusuns have had to maintain a degree of cohesion while at the same time grappling with the elements of change and the internal segmentation of the community. It is this cohesion, through the various institutions and practices I have described above, that binds the community. Otherwise, the village would have split into various fragments, and ceased to exist as a single entity. The village of Kiau Nuluh today, still stands where it was 150 years ago. Over the years, its residents continue to be tugged in various directions at different magnitudes by the forces of change. Some have left the village to pursue a different life. Others, however, remain.

SECTION SIX: FUTURE DIRECTIONS

3.6.1. Signs of the times

Quite frankly, Kiau Nuluh today, is as much at the crossroads of the new century as it was 100 years ago in 1902. Over these years the Kiau Dusuns have been actively navigating the currents of wider political rule, cash cropping and trade, and been open to foreign visitors and their ideas. Today, they flirt with cultural mainstreaming and the currents of globalisation. Tomorrow, there will be something else. They are, literally speaking, perpetually on the brink of change. Change therefore, is not so much a result of recent 20th century development in Sabah as it is the inherent propensity of the community to interact with their surroundings over years and years and years. The boundaries of tradition and modernity are infused in a continuum of change over time in this one space of Kiau Nuluh. And so, while the elements of change do fluctuate in their nature and intensity, it is the momentum of change itself that has been an integral characteristic of the community.

To return to a point I raised at the beginning of chapter two, this thesis does not make a value judgement on recent changes. It is for this reason that I have dedicated chapter two to a discussion of the wider forces of change, looking at the implications of state administration, cultural mainstreaming, conservation, and development. And then, with a poetic sense of justice, we debunk any preconceived notion about the imposition of wider forces of change, by showing, in this chapter, how change is enacted when translated to a localised force. GOMPITO, for instance, represents an impressive degree of community consciousness and a desire to understand the implications of their actions on their environment and culture. They seem to convey a realisation that the seemingly forceful currents of wider forces can be curbed, cultured, and even overturned, by the community themselves. In the same way, the community can capitalise on opportunities in the wider network, for example, by using GOMPITO as a community-based NGO to inspire other villages to do the same. The complexity of interactions between wider and localised forces is a fascinating area of study, which for our purposes, shows this: that 20th century development is not so much the oppressor of indigenous culture and knowledge, but quite simply, a pathway of choices that history has recently produced.

There are no answers for the future of Kiau. The purpose of this chapter is to tease out the key elements of change that have the potential to impact upon, and be shaped by, their indigenous knowledge. I contend that the general trends today of party politics and state administration, agricultural transformation and land conversion to value added forests, development of human resources through wage labour and education, and even tourism, represent the key elements of change in Kiau today, as they could have well been for Kiau past. They form the potential

channels where community members are not just re-actors to an imposed development agenda, but are the actors and agents of social change in an organic process that has been unfolding for a long time. Knowledge therefore, will reflect this reality; in as much as it will reflect the way different segments of the community wish to enact change in different ways. In this sense, I extrapolate that 150 years ago in Kiau past, there were already aspects of knowledge that had become dormant because of changes in their community and surrounding environment. We also know there was a growth of knowledge by the addition and development of the ceremonial summit offering. In Kiau today, because of changes brought about by, say, the church, knowledge of the ceremonial summit offering is rapidly diminishing. It should thus come as no surprise that variations in knowledge reflect the levels of change within the community, and therefore, these key elements of change today will provide a valuable context within which, knowledge itself is changing.

CHAPTER FOUR: NATIVE SCIENTIST OR NAÏVE SAVAGE

SECTION ONE: A QUESTION OF APPROACH

4.1.1. Objectives explained

In chapter one I presented the theoretical framework for my research. In sum, I argue that plant knowledge is context-bound in three ways: by framing the context of the object of perception (*domain of thought*), by framing context of the perceiver (*eye of the beholder*), and by being bound to reality itself (*principle of fit*). In chapters two and three I argued how historical processes, whether in the wider or local community, have shaped the reality of Kiau and continues to frame the contexts, social or biological, of these people and their plant world. Having reconstructed these historical processes, I now undertake the final task of this research: to explore the contemporary status of plant knowledge as part of a larger contextual analysis (see Table 4.1.1). Specifically, I examine the distribution of a particular subset of plant knowledge, that is what different groups of people know about the names, life forms[1], and uses of different plants. I anticipate that these results will illuminate a much wider enquiry into the character of Kiau Dusun plant knowledge that covers the intellectual, cultural, economic and practical aspects of human interaction with the plant world.

Table 4.1.1. Major components of investigation

OBJECTIVE	APPROACH
1. Establish the status of plant knowledge	• Examine how plants are conceptualised and used by different people in the community, • Assess how variation in plant knowledge are related to contextual variables
2. Establish the status of forest significance	• Examine the significance of plant habitats for different people in the community, • Assess what kind of role/s the forests around Kiau have for the people of Kiau.

At this stage, it is crucial to note that the research results presented in this chapter are constrained largely by my overall approach. I employ a contextual analysis to understanding variations in Kiau Dusun plant knowledge, which rests on two fundamental assumptions. First, and to return to the context dependency background I discussed in chapter one, the measure of plant knowledge is primarily a measure of expression. Second, the contexts that frame expression are grounded in normative reality that it is, in itself, an ongoing series of, often,

[1] I use the term life form to refer to the folk classification of plants according to life form categories as described by Berlin (1992). The term life form also corresponds to what botanists refer to as stem habit, o the morphological characteristics of a plant's stem

parallel processes taking place across time and space, with the Kiau Dusuns as active participants. The methodological approaches and subsequent analyses presented in this chapter are a reflective and exploratory account of Kiau Dusun knowledge about plants. In other words, I will not present a definitive[2] description of Kiau Dusun plant knowledge. On the contrary, my data illuminate the *domain of thought* argument, which suggests that any expression of plant knowledge is the explicit reflection of a particularised Kiau Dusun interaction with their human and natural ecology. In fact, the integrity of my research rests upon exploring the rough edges, gaps, missing links, and irregularities in how the Kiau Dusun express their plant knowledge. Questions arise as to how feasible it is to identify such gaps in knowledge without an *a priori* understanding of what comprises the whole of Kiau Dusun plant knowledge. This is, perhaps, the strongest significance of my research, in that a contextual analysis reveals how knowledge is fluid and while some parts may remain constant, other aspects of knowledge are dynamic and constantly changing process. In other words, it is these rough edges, gaps, missing links, and irregularities that comprise the very richness of variation in knowledge that help to construct an understanding of how various groups within the Kiau Dusun community, and the community itself, interact with and react to their surrounding human and natural environments.

I feel aspects of this research, particularly the data on variations in Kiau Dusun classification of plants, will be a useful contribution to larger projects such as the *Dusun Ethnoflora* (Martin *et al.*, 2002) that attempt to trace elements of the whole of Dusun plant knowledge. The Kiau Dusun, after all, are but one group of many other Dusun villages within the larger framework of Dusun communities living around Kinabalu. Contextualising variations in Kiau Dusun plant knowledge within the wider framework of Dusun plant knowledge will enable a comparative and deeper understanding of Dusun conceptualisations of plants. This thesis, therefore, is a preliminary and preparatory account of a much larger enquiry about the substance and form of Dusun plant knowledge. The statistical analyses presented in this chapter are exploratory steps in identifying possible root causes of variation in Kiau Dusun plant knowledge. From this, I expect to predict some future directions for research and addressing variations in Dusun plant knowledge given the contemporary trends in the wider and local social fabric.

This chapter is divided into three sections. The first section outlines the rationale for my methodological approaches. The second section is the main part of this chapter, and deals with surveys conducted from 1998 to 2002. These surveys complement the body of qualitative data that I collected through participant observation, interviews, and archival research, also within the same timeframe. As part of mapping historical processes, I have integrated the qualitative

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[2] Indeed, any claim to a definitive Kiau Dusun plant knowledge risks the same assumptions Berlin (1992) makes, that plant conceptualisations are "out there" in some absolute form that people are universally able to discern. It is a claim that forsakes the very complexities within which plant knowledge is derived, interpreted, internalised, remembered, expressed, and has little room for change to be considered as a normative part of knowledge maintenance.

data throughout the entire dissertation, delivering the flavour of much of chapters two and three. The third section of this chapter draws some preliminary conclusions about the status of Kiau Dusun plant knowledge.

4.1.2. Approach

This dissertation comprised six methodological techniques (see Table 4.1.2). Techniques five and six were conducted off-site (not in Kiau): archival research and dialogues with agencies in Sabah, and observations with other local communities in Sabah. Their purpose was to obtain an appreciation of the Kiau Dusun within their wider context. The bulk of my fieldwork was on-site, that is, conducted in Kiau or with the Kiau Dusun, where participant observation (technique one) was my main methodological approach, whose results are presented throughout this dissertation.

Table 4.1.2. Fieldwork techniques

Technique	Description
1. Participant observation with the Kiau Dusun	Collection of ethnographic data, structured and semi-structured interviews, compilation of oral histories, and direct observation.
2. Plant manual exercise	Survey of plants that are prioritised by Dusun communities around Kinabalu (including Kiau)
3. Plant trail test	Survey of knowledge about plant names and uses among Dusun communities around Kinabalu (including Kiau)
4. Household survey	Survey of domestic economy in Kiau Nuluh
5. Archival research and dialogues with local agencies	Literature review and interviews with government officials (e.g. Sabah Parks) and researchers in local agencies (e.g. Kadazandusun Language Foundation)
6. Observation in other communities	Visits and discussions with other villages about plant knowledge issues and other contemporary community issues (e.g. land tenure, tourism, agriculture, and the weather)

In this chapter, I present the results of techniques two to four (see Table 4.1.2). First, the Plant Manual survey aimed to define the scope of my research, specifically to select a sample of informants and to select a range of plants as experimental stimuli. Second, the Plant Trail survey aimed to examine, in detail, the knowledge of plant names and uses of a specified sample of plants by way of a free listing exercise and semi-structured interviewing of a sample of informants from around Kinabalu. Third, the Household survey aimed to gather socio-economic data from a range of randomly selected families in Kiau Nuluh. Without exception, information was divulged to me on a voluntary basis.

SECTION TWO: SURVEYS

4.2.1. Structure

This section is divided into four parts to discuss the three surveys: Plant Manual, Plant Trail and Household survey. Although these surveys are presented in chronological order, much of the data has been revisited at different stages with various people in Kiau Nuluh, whereby some part of the clarification and elaboration of data has already been discussed in the preceding chapters. Each of the following parts comprises a discussion of the synopsis, process and conclusions of the survey.

4.2.2. Part One: Plant manual exercise

4.2.2.1. Synopsis

In February 1998 I conducted a data collection exercise as part of my assignment with WWF Malaysia. The task was to compile an ethnobotanical plant manual that describes plants considered to be important by Dusun communities around the Kinabalu area, primarily, by building upon the experiences of villages that have been involved in the PEK (see chapter two, section six). For the purposes of this dissertation, the Plant Manual exercise enabled me to obtain a baseline understanding of the kinds of plants important to Dusuns around Kinabalu (see Table 4.2.1). Preliminary discussions with various communities revealed an interest in documenting the uses of medicinal plants because many informants admitted they seldom use medicinal plants in their day-to-day lives and felt this knowledge needed to be recorded before it is forgotten.

Table 4.2.1. Plant Manual: Synopsis

WHY?	To obtain an understanding of which plants are considered to be important by Dusun communities around Kinabalu
WHAT?	Prioritise and list medicinal plants that are important, and describe how they are used
WHO?	120 Dusun men and women; from 20 villages
WHERE?	Various locations around Kinabalu

The entire process of collecting and verifying data took about eight months, with the involvement of twenty Dusun villages. Of these twenty villages, seven villages had been involved in PEK collections, but because collections were made in the areas surrounding each village, I decided to extend this exercise to neighbouring villages that shared access to the areas where collections were made (see Figure 4.2.1).

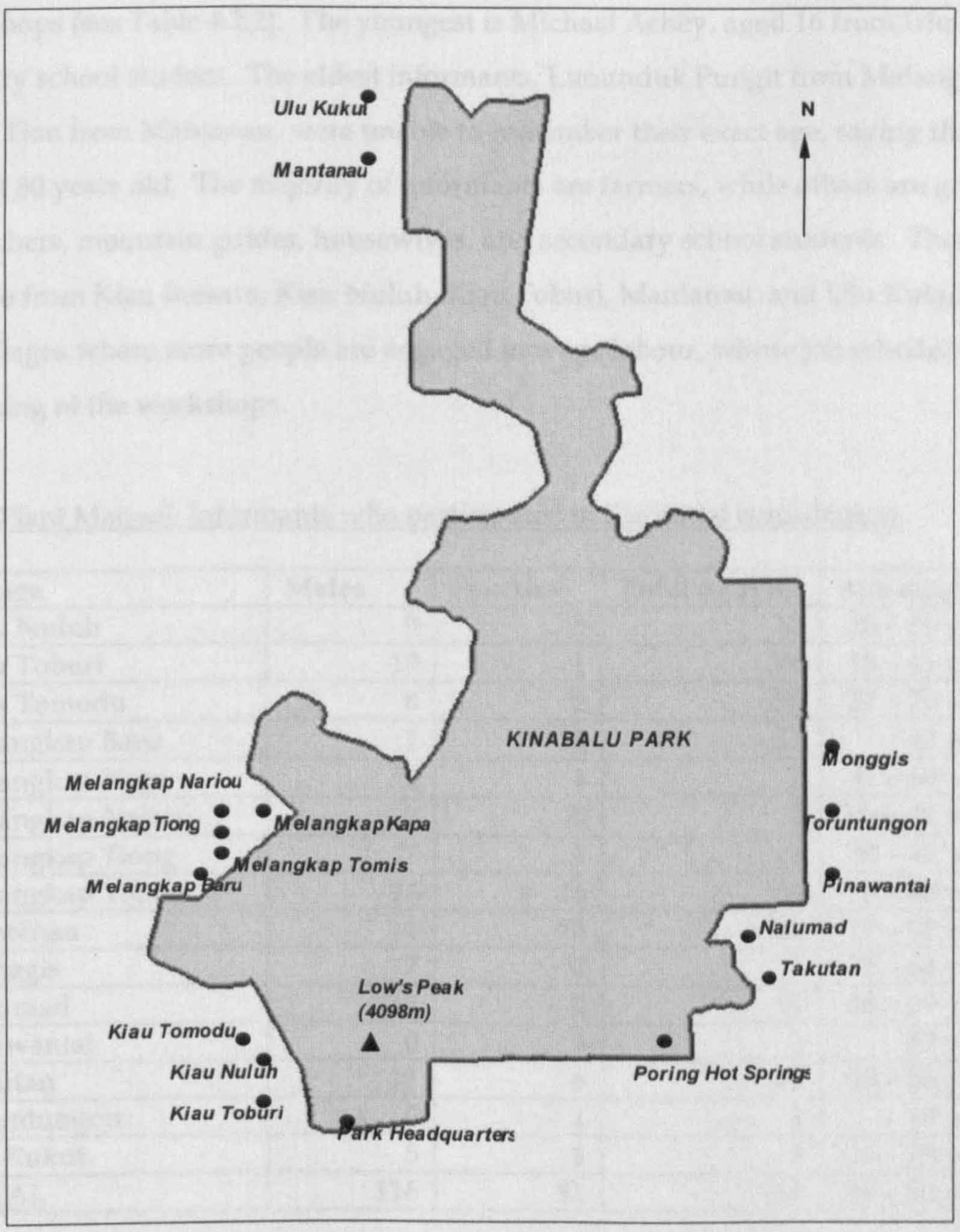

Figure 4.2.1. Plant Manual: Participating Dusun villages around Kinabalu Park (not to scale)

The participating villages ranged in terms of accessibility to commercial centres, dependency on subsistence agriculture, formal wage labour and local markets, and tourism. The Melangkap and Kiau villages share the history of being involved in early scientific expeditions (Whitehead, 1991), and Kiau is currently the closest village to Kinabalu Park where a number of people hold full or part-time jobs. Kiau Nuluh was the only village, at that particular point in time, to have its own tourism initiative.

4.2.2.2. Process

The initial consultation was conducted over two weeks through four community workshops held in Mantanau, Melangkap Tomis, Nalumad and Kiau Toburi. From the start, key village representatives took the lead in compiling information from their respective villages, whereupon there was limited facilitation on my part. There were 167 men and women who participated in

these workshops (see Table 4.2.2). The youngest is Michael Achey, aged 16 from Ulu Kukut who is a secondary school student. The eldest informants, Limunduk Pungit from Melangkap Tomis and Pongot Tion from Mantanau, were unable to remember their exact age, saying that they were at least 80 years old. The majority of informants are farmers, while others are government officers, teachers, mountain guides, housewives, and secondary school students. There were fewer people from Kiau Bersatu, Kiau Nuluh, Kiau Toburi, Mantanau, and Ulu Kukut because these are villages where more people are engaged in wage labour, whose job schedules clashed with the timing of the workshops.

Table 4.2.2. Plant Manual: Informants who participated in the initial consultation

Village	Males	Females	Total number	Age range
Kiau Nuluh	9	3	12	25 – 66 years
Kiau Toburi	10	1	11	18 – 41 years
Kiau Tomodu	8	2	10	27 – 70 years
Melangkap Baru	1	0	1	42 years
Melangkap Kapa	6	1	7	31 – 60 years
Melangkap Nariou	2	0	2	35 & 41 years
Melangkap Tiong	7	1	8	30 – 42 years
Melangkap Tomis	16	14	30	29 – 80 years
Mantanau	11	18	29	17 – 80 years
Monggis	7	0	7	25 – 64 years
Nalumad	17	2	19	18 – 69 years
Pinawantai	0	1	1	37 years
Takutan	17	6	23	19 – 56 years
Toruntungon	0	1	1	19 years
Ulu Kukut	5	1	6	16 – 69 years
TOTAL	116	51	167	16 – 80 years

Each workshop took two days of community-led discussions to complete. A number of people stated explicitly that no secret or sacred knowledge of medicinal plants would be divulged, and the consensus obtained was to focus on commonly used medicinal plants. For each plant, informants listed the Dusun name, life form, medicinal uses, and a description of how it is used. It should be noted that while all of the brainstorming sessions were conducted in Dusun, the final results were translated (by the informants themselves) and presented in Bahasa Malaysia. The sessions resulted in a list of 113 folk species of generic and specific rank, with a total of 212 individual medicinal applications (see Table 4.2.3). Although it was not specifically requested, informants also listed nine recipes of between three to twelve plant combinations, with a total of eleven individual medicinal applications. No data on the pharmacological properties of any of these species was collected, and their medicinal effectiveness remains an affirmation of local beliefs and experiences.

Table 4.2.3. Plant Manual: Overview of results

Number of folk taxa	113	Number of recipes	9
Number of medicinal uses	212	Number of medicinal uses	11

The results are grouped according to four clusters, each cluster comprising villages that participated in a workshop session (see Table 4.2.4). It is important to note three things. First, the entire exercise was directed towards community-controlled research, thus much of the decision-making was by villagers themselves. In other words, villagers decided which plants to include into the final publication as well as counterbalancing what kinds of treatments were to be described. Second, this was an exercise to collate plant knowledge rather than to assess variation. Villagers were interested in balancing out the different levels of plant knowledge between all the villages. So while some of the plants that made it to publication were mentioned by more than one cluster, villagers also prioritised plants that were not well known in some areas. In this way, they felt that plant knowledge would be disseminated and shared with other villages. Third, this was not an empirical exercise, but one centred on social negotiations between villagers so that consensus could be formed as to which kinds of plant knowledge would be shared.

There was therefore a reasonable degree of overlap in the listing of 113 taxa, whereby some taxa as well as their medicinal applications were mentioned more than once by different clusters. Conversely, there were also taxa that were mentioned by one cluster only, although I do not take this to mean that it is exclusive knowledge. It is interesting to note that even though the Kiau cluster (1) had the fewest number of informants (20%) of the total number of people consulted, they nonetheless managed to list the most number of folk taxa (30%). The Kiau cluster (1) also described 68 individual medicinal uses, which together with the Melangkap cluster (3), is the highest number of attributed uses described throughout the sessions (30%).

Table 4.2.4. Plant Manual: Taxa and uses according to village cluster

Village cluster	No. of informants	No. of taxa	No. of medicinal uses
1. Kiau Nuluh, Kiau Toburi, Kiau Tomodu	33 20%	47 30%	68 30%
2. Mantanau, Ulu Kukut	35 21%	31 20%	41 18%
3. Melangkap Baru, Melangkap Kapa, Melangkap Nariou, Melangkap Tiong, Melangkap Tomis	48 29%	42 27%	69 30%
4. Monggis, Nalumad, Pinawantai, Takutan, Toruntungon	51 30%	35 23%	50 22%
TOTAL	167	155	228

In terms of the 113 taxa listed, there was a representation of the main life forms of *kayu*, *wakau* and *sakot*, in addition to palms, ferns, and ant plants. However, because of the sheer numbers of taxa, difficulties in obtaining specimens during the El Niño drought, and because of difficulties in communicating between villages, it was decided that only a selection of taxa would be studied further. Based on this preliminary listing of 113 taxa, village representatives prioritised a list of forty medicinal plants for further data collection and to be published in the plant manual. Voucher specimens were collected from each of the twenty village areas to verify the scientific identification of the forty folk taxa, an exercise conducted by villagers themselves, taking up to six weeks in some areas. During this time, informants consulted with other community members to collect data on the uses of these plants. Interestingly, all informants managed to collect data for all the forty plants, even for taxa that were not mentioned by their cluster in the initial workshops. Although a few informants had difficulties in getting voucher specimens, but they nonetheless managed to collect information on plant uses by consulting with other people in their village. The results from each village were checked against the specimens and information from other villages and from the PEK database. Once the plant profiles were collated, these results were redistributed to informants for further verification.

As it turned out, the final list of forty taxa represented plants that could be found either directly in the village area or in swidden fields and young secondary forest (see Table 4.2.5). I do not take these forty plants as a definitive representation of Dusun plant knowledge, simply because they were chosen for a specific reason – publication – without any necessary bearing on contemporary trends in actually using these plants. The medicinal treatments listed represent a breadth of common ailments ranging from stomach pain, sore throats, boils, to more serious conditions such as malaria and jaundice (see also Ahmad, 2000; Guntavid, 1984). Informants admitted these medicinal treatments have become uncommon as more people turn towards modern medicine. An exception is post-natal treatment, which is still widely practiced and can involve recipes that combine up to twelve plants in a tonic. Even in cases where mothers have experienced a hospital delivery, it is common for them to consume this tonic upon their return home to the village. Ironically, it is often the men who are more familiar with this treatment (as well as knowing the distribution of the plants) as it is the husbands who have to prepare the tonic while their wives are recuperating.

Table 4.2.5. Plant Manual: Final forty list of plants published in the manual[3]

No	Dusun name	Species	Family	Used to treat
1	Baing	*Ocimum* sp.	Lamiaceae	Wounds in livestock
2	Binuang	*Octomeles sumatrana*	Datiscaceae	Stomach ache
3	Daing	*Piper* sp	Piperaceae	Nose bleed and itching
4	Dalai	*Coix lachrycma-jobi.*	Poaceae	Sore throat, colds, and fever
5	Gombirang	*Cassia alata*	Fabaceae	Skin irritation
6	Gosing	*Melastoma malabathricum*	Melastomataceae	Stomach ache, diarrhoea
7	Gunaton	*Poikilospermum* sp.	Urticaceae	Eye pain and insect bites
8	Kapur	*Dryobalanops lanceolata*	Dipterocarpaceae	Body ache and skin wounds
9	Kikiu	*Barringtonia* sp.	Barringtoniaceae	Diarrhoea, swelling and bone ache
10	Kiri-kiri	*Crotalaria pallida*	Fabaceae	Body heat
11	Kolopis	*Citrus* sp.	Rutaceae	Sore throat
12	Kosup	*Chloranthus* cf. *officinalis*	Chloranthaceae	Body ache
13	Lampada	*Ervatamia macrocarpa*	Apocynaceae	Boils
14	Langod-langod	*Equisetum* sp.	Equisetaceae	Sprains
15	Lintagu	*Rubus moluccanensis*	Rosaceae	Post natal recovery
16	Lintotobou	*Ficus septica*	Moraceae	Gastroenteritis and post natal recovery
17	Mandahasi	*Leucosyke capitellata*	Urticaceae	Post natal and mouth sores
18	Pagago	*Hydrocotyle asiatica*	Apiaceae	Diarrhoea
19	Paka	*Imperata cylindrica*	Poaceae	Teething pain in children
20	Pakutiou	*Angiopteris evecta*	Maratiaceae	Swelling and diarrhoea
21	Pampan	*Tetracera fagifolia*	Dilleniaceae	Eye pain
22	Pohou	*Musa* sp.	Musaceae	Scalding
23	Radap	*Erythrina* sp.	Fabaceae	Body heat, chicken pox, and skin irritation
24	Rumbio	*Metroxylon sagu*	Arecaceae	Faintness
25	Sawalikan	*Embelia dasythyrsa* .	Myrsinaceae	Mouth sores in children and eye pain
26	Solinatad	*Eleusine indica*	Poaceae	Coughing, colds, and asthma
27	Sorimpogun	*Passiflora foetida*	Passifloraceae	Jaundice
28	Soriondou	*Eurycoma longifolia*	Simaroubaceae	Malaria and high blood pressure
29	Soronipon	*Phyllanthus* sp.	Euphorbiaceae	Teething pain in children
30	Sri Kambang	*Gliricidie sepium*	Fabaceae	Mouth sores and food poisoning
31	Tali-tali	*Stachytarpheta jamaicensis*	Verbenaceae	Diarrhoea
32	Tapayas Kusai	*Carica papaya* .	Caricaceae	Malaria and gastroenteritis
33	Tawawo	*Blumea balsamifera*	Asteraceae	Body wind, body heat and diarrhoea
34	Tensisilou	*Fibraurea tinctoria*	Menispermaceae	Jaundice and gastroenteritis
35	Timbalung Lanut	*Scindapsus longistipitatus*	Araceae	Itching from ulat bulu
36	Topis	*Pedilanthus* sp.	Euphorbiaceae	Boils
37	Totol Bubut	*Turpinia nitida*	Staphyleaceae	Sprains
38	Tuhau	*Etlingera punicea*	Zingerberaceae	Body wind and body heat
39	Turadan	*Curcubita* sp.	Cucurbitaceae	Food poisoning
40	Wadan	*Dinochloa sublaevigata*	Poaceae	Mouth sores and colds

[3] This is a summary list – the full version contains information on synonyms, life form, variety of uses, parts used, and method of preparation, and is published in Dusun and Bahasa Malaysia (Agama and Juanih, 1998)

This is a difficult data set to analyse because the exercise was not conducted systematically under similar conditions, and I am certainly aware of social negotiations that primed particular people to prioritise specific plants. Also, because data gathering was conducted in workshop group discussions, it is difficult to trace the knowledge of a particular plant to a specific person or groups of persons. However, this data set is valuable nonetheless because it provides an overall indication of how Kiau compares with other Dusun communities. For example, despite the smallest number of informants, 32 (or 68%) of the taxa mentioned by the Kiau cluster were not mentioned by any other cluster. At the end of the process however, only 17 (or 36%) of the taxa mentioned by the Kiau cluster made it to the final forty list (see Figure 4.2.2).

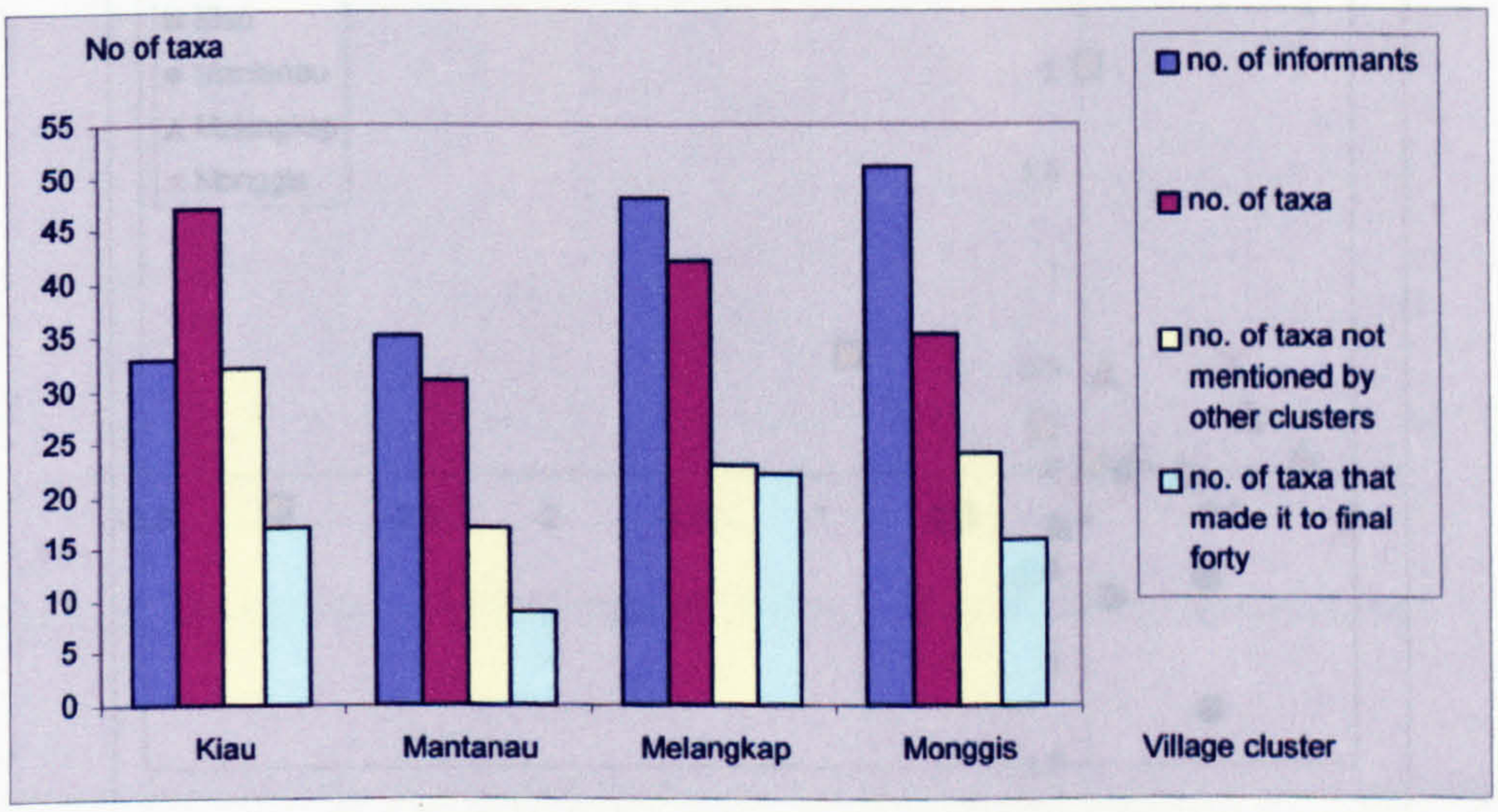

Figure 4.2.2. Plant Manual: Number of taxa mentioned according to village clusters

The Mantanau cluster comes out weaker, in that they mentioned the lowest number of total taxa, the lowest number of unique taxa (not mentioned by any other cluster), and the lowest number of taxa that actually made it to the final forty. Both Mantanau and Ulu Kukut are villages located along a main highway. The Kiau, Melangkap and Monggis clusters appear to be similar in overall trends, and I therefore invited them to participate in the subsequent Plant Trail exercise to further explore these trends under more controlled conditions.

Figure 4.2.3 shows the similarities between clusters[4]. The Melangkap and Monggis workshop groups form the core, in that there are stronger similarities between the taxa mentioned by these clusters (the various markers represent groups of workshop participants who presented each list). The Mantanau groups are closer to this core, although the one group that prioritised the

[4] Multi-dimensional scaling on Anthropac version 4.98

various uses of *piasau* (coconut) stands farther away from the core. The Kiau groups present a much wider picture of diversity compared to this core. Despite the overlap in the core, it is interesting to note that as the core diversifies, each village cluster diversifies in a separate direction. In other words, there is a high degree of unique taxa (taxa not mentioned by other groups) in each cluster. More interestingly, the Kiau groups present a much wider picture of diversity within the Kiau cluster itself, in that different Kiau groups were mentioning a much wider range of taxa compared to groups within the other clusters.

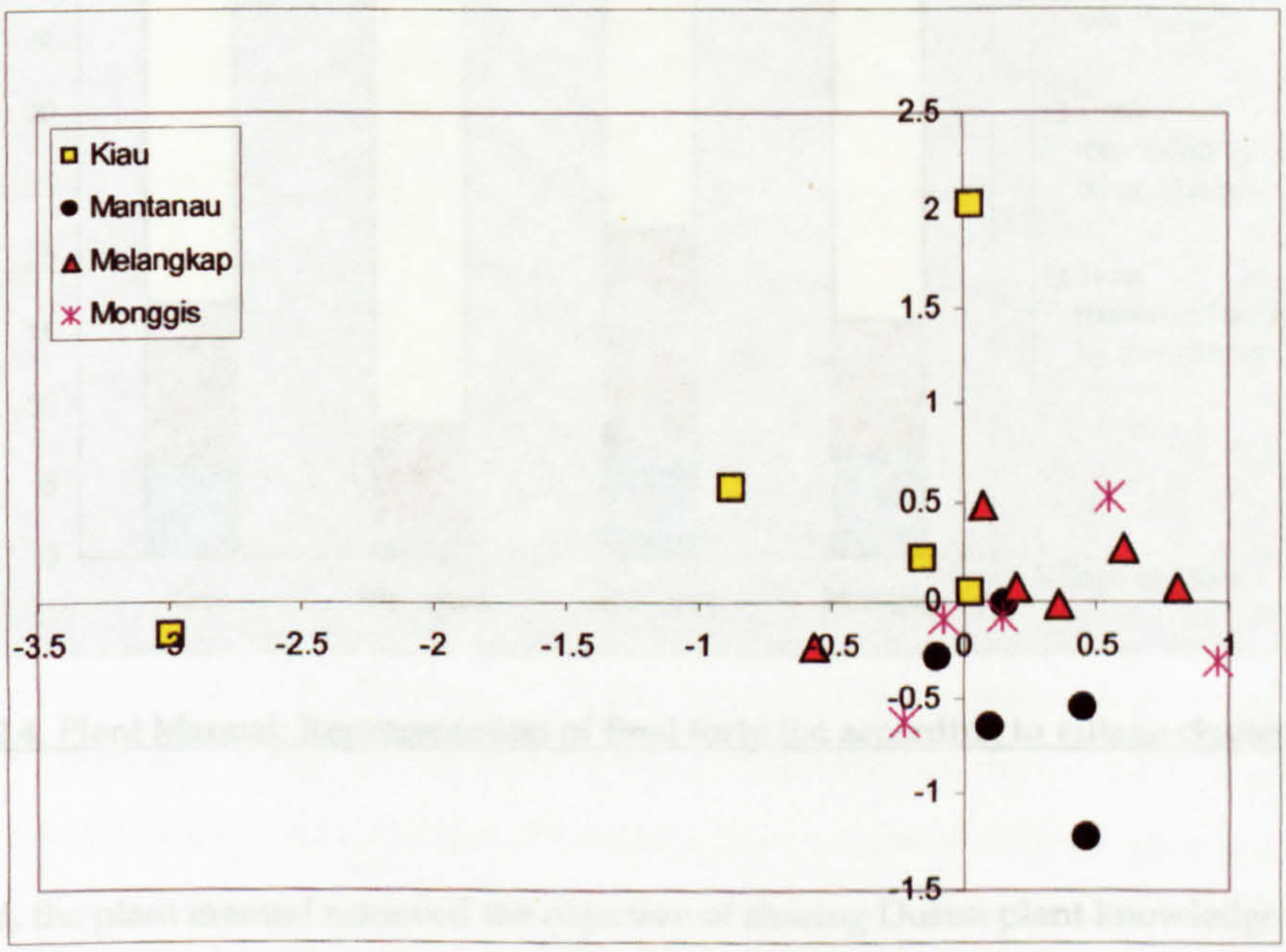

Figure 4.2.3. Plant Manual: Relationships between village clusters (in workshop groups) according to similarities in taxa mentioned.

An important concern raised by villagers was that unauthorised and uncontrolled use of this dataset in a way that violates their intellectual property rights. To protect their rights, villagers drafted a protocol document that established guidelines on the access and use of the plant manual and the data contained therein (see chapter two, section six, Box 2.6.2, also published in Laird, 2002). The data sets have been entrusted to the PEK and it was agreed that no further analysis would be carried out without the prior informed consent of all participating villages.

4.2.2.3. Conclusions

I use the plant manual dataset to roughly define the domain of further enquiry for the rest of this dissertation. For starters, this dataset has enabled me to select the villages where I would expand on my research, using Kiau as the main focal point. Furthermore, I treat the final forty list of medicinal taxa as a kind of draft free list, which has thus served to define the baseline of enquiry

in the Plant Trail survey. The final forty list, and to some extent the initial list of 113 taxa, I use as one reference point for preliminary cross-referencing against the results I obtain in the Plant Trail survey. And finally, this dataset has begun to sketch the main issue in the distribution of knowledge about medicinal plant names and uses – it is unevenly distributed – by tapping into a broad base of informants across social variables and geographical location.

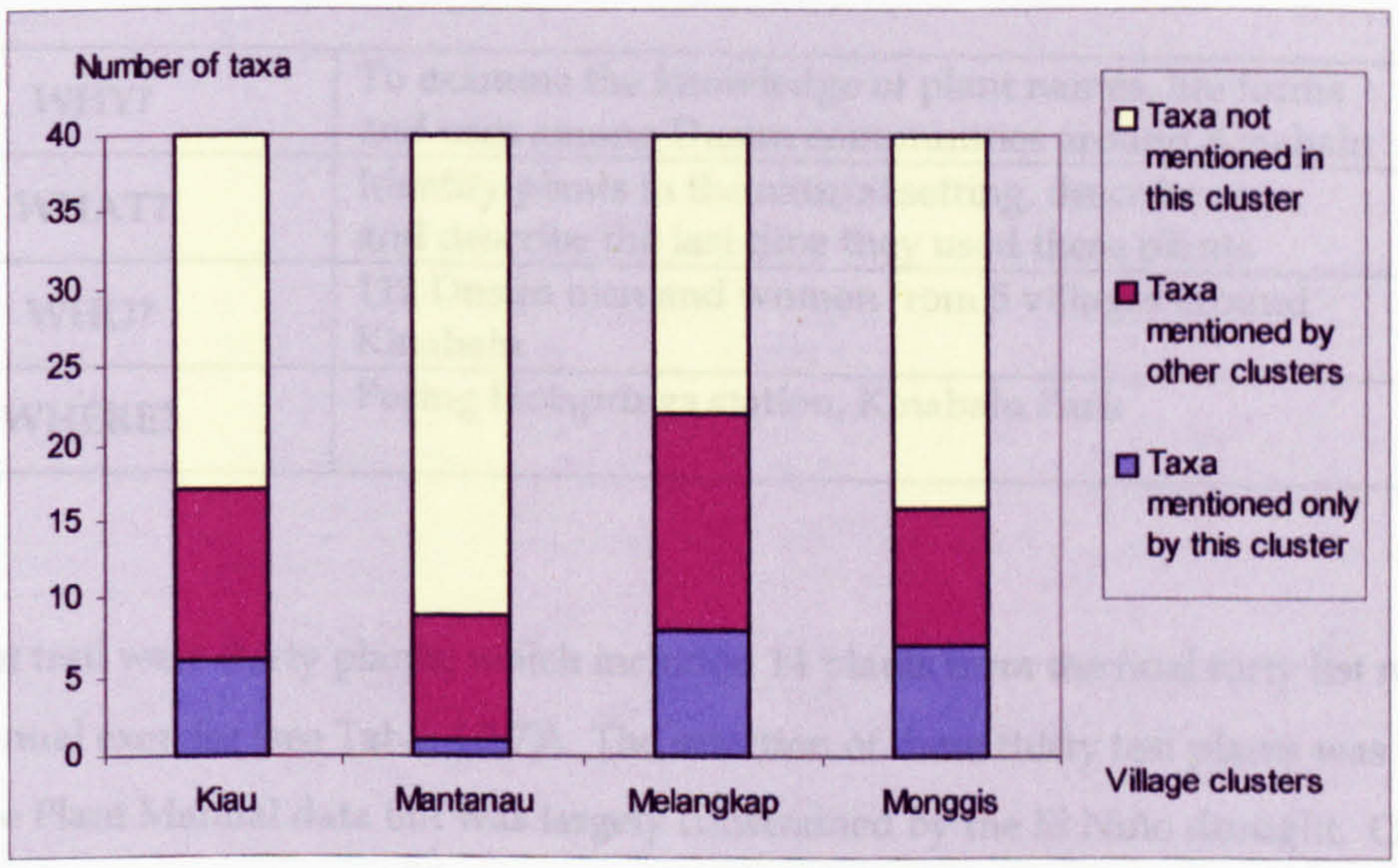

Figure 4.2.4. Plant Manual: Representation of final forty list according to village clusters

In the end, the plant manual achieved the objective of sharing Dusun plant knowledge across villages because the final forty plants represented a cross section of plants (see Figure 4.2.4). Thus someone in Kiau would read about a number of plants known in their village, as well as a good proportion of plants that is presumably not so well known in their area. In this same way, other village areas are sharing their plant knowledge with people in Mantanau, whose exposure to urbanisation may have reduced the salience of their indigenous plant knowledge. So, someone in Mantanau would recognise only a small number of plants in the manual, but they would be able to learn about a larger number of plants not well known in their area.

4.2.3. Part Two: Plant trail test

4.2.3.1. Synopsis

In April 1998 I invited the Kiau, Melangkap and Monggis clusters to participate in the Plant Trail exercise, which was held at the Poring Hotsprings Station of Kinabalu Park (see Figure 4.2.1). The purpose of this exercise is to examine people's knowledge about plant names, life forms and uses (see Table 4.2.6), so I tested informants to see if they could identify plants, describe the life

forms, describe the uses, and tell me about the last time they used these plants. With the help of the PEK, we prepared a nature walk where informants could stroll past designated plants in a natural setting and discuss, in casual conversation, the properties of these plants.

Table 4.2.6. Plant Trail: Synopsis

WHY?	To examine the knowledge of plant names, life forms and uses among Dusun communities around Kinabalu
WHAT?	Identify plants in the natural setting, describe uses, and describe the last time they used these plants
WHO?	112 Dusun men and women from 5 villages around Kinabalu
WHERE?	Poring Hotsprings station, Kinabalu Park

Along this plant trail were thirty plants, which included 14 plants from the final forty list named in the Plant Manual exercise (see Table 4.2.7)[5]. The selection of these thirty test plants was based primarily on the Plant Manual data but was largely constrained by the El Niño drought. Our efforts to transplant many plants to the test site failed because of the drought, and I was left to contend with only those that looked healthy enough to become the test thirty. Furthermore, despite our efforts to collect voucher specimens of each plant, we faced difficulties in getting fertile specimens. Even with some voucher specimens on loan from the Kinabalu Park Herbarium, we ended up with specimens for only 26 out of the thirty test plants. The test thirty plants were also checked for ecological representation, such that it provided an even representation of the flora of all village areas.

[5] Also Ahmad, (2000), Guntavid (1984), Lee & Gibot (1986)

Table 4.2.7. Plant Trail: Test thirty plants (numbered according to their position along the plant trail)

No	Dusun name	Species	Family	Voucher specimen
1	Rombisan	*Curculigo* sp.	Hypoxidaceae	Yes
2	Timbalung Lanut	*Scindapsus longistipitatus*	Araceae	Yes
3	Binuang	*Octomeles sumatrana*	Datiscaceae	Yes
4	Rongguol	*Alocacia macropiza*	Aracceae	Yes
5	Layo aragang	*Zingiber officinale*	Zingiberaceae	Yes
6	Kulung-kulung	*Centella asiatica*	Apiaceae	Yes
7	Tubo	*Hydrocotyle* sp.	Apiaceae	Yes
8	Lintagu	*Rubus moluccanus*	Rosaceae	Yes
9	Morogison	*Oldenlandisa corymbusa*	Rubiaceae	Yes
10	Rampah-rampah	*Eryngium foetidum*	Apiaceae	Yes
11	Torintid	*Salacca dolicholepis*	Araceae	No
12	Kosup	*Chloranthus* cf. *officinalis*	Chloranthus	Yes
13	Tindalat-dalat	*Strobilanthes sp.*	Acanthaceae	No
14	Kiri-kiri	*Crotalaria pallida*	Fabaceae	Yes
15	Tapayas Kusai	*Carica papaya*	Caricaceae	Yes
16	Gunaton	*Poikilospermum tangaum*	Urticaceae	Yes
17	Lias	*Donat caniformis*	Marantaceae	Yes
18	Soronipon	*Phyllanthus* sp.	Euphorbiaceae	Yes
19	Dokarok	*Schismatoglottis indef*	Araceae	Yes
20	Buntui	*Homalomena* sp.	Cyrtocladon	Yes
21	Pohuo	*Musa* sp.	Musaceae	Yes
22	Sogumau	*Alpina galanga*	Zingiberaceae	No
23	Gosing	*Melastoma malabathricum*	Melastomaceae	Yes
24	Dalai	*Coix-lachryma-jobi*	Poaceae	Yes
25	Tobu-tobu	*Costus speciosus*	Costusceae	Yes
26	Tali-tali	*Stachytarpheta jamaicensis*	Verbenaceae	Yes
27	Togiung	*Thysanolaena maxima*	Poaceae	Yes
28	Sampit-sampit	*Ficus deltoidea*	Moraceae	Yes
29	Rumun kilau	*Hydnophytum* sp.	Rubiaceae	No
30	Tonsisilou	*Fibraurea tinctoria*	Menispermaceae	Yes

4.2.3.2. Process

Testing alone took two weeks to complete, with 112 informants from the three village clusters (there were six villages in total that were clustered together according to proximity and shared access to forested areas) (see Table 4.2.8). Once again, participation was entirely voluntary and villages were free to decide who would participate. Informants' age ranged from six to seventy years, the youngest being Suil Maikol from Kiau Tomodu and the eldest being Ginsil Gindou also from Kiau Tomodu.

Table 4.2.8. Plant Trail: Informants who participated in the study

Village cluster	Males	Females	Total number	No. involved in plant manual exercise
1. Kiau Nuluh, Kiau Tomodu	20	17	37	9
2. Melangkap Tomis	20	15	35	10
3. Monggis, Pinawantai, Toruntungon	23	17	40	5
TOTAL	**63**	**49**	**112**	**24 (or 21%)**

There were 24 people who had been involved in the initial Plant Manual workshops, amounting to 21% of this current sample. Of the nine people from Kiau who were involved in the initial Plant Manual workshops, many of them and their families have continued to be key resources that have informed the development of this dissertation.

While this sample represents a reasonable distribution of men and women across ages, there are only very few people in the 20-29 year age group, with none at all from Melangkap (see Figure 4.2.5). I was told this was because most people in this age group were leaving the village in search for work or tertiary education. The sample represented a variety of occupations mostly as farmers but also including many who were formally employed in locations as far away as Peninsular Malaysia.

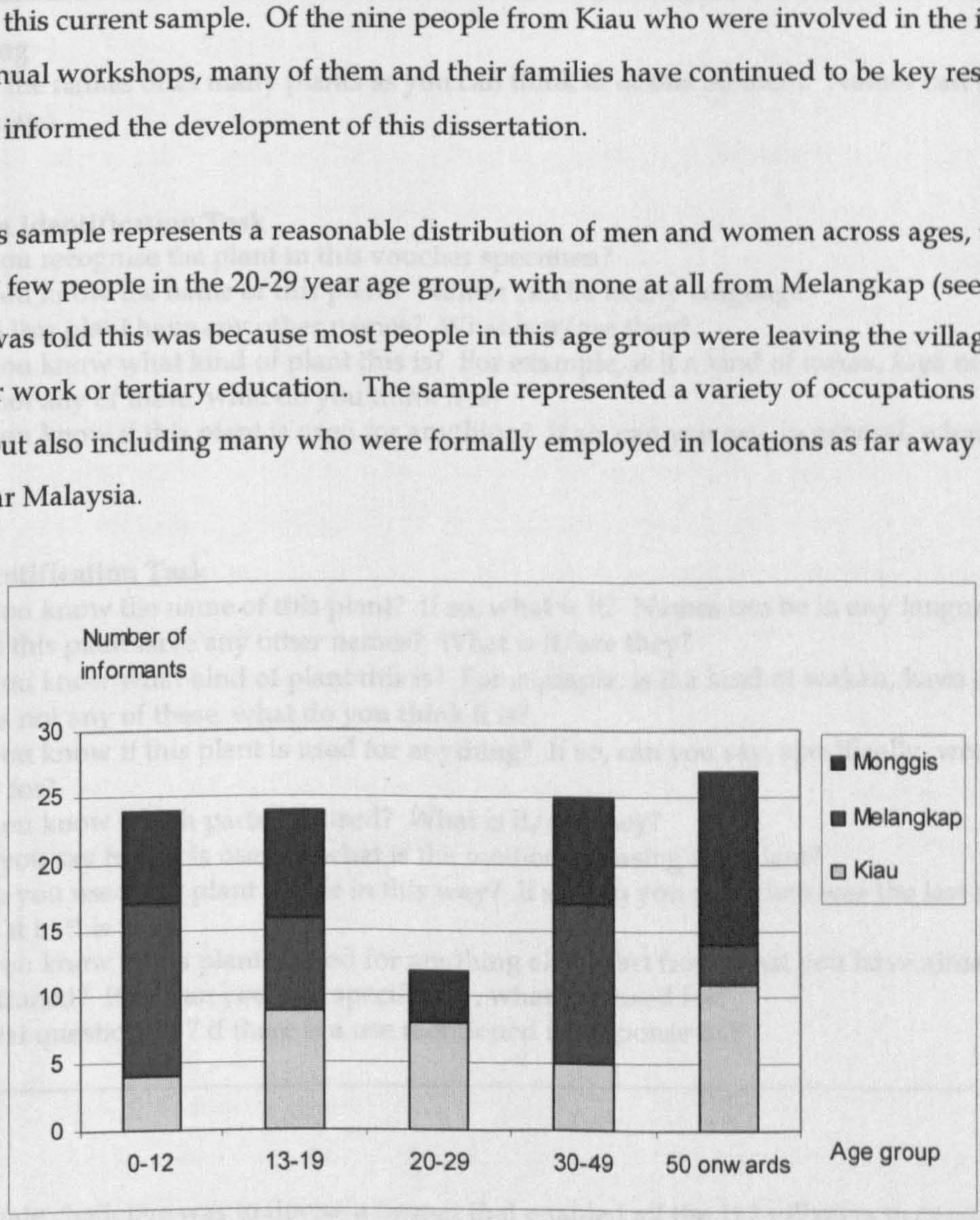

Figure 4.2.5. Plant Trail: Informants according to age groups

Testing involved three tasks: Free Listing, Specimen Identification, and Plant Identification. Each informant was tested on all three tasks. Each task was conducted in a different venue: the Free Listing task was outdoors (e.g. by a river, while walking, sitting on the grass); the Specimen Identification task was indoors; the Plant Identification task was outdoors along the designated nature walk. The research questions posed in each task are listed in Box 4.2.1. The Free Listing task was conducted like a semi-structured interview. The Specimen Identification and Plant Identification tasks were also semi-structured with a standardised sequence of questions based on the test thirty plants.

Box 4.2.1. Research questions asked to participants

Free listing

1. Give the names of as many plants as you can think of at this moment. Names can be in any language.

Specimen Identification Task

1. Do you recognise the plant in this voucher specimen?
2. Do you know the name of this plant? Names can be in any language.
3. Does this plant have any other names? What is it/are they?
4. Do you know what kind of plant this is? For example, is it a kind of *wakau*, *kayu* or *sakot*? If it is not any of these, what do you think it is?
5. Do you know if this plant is used for anything? If so, can you say, in general, what is it used for?

Plant Identification Task

1. Do you know the name of this plant? If so, what is it? Names can be in any language.
2. Does this plant have any other names? What is it/are they?
3. Do you know what kind of plant this is? For example, is it a kind of wakau, kayu or sakot? If it is not any of these, what do you think it is?
4. Do you know if this plant is used for anything? If so, can you say, specifically, what is it used for?
5. Do you know which parts are used? What is it/are they?
6. Can you say how it is used or what is the method for using this plant?
7. Have you used this plant before in this way? If so, can you say when was the last time you used it in this way?
8. Do you know if this plant is used for anything else apart from what you have already mentioned? If so, can you say, specifically, what is it used for?
9. Repeat questions 5-7 if there is a use mentioned in response to 8

The ultimate challenge was to devise a format that enabled all the 112 villagers to complete the three tasks within a two-week timeframe. The relentless drought meant that some of my test thirty plants were becoming dry and a little lifeless, and villagers were keen to go home quickly

to nurse their drought-ridden crops. The arrival of informants was staggered into six groups, whereupon each group would stay at the test site for two days before going home. I had the fortune of being assisted by a team of interviewers comprising seven Kinabalu Park botanical assistants (including three from PEK). All interviewers were Dusuns from various villages around Kinabalu and were therefore familiar faces to a number of the villagers in this survey. Interviewers were instructed to conduct all interviews in whichever language the informant was more comfortable with, and all of the informant's responses were to be recorded in the language it was delivered, irrespective of how correct the response seemed. Even though we maintained a reasonable pace, all of the interviewers were flexible on how much time was spent on each task. I recall one informant who spent over two hours talking his way through the plant identification task.

TASK ONE: FREE LISTING OF PLANTS

This was the first and most leisurely task, and informants would sit or stroll outdoors while conversing. Informants were asked to name as many plants as possible that freely came to mind. Informants were told they could name plants in any language, and did not have to stick to a single language (i.e. they could provide Dusun names for some plants and Bahasa Malaysia names for other plants – just whatever came to their minds first). For each plant listed, informants were asked to describe the life form, and if the informant used a non-Dusun plant name in the first instance, they were asked if they could additionally provide a Dusun name for the plant. The aim was to collect exhaustive free lists, so interviewers were prepared to spend as much time as possible on this task although we found that, on average, informants would complete this task in about twenty or thirty minutes. As a result, I find it difficult to determine whether the free lists really represent exhaustive lists or are perhaps, more representative of time limited lists. These lists nonetheless provide valuable insight into the Dusun plant vocabulary.

The main measure in this task is the names of taxa. The total number of taxa an informant has listed represents the plant vocabulary of this person. The plant vocabulary is measured in two ways. First, the size of the vocabulary – the number of taxa a person can name. Second, the diversity of the vocabulary – the different types of plants that a person can name, in comparison with other informants in the sample.

Free Listing: the size of the vocabulary

There were two informants who did not provide any data for the free listing task, which means there are only 110 informants in this data set[6]. Altogether, informants mentioned 602 unique

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[6] One informant is an elderly man who had some difficulty in comprehending the use value of verbally listing out plants. The other informant is a young girl who simply said that nothing in particular came to mind. Because information is

taxa at least once (see Table 4.2.9)[7]. Unique taxa means individual plant names irrespective of how many times they were mentioned, so even though *tapayas* was mentioned by twelve informants, it still counts as one unique taxa. The total number of unique taxa increases with the age of the sample, so Children (6-12 years) had a total of 137 taxa, Teenagers (13-19 years) had a total of 174 taxa, and Adults (20-70 years) had a total of 545 unique taxa.

Table 4.2.9. Free Listing Task: Free list according to age categories

Age category	No. of informants	No. of unique taxa	Ratio of informant to taxa	Average length of list (no of taxa)	Max-min length of list (no of taxa)
All (6 – 70)	110	602	1:5	26	45-3
Male	62	469	1:8		
Female	48	389	1:8		
Adults (20-70)	63	545	1:9	32	41-4
Male	38	427	1:11		
Female	25	336	1:13		
Teens (13-19)	23	174	1:7	20	45-6
Male	7	84	1:12		
Female	16	153	1:9		
Kids (6-12)	24	137	1:6	17	35-3
Male	17	123	1:7		
Female	7	54	1:8		
Under 19	47	225	1:5	19	45-3
Male	24	156	1:6		
Female	23	171	1:7		

The Adults (20-70 years) displayed the largest vocabulary of plant names, with a ratio of about nine unique taxa per informant. So on average, each person contributes about eight or nine unique taxa to the total vocabulary. Children (6-12 years) have a ratio of about six unique taxa per person, that is to say on average, each child contributes about five or six unique taxa to the total vocabulary of plant names for the age group. Teenagers (13-19 years) represent the middle ground between Adults and Children, with a ratio of seven unique taxa to each informant. Interestingly, when we combine Children with Teenagers, that is the Under 19 category (6-19 years), the ratio of informant to unique taxa drops. Each person Under 19 contributes only four or five unique taxa to the total vocabulary for the group. Crucially, both the Under 19 total number of taxa and the ratio of informant to taxa are about half the size of the Adults. Evidently, Teenagers are not contributing much more to the vocabulary than are Children. The disparity between Under 19s and Adults also brings about the question as to how possible it would be for these teenagers to accumulate a vocabulary twice their size throughout adulthood.

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voluntary, we did not seek to persuade these two informants to provide a response, and therefore they have been excluded from the free listing dataset.

[7] On Anthropac 4.0

The average length of an Adult free list is about 32 taxa while the average length of the Under 19 list is about 19 taxa. Analysis with t-tests revealed this difference is statistically significant ($t = 0.000000000000757$; $p < 0.01$) – as such, Adults can produce longer lists than Under 19s. In other words, the numbers of plants that can be recalled ranges from very few (4) to very many (41). Within the Under 19 category, the average length of a Teen list is about 20 taxa while the average length for Children is about 17 taxa. The difference between Adults and Teens is statistically significant ($t = 0.00000547$; $p < 0.01$), but there is no significant difference between Teens and Children ($t = 0.3896$; $p > 0.01$). In other words, Teens and Children exhibit similar abilities in the number of taxa they are able to list.

If however, we examine the range of list lengths, we find a surprising level of diversity. Adult lists can range from 4 to 41 taxa while Under 19 lists can range from 3 to 45 taxa. It appears as though Under 19s display as much diversity in the length of their lists as do Adults. In fact, the longest list is by Juliana (age 16, 45 taxa) from the Teen category, who listed more taxa than any one else in the entire sample[8]. There were also four Children who produced lists close to average length of an Adult list: Jack (age 10, 35 taxa), Kilvin (age 8, 33 taxa), Helmy (age 8, 30 taxa); and Jinuin (age 12, 27 taxa). So even though young people have about half the vocabulary of plant names than do adults, there is potentially a great deal of variation in how many plant names a young person can recall. This variation is illustrated in Figure 4.2.6 that shows the number of taxa mentioned according to age.

[8] I was the interviewer for Juliana and I remember never having enough paper to record all her responses

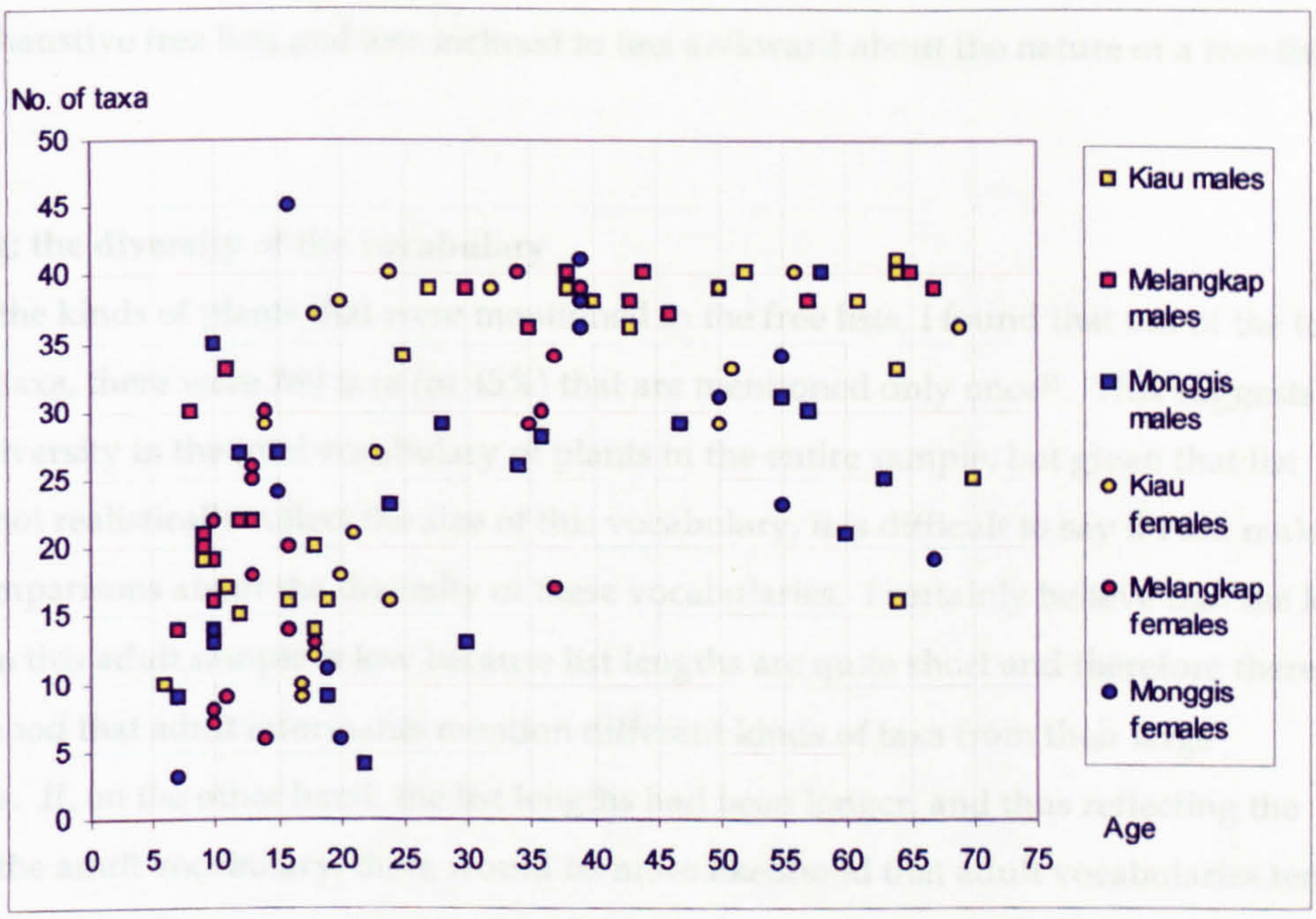

Figure 4.2.6. Free Listing Task: Number of taxa according to informant's age

Note that informants 19 years and under have the widest range in terms of number of taxa they can mention compared to informants aged between 20 years and over. The outliers in the 20 to 55 year group are informants who have been living away from the village, suggesting that absence from village life constrains their ability to recall plant names – putting these adult informants in the same range as young people. Outliers in the 55 to 70 years group are informants who tired out early on in the exercise.

An act of caution should be applied in interpreting these results. Analyses of the number of unique taxa reveal that an adult potentially has a vocabulary of at least 500 unique taxa[9]. This is a relatively vast vocabulary when we consider that the average adult list length found in this task is only about 32 unique taxa. I do suspect these comparatively short list lengths could have been constrained by the overall conveyor belt methodology of corralling informants from one task to another, and I certainly believe that free listing exercises conducted in a relaxed home environment and over longer periods of time would produce a more elaborate result[10]. I also feel that if informants are more involved in the overall research they would be more motivated to

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[9] This relates to discussions on Werner's Gray Haired Omniscient Speaker-hearer (Berlin, 1992), which involves a debate on whether plant knowledge as a whole comprises the *intersection* or the *union* of all individual or group plant knowledge. The position I am taking is an exploration of how the larger union of Kiau Dusun plant knowledge is fragmented into individual or group knowledge.

[10] We were unable to do this because informants came from so many different village settlements scattered around the park, and such a task would have provided very difficult to complete for this number of informants

produce exhaustive free lists and less inclined to feel awkward about the nature of a free listing exercise.

Free Listing: the diversity of the vocabulary

Looking at the kinds of plants that were mentioned in the free lists, I found that out of the total 602 unique taxa, there were 269 taxa (or 45%) that are mentioned only once[11]. This suggests a very high diversity in the total vocabulary of plants in the entire sample, but given that list lengths do not realistically reflect the size of this vocabulary, it is difficult to say if I am making accurate comparisons about the diversity of these vocabularies. I certainly believe that the level of overlap in this adult sample is low because list lengths are quite short and therefore there is more likelihood that adult informants mention different kinds of taxa from their large vocabularies. If, on the other hand, the list lengths had been longer, and thus reflecting the vastness to the adult vocabulary, there would be more likelihood that adult vocabularies tend of overlap more often. The twenty most frequently mentioned plants are listed in Table 4.2.10, and taken as a representation of the most salient plants in the sample's vocabulary.

[11] Although extensive effort was invested in checking plant names for multilingual synonyms against the PEK database and with some interviews with informants, I do not discount the possibility that there are undetected synonyms still in this dataset (especially plant names from the "Classical Dusun" spoken by older informants).

Table 4.2.10. Free Listing Task: Twenty most frequently mentioned plants

No.	Adults (20-70 years)		Teens (13-19 years)		Children (6-12 years)		Under 19 (6-19 years)	
	Name	Freq.	Name	Freq.	Name	Freq.	Name	Freq.
1	KOBU	34	TALIDUS	14	MAMPALAM	18	LANSAT	27
2	LITAK	31	LANSAT	12	BAYABAS	15	BAYABAS	26
3	MANDAHASI	23	TIMADANG	11	PUNTI	15	LUGUS	25
4	LAMBA	23	BAYABAS	11	LANSAT	15	PUNTI	25
5	POLOD	23	LUGUS	11	RANGALAU	15	MAMPALAM	25
6	TALIDUS	23	GOSING	10	LUGUS	14	TIMADANG	24
7	LINTOTOBOU	22	PUNTI	10	TIMADANG	13	RANGALAU	21
8	TAPAKOH	22	KOBU	10	NANGKO	12	NANGKO	20
9	PAKUDITA	21	PORING	9	TAPAYAS	11	TALIDUS	19
10	TIMADANG	21	NANGKO	8	PIASAU	10	TAPAYAS	18
11	TINTAP	21	MALAYSIA	7	PAKILAHAN	10	PORING	15
12	PORING	21	MAMPALAM	7	SUKANG	10	KOBU	14
13	SOLINATAD	20	KIRI-KIRI	7	KOLOPIS	8	PIASAU	14
14	LIAS	20	TAPAYAS	7	NANAS	7	GOSING	13
15	KIRI-KIRI	19	TINTAP	6	MALAYSIA	6	MALAYSIA	13
16	GOSING	18	DOKARUK	6	PORING	6	SUKANG	13
17	PAHU	17	LAMBA	6	PAHU	6	DOKARUK	12
18	TOGOP	17	DAING	6	BUNGA RAYA	6	BUNGA RAYA	12
19	PAKU PAKIS	16	BUNGA RAYA	6	BUNDU	6	KOLOPIS	12
20	POHUO	16	RANGALAU	6	DOKARUK	6	PAKILAHAN	12

Adults mentioned a variety of plants ranging from medicinal, construction and food plants. Children on the other hand, mentioned mainly fruits (the first thirteen plants are all fruits except for *lugus* (no. 6), which is betel nut). Teens exhibit a mix of fruits, medicinal, construction, and other use plants (e.g. *lamba*, which is used for rope; *daing*, which is used for the smoking kit). When we combine the lists for Teens and Children in the Under 19 category, fruits dominate the top twenty.

In terms of overlap, there are two plants (highlighted in yellow) that are mentioned by all Adults, Teens and Children in the top twenty: a fruit (*timadang*), and bamboo (*poring*) (see Table 4.2.11).

Table 4.2.11. Free Listing Task: Overlap in plants mentioned by different age groups

No.	Adults (20-70 years)		Teens (13-19 years)		Children (6-12 years)	
	Name	Freq.	Name	Freq.	Name	Freq.
1	GOSING	18	BAYABAS	11	BAYABAS	15
2	KIRI-KIRI	19	BUNGA RAYA	6	BUNDU	6
3	KOBU	34	DAING	6	BUNGA RAYA	6
4	LAMBA	23	DOKARUK	6	DOKARUK	6
5	LIAS	20	GOSING	10	KOLOPIS	8
6	LINTOTOBOU	22	KIRI-KIRI	7	LANSAT	15
7	LITAK	31	KOBU	10	LUGUS	14
8	MANDAHASI	23	LAMBA	6	MALAYSIA	6
9	PAHU	17	LANSAT	12	MAMPALAM	18
10	PAKU PAKIS	16	LUGUS	11	NANAS	7
11	PAKUDITA	21	MALAYSIA	7	NANGKO	12
12	POHUO	16	MAMPALAM	7	PAHU	6
13	POLOD	23	NANGKO	8	PAKILAHAN	10
14	PORING	21	PORING	9	PIASAU	10
15	SOLINATAD	20	PUNTI	10	PORING	6
16	TALIDUS	23	RANGALAU	6	PUNTI	15
17	TAPAKOH	22	TALIDUS	14	RANGALAU	15
18	TIMADANG	21	TAPAYAS	7	SUKANG	10
19	TINTAP	21	TIMADANG	11	TAPAYAS	11
20	TOGOP	17	TINTAP	6	TIMADANG	13

There are six plants (highlighted in blue) mentioned by Adults that are also mentioned by Teens, all of which have uses other than food. There are ten plants (highlighted in red) mentioned by Children that are also mentioned by Teens, seven of which are fruits, betel nut (*lugus*), and a vegetable (*dokaruk*). Interestingly, the remaining two taxa mentioned by both Children and Teens are the only ones in the top twenty list that do not have Dusun names, and furthermore, both are connected to national unity symbols (*bunga raya* is the national flower, and *Malaysia* (also known as *rumput Malaysia*) is a kind of grass found in the village area and in swidden fields.

As Table 4.2.11 shows, the top twenty plants mentioned by Teens represents a mix of what Adults and Children are mentioning. *Daing* is the only plant in the Teen top twenty not mentioned in the top twenty of either Adults or Children. *Daing* is commonly used for the smoking kit and has some medicinal uses: it is mentioned five times in the Adult list (no. 106 out of 545 taxa) and is mentioned four times in the Children's list (no. 34 out of 137 taxa). Another interesting exception is *pahu*, which is a fruit, and is mentioned in both the Adult and Children top twenty, but not in the Teen top twenty. As a matter of fact, *pahu* is only mentioned once (no.

135 out of 174 taxa) in the Teen list: by Raxelin (age 13) from Melangkap Tomis. In the Children list, *pahu* was mentioned by four children from Melangkap Tomis and two from Monggis.

There is one crucial feature to note at this stage: the Children list (137 taxa in total) also includes *epal* (apple), *anggur* (grapes), *bayam* (spinach) *kailan* (Chinese broccoli), and *kelapa sawit* (oil palm), all of which were mentioned once. All of these plants are extremely uncommon in Dusun villages around Kinabalu, and these are Bahasa Malaysia plant names, except for *kailan*, which is the Romanised version of the original Chinese name. Furthermore many of the fruits in the Children's top twenty list were initially listed by many children using the Bahasa Malaysia names instead of the Dusun names (e.g. *rambutan* (Bahasa Malaysia) instead of *rangalau* (Dusun); *pisang* (Bahasa Malaysia) instead of *punti* (Dusun))[12].

A consensus analysis reveals a very high consensus between all 110 informants (reliability factor: 0.998; eigenvector ratio: 97:1)[13]. Certainly, Figure 4.2.7 displays a strong degree of overlap in the kinds of taxa mentioned by all informants, irrespective of village. Both men and women display a wide distribution, with no obvious clustering according to gender. The core of this distribution is comprised of mainly Under 19s. It is easy to see how younger people display the most similarities, but as people grow older, their vocabulary of plants becomes more diverse. Informants forming the outer most rim of the consensus are people aged 30 years and over. The exception is Juliana (circled), who at age 16, is perhaps the most different informant of the group (she was also the one who produced the longest list).

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[12] For statistical analysis, I have standardised all plant names according to Dusun terms, unless there are plants that do not have known Dusun names (e.g. epal, rumput Malaysia). I have also kept records of responses in the language actually used by the informant, whether Dusun or Bahasa Malaysia, which I refer to in cross-referencing analyses such as this.

[13] On Anthropac version 4.98

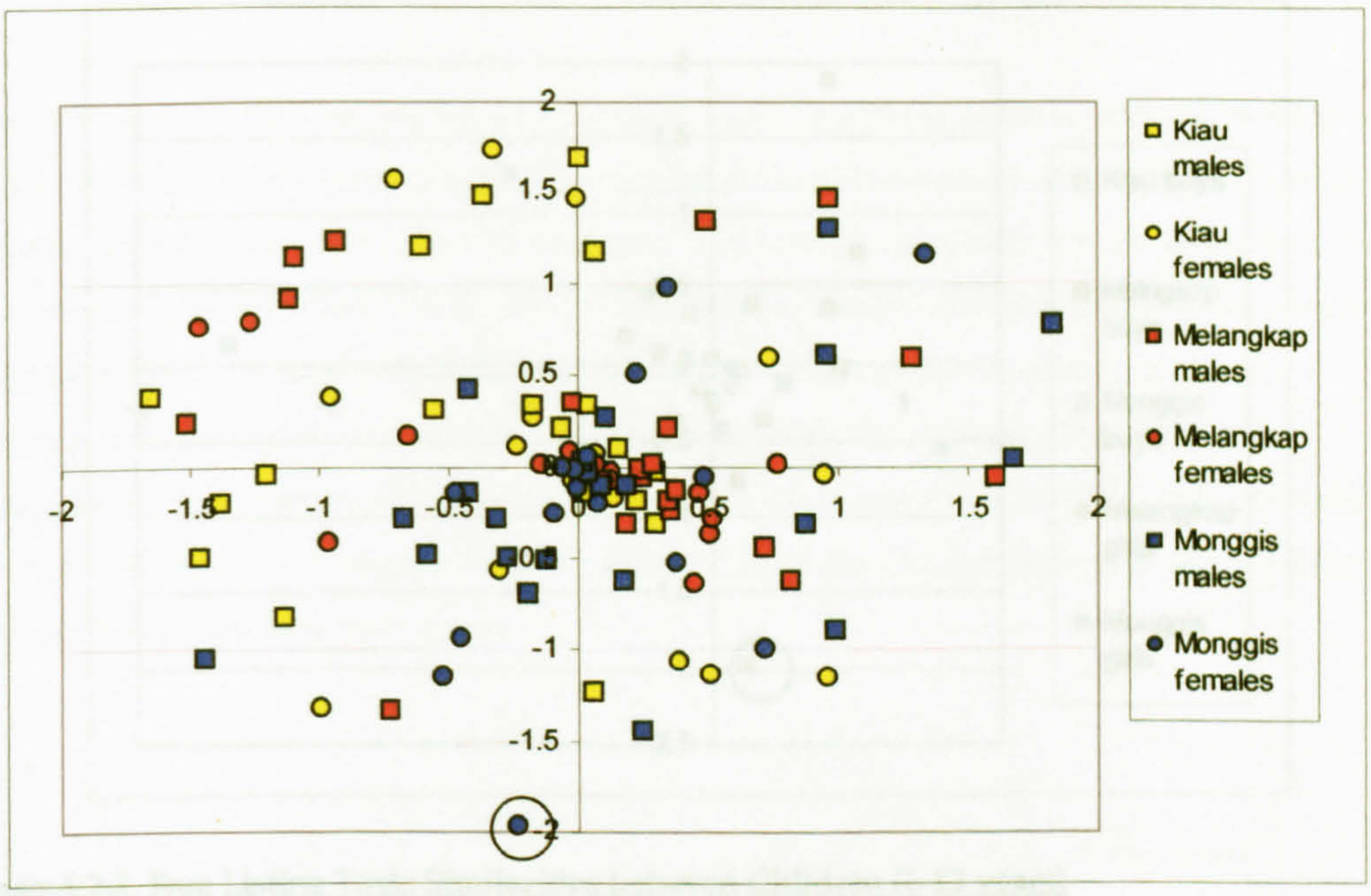

Figure 4.2.7. Free Listing Task: Similarities between informants

Another feature of the distribution pattern is that knowledge diversifies in different directions, such that there is a wide range of taxa known by different people. Thus as people grow older, different people possess a much wider vocabulary of different kinds of plants. This is supported by the high incidence (45%) of taxa that were only mentioned once. In other words, almost half the taxa mentioned by all informants were taxa mentioned only once.

Free Listing: the age effect

A similar distribution pattern is found when we look at Children only (see Figure 4.2.8). Despite being a much smaller sample (24 informants), the consensus is very strong (reliability: 0.978; eigen ratio: 29:1). The core is formed mainly by the younger informants (6-10 years), and the outer rim is comprised of older children (10-12 years). The exception is Helmy (circled), aged 8, whose plant vocabulary is different from other boys from his village. Helmy is the son of Lorin Lugas. Lorin is the most prolific PEK collector, having collected over 3,000 voucher specimens of plants (Beaman, 2002; pers. comm.). The other three boys in the outermost rim are Jack and Jinuin from Monggis, and Kilvin from Melangkap. All these four boys were the ones who produced lists that were close to the average length of adult lists – they have a plant vocabulary that is as wide as the average adult vocabulary. Additionally, note that the distribution diversifies in different directions – so different children know about different kinds of plants.

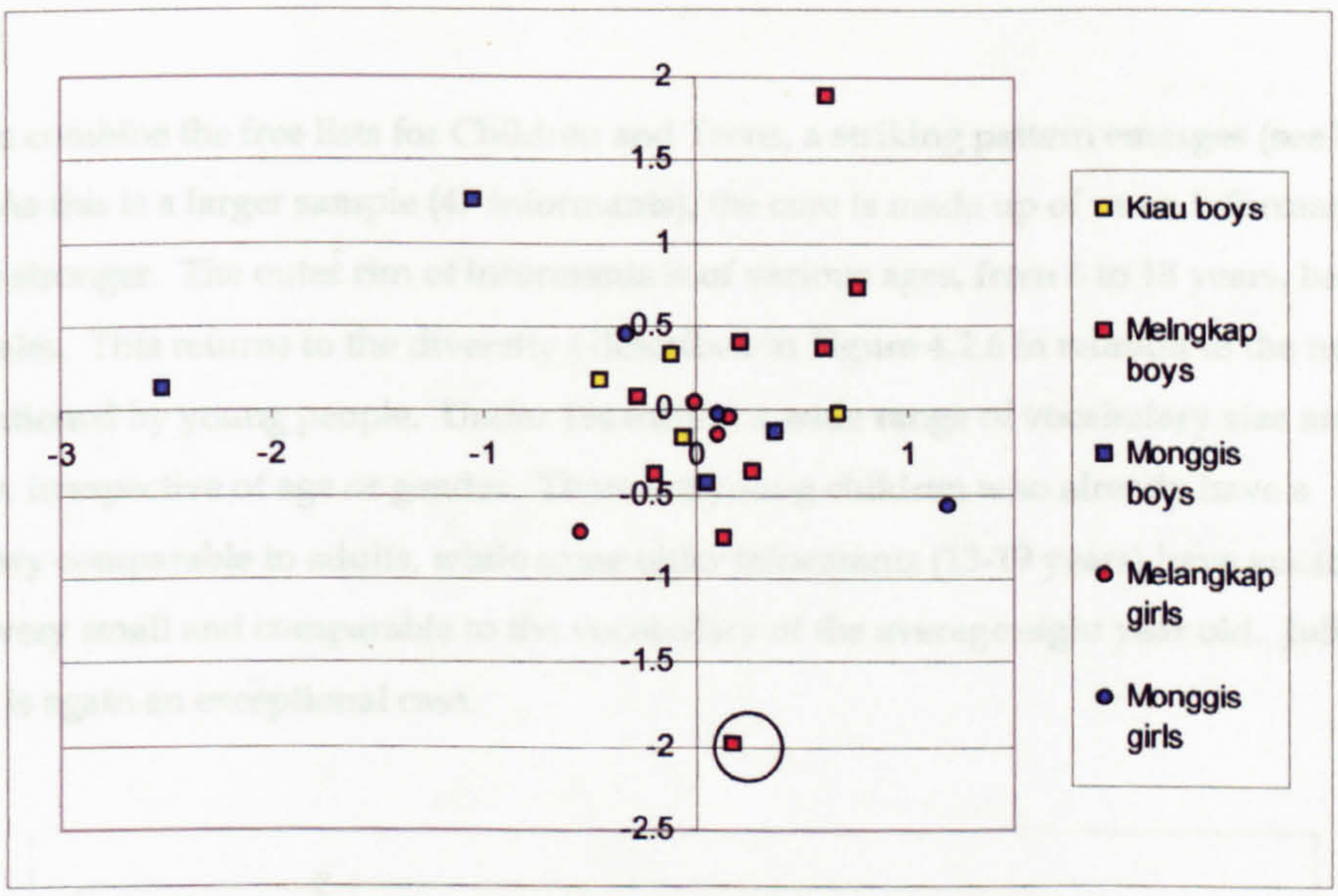

Figure 4.2.8. Free Listing Task: Similarities between Children (6-12 years)

The Teen sample is also small (23 informants), but the consensus ratings are also very strong (reliability: 0.975; eigen ratio: 27:1). Again, Figure 4.2.9 shows a core of informants that gradually diversify in different directions. Juliana (circled) again, stands alone. Juliana, aged 16, is the daughter of Matamin Rumutom. Matamin is the PEK collector for Monggis. He stopped Juliana's schooling at age 14, so she spends her time in the village assisting her father with the PEK collections.

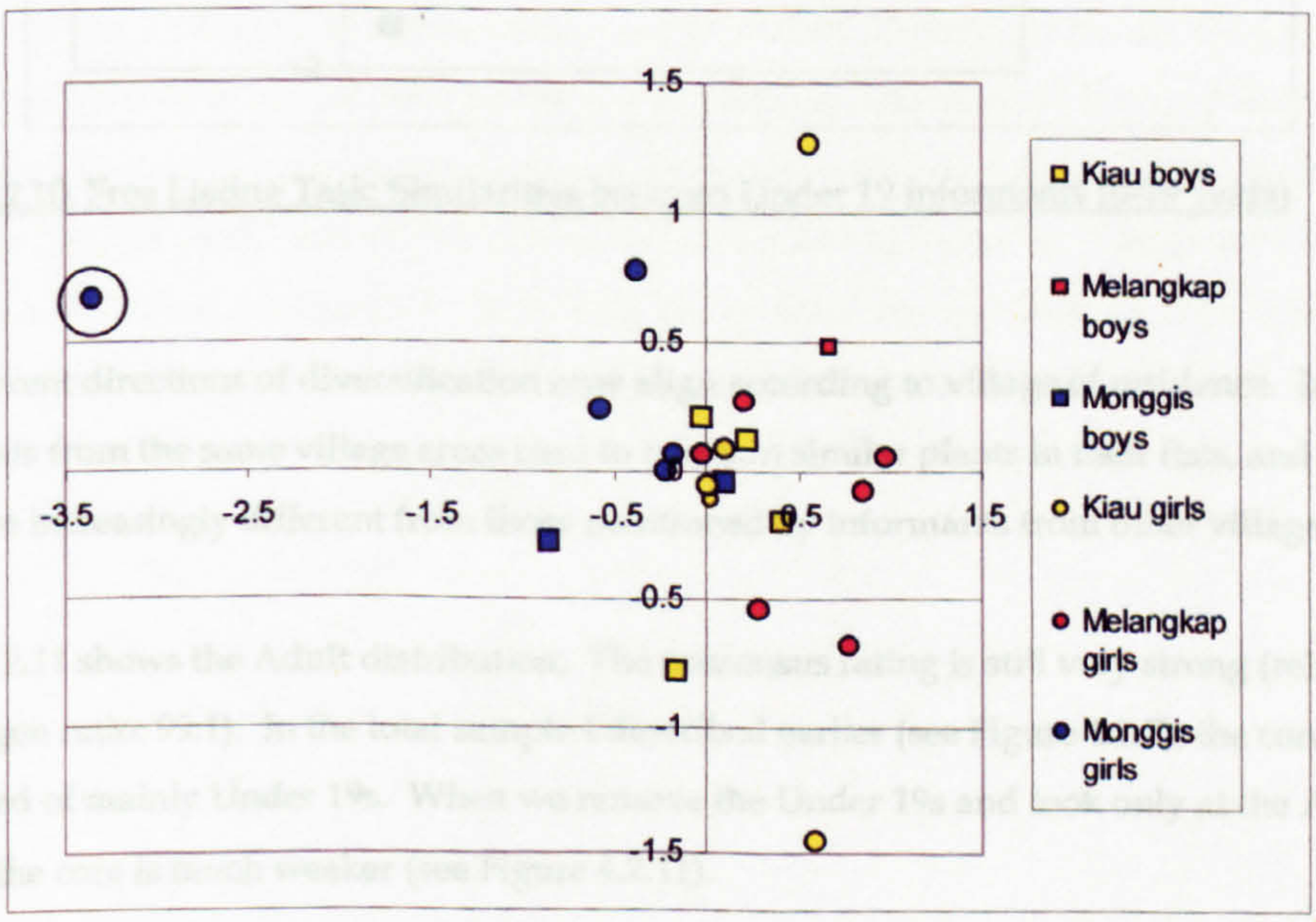

Figure 4.2.9. Free Listing Task: Similarities between Teenagers (13-19 years)

When we combine the free lists for Children and Teens, a striking pattern emerges (see Figure 4.2.10). As this is a larger sample (47 informants), the core is made up of more informants and becomes stronger. The outer rim of informants is of various ages, from 8 to 18 years, both males and females. This returns to the diversity I described in Figure 4.2.6 in relation to the number of taxa mentioned by young people. Under 19s exhibit a wide range of vocabulary size and diversity, irrespective of age or gender. There are young children who already have a vocabulary comparable to adults, while some older informants (13-19 years) have vocabularies that are very small and comparable to the vocabulary of the average eight year old. Juliana (circled) is again an exceptional case.

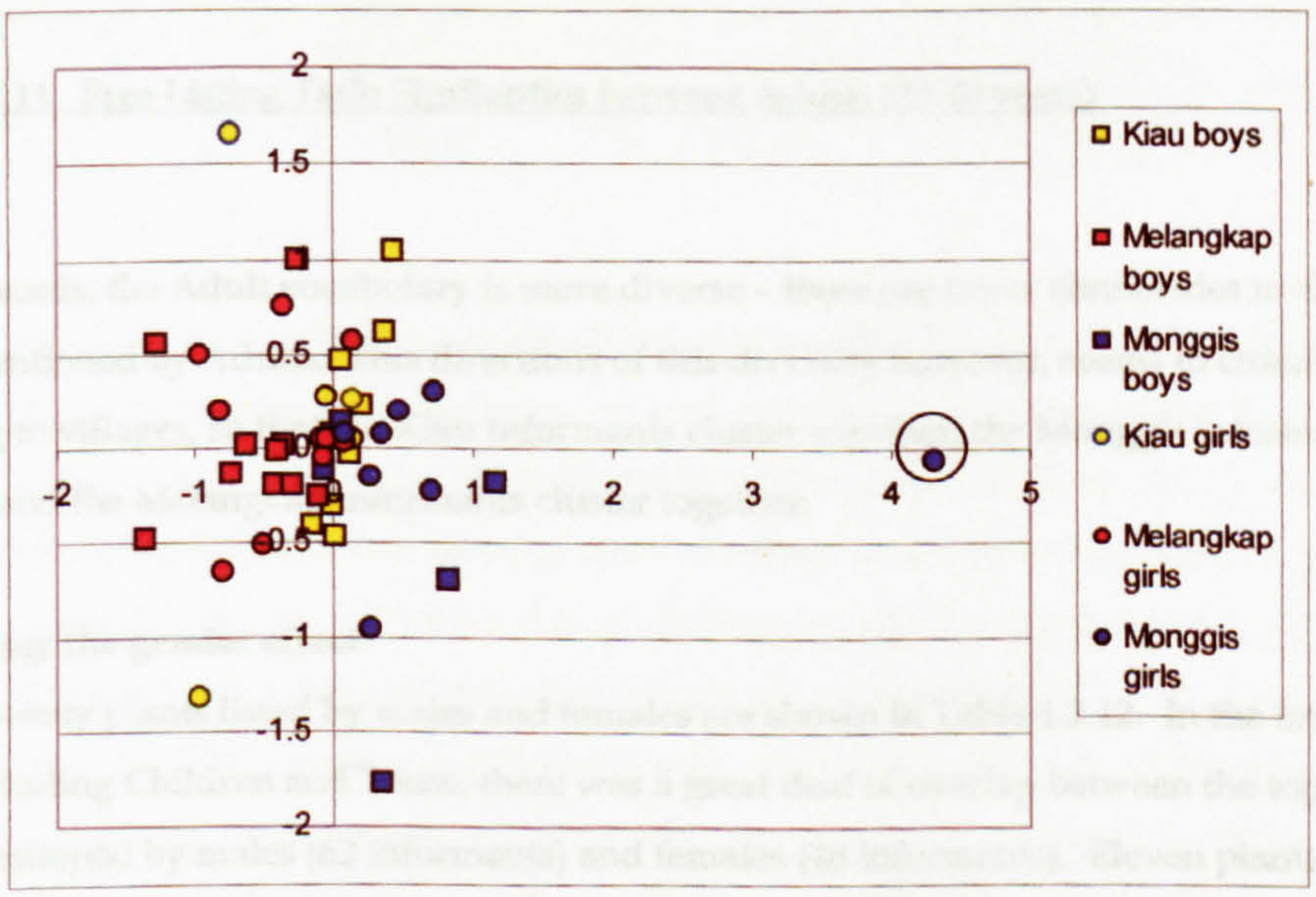

Figure 4.2.10. Free Listing Task: Similarities between Under 19 informants (6-19 years)

The different directions of diversification now align according to village of residence. In short, informants from the same village areas tend to mention similar plants in their lists, and these plants are increasingly different from those mentioned by informants from other villages.

Figure 4.2.11 shows the Adult distribution. The consensus rating is still very strong (reliability: 0.996; eigen ratio: 99:1). In the total sample I described earlier (see Figure 4.2.7), the core is comprised of mainly Under 19s. When we remove the Under 19s and look only at the Adults, we find the core is much weaker (see Figure 4.2.11).

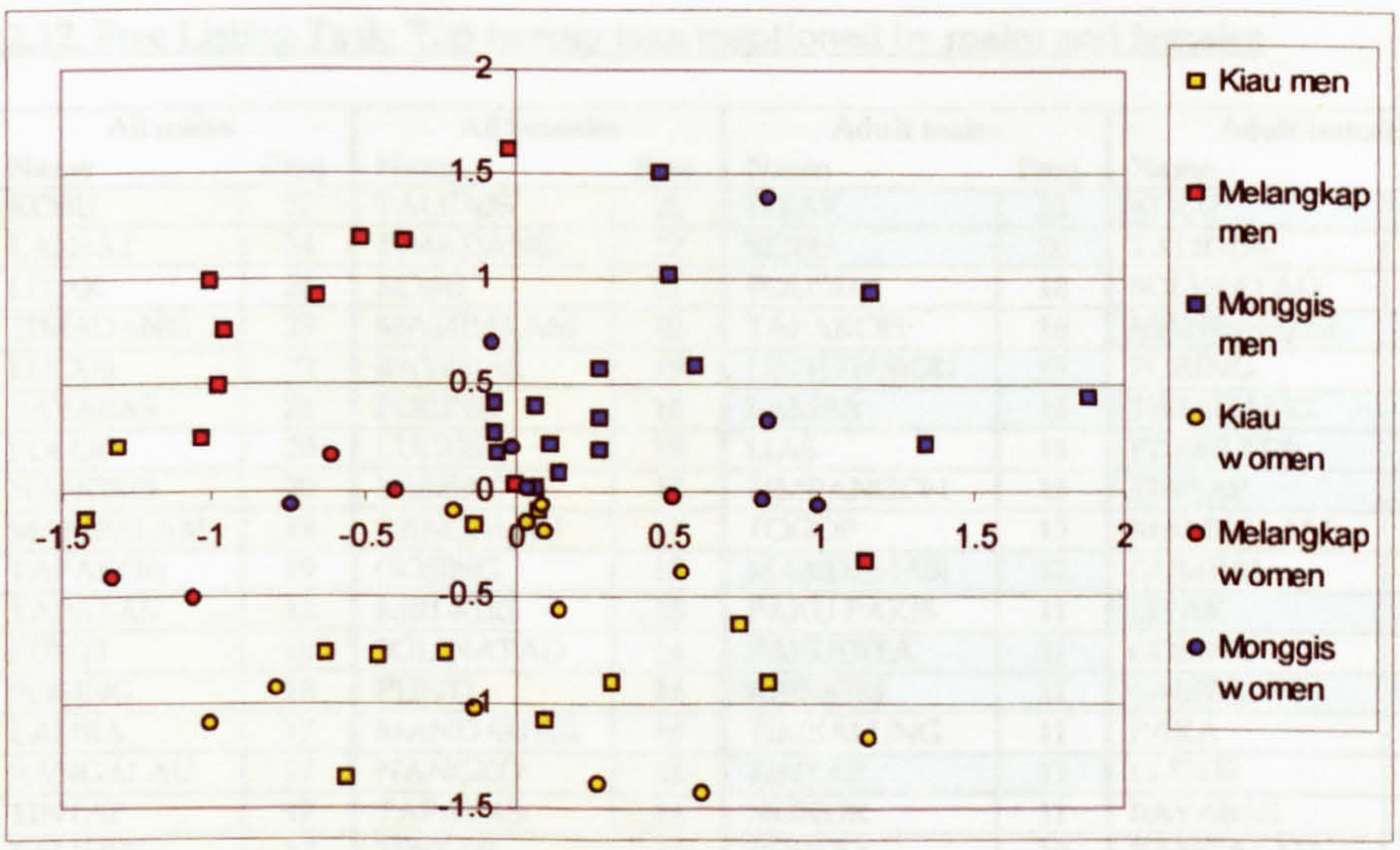

Figure 4.2.11. Free Listing Task: Similarities between Adults (20-70 years)

In other words, the Adult vocabulary is more diverse – there are fewer similarities in the plant names mentioned by Adults. This directions of this diversity however, seems to cluster according to villages, so that the Kiau informants cluster together, the Monggis informant cluster together, and the Melangkap informants cluster together.

Free Listing: the gender effect

The top twenty plants listed by males and females are shown in Table 4.2.12. In the total sample, that is including Children and Teens, there was a great deal of overlap between the top twenty plants mentioned by males (62 informants) and females (48 informants). Eleven plants (highlighted in yellow) out of twenty were mentioned by both males and females, of which nine plants are used for food. This degree of overlap can be seen in Figure 4.2.7 that shows the similarities within the total sample. There does not appear to be any obvious differentiation between men and women, as reflected in the lack of distinct clusters.

Table 4.2.12. Free Listing Task: Top twenty taxa mentioned by males and females

No.	All males		All Females		Adult males		Adult females	
	Name	Freq.	Name	Freq.	Name	Freq.	Name	Freq.
1	KOBU	27	TALIDUS	25	LITAK	22	KOBU	14
2	LANSAT	24	TIMADANG	22	KOBU	20	TALIDUS	13
3	LITAK	24	KOBU	21	POLOD	18	SOLINATAD	12
4	TIMADANG	23	MAMPALAM	20	TAPAKOH	16	MANDAHASI	11
5	LUGUS	22	BAYABAS	19	LINTOTOBOU	15	PORING	11
6	BAYABAS	21	PORING	18	LAMBA	14	TIMADANG	11
7	POLOD	20	LUGUS	18	LIAS	13	PAKUDITA	10
8	NANGKO	20	LANSAT	18	TIMPANGOH	13	TINTAP	10
9	MAMPALAM	19	RANGALAU	17	TOGOP	13	MAMPALAM	10
10	TAPAKOH	19	GOSING	17	MANDAHASI	12	GUMPAI	9
11	TAPAYAS	18	KIRI-KIRI	15	PAKU PAKIS	11	LITAK	9
12	PUNTI	18	SOLINATAD	14	PAKUDITA	11	GOSING	9
13	PORING	18	PUNTI	14	KIRI-KIRI	11	LAMBA	9
14	LAMBA	17	MANDAHASI	14	TIMBALUNG	11	PAKA	9
15	RANGALAU	17	NANGKO	14	TINTAP	11	LUGUS	8
16	TINTAP	17	TAPAYAS	14	NUNUK	11	BAYABAS	8
17	TALIDUS	17	TINTAP	13	POHUO	10	RANGALAU	8
18	DOKARUK	16	LAMBA	13	TIMADANG	10	KIRI-KIRI	8
19	LINTOTOBOU	16	PAKA	12	PAHU	10	LINTOTOBOU	7
20	TOGOP	16	PAKUDITA	11	PANGI	10	LOMU-LOMU	7

However, when we look at the top twenty plants mentioned in the Adult sample (20-70 years) only, there is a small decrease in the degree of overlap from eleven to nine plants (highlighted in green). This is still a strong overlap between males and females, and Figure 4.2.11 shows that similarities between informants is more an effect of village area than it is an effect of gender. The ratio of informant to number of unique taxa is relatively similar for Adult males (1:11) and Adult females (1:13) (see Table 4.2.9). In terms of the types of taxa, note that 50% of the total number of taxa mentioned by Adult males and 57% of the total taxa mentioned by Adult females were mentioned only once. This suggests a potentially high degree of diversity in the types of taxa known by different adults, but because the free lists are not exhaustive it is difficult to say if this finding really reflects the true level of overlap. Compared to the top twenty plants of all males in the total sample, Adult males mentioned fewer fruits (*timadang* and *pohuo*) in their top twenty. Instead, Adult males mentioned plants that represent a mix of uses, with more emphasis on trees (*polod, timpangoh, togop, nunuk, pangi*). Again, we can see it is the younger males (6-19 years) who are mentioning fruits, while older men have a more diverse vocabulary. Similarly, adult females display a more diverse vocabulary compared to younger females (6-19 years). Compared to adult males, adult females place more emphasis on food plants (*talidus, poring, timadang, mampalam, gumpai, lugus, bayabas, rangalau, lomu-lomu*).

Free Listing: the village effect

Differences in the types of taxa mentioned can be seen in the Melangkap sample (35 informants). Figure 4.2.12 shows that the core of the cluster is made up of young people, while the outer rim is made up of adult informants.

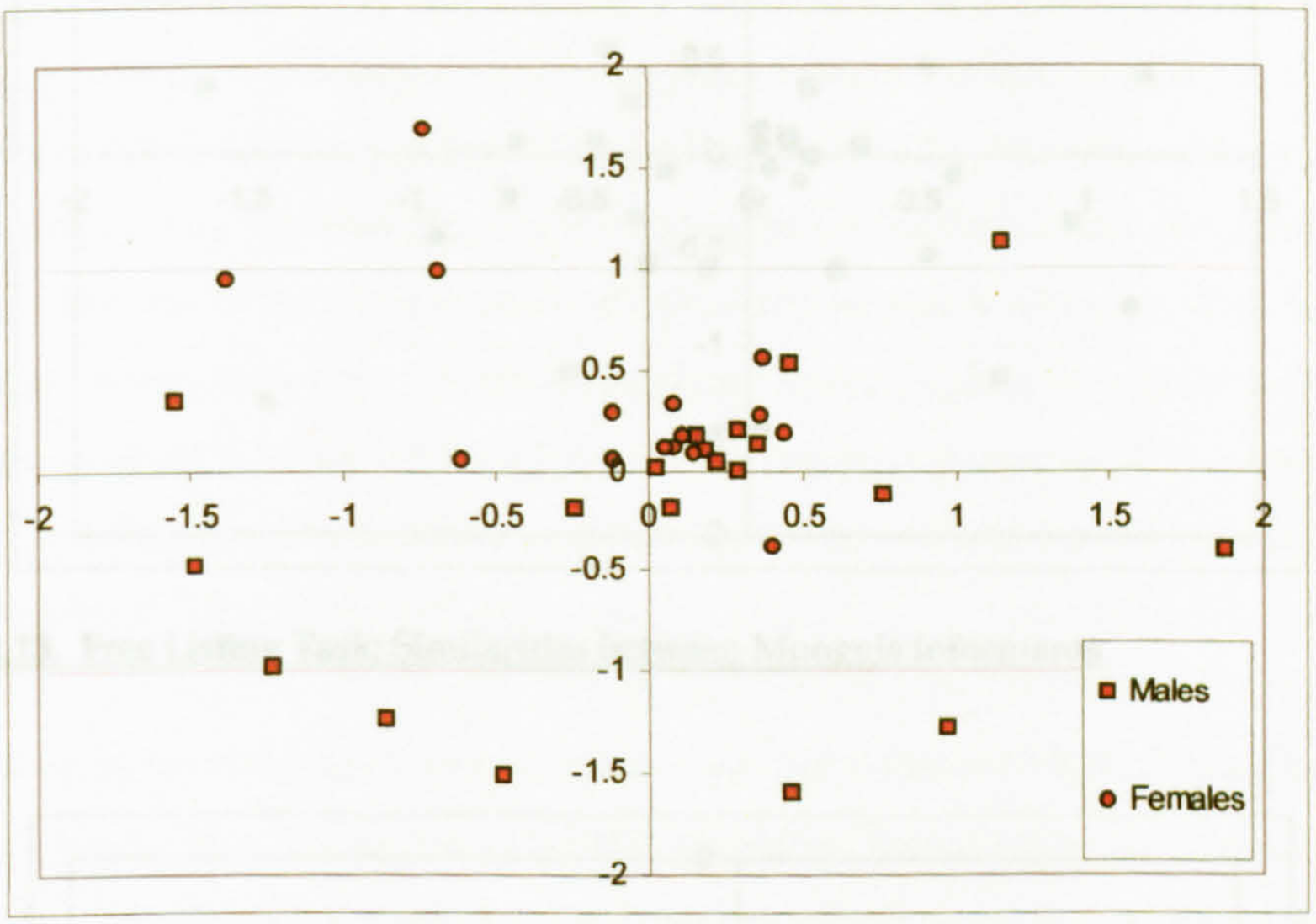

Figure 4.2.12. Free Listing Task: Similarities between Melangkap informants

Adults have a more differentiated vocabulary of plant names, but the direction of diversification is different for men and women. The women tend to cluster together, while the men form another loose cluster. There were however, only five Adult women compared to ten Adult men in the Melangkap sample. This differences in the direction of diversification between men and women is not the case for the Monggis (see Figure 4.2.13) and Kiau (see Figure 4.2.14) samples.

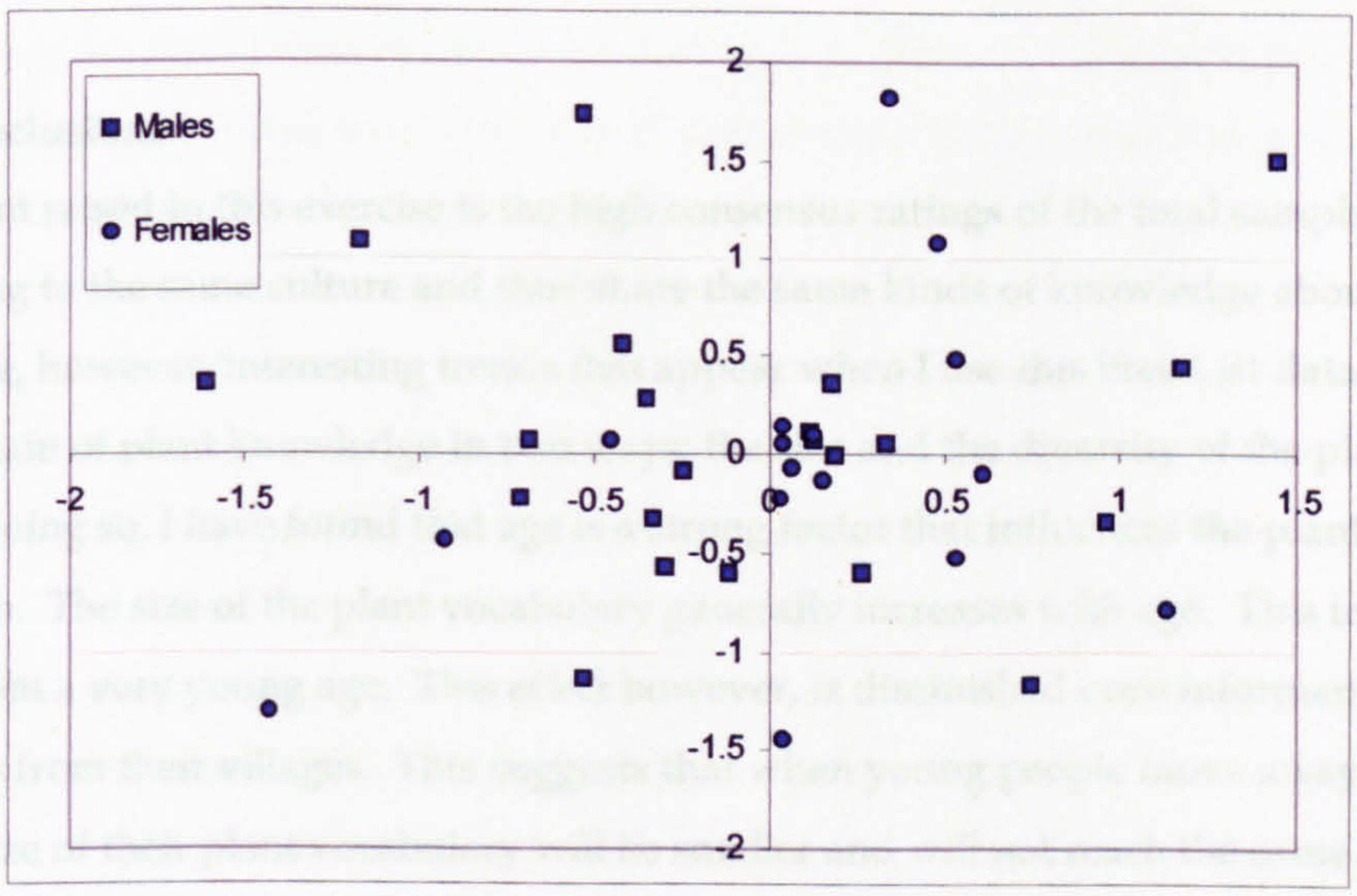

Figure 4.2.13. Free Listing Task: Similarities between Monggis informants

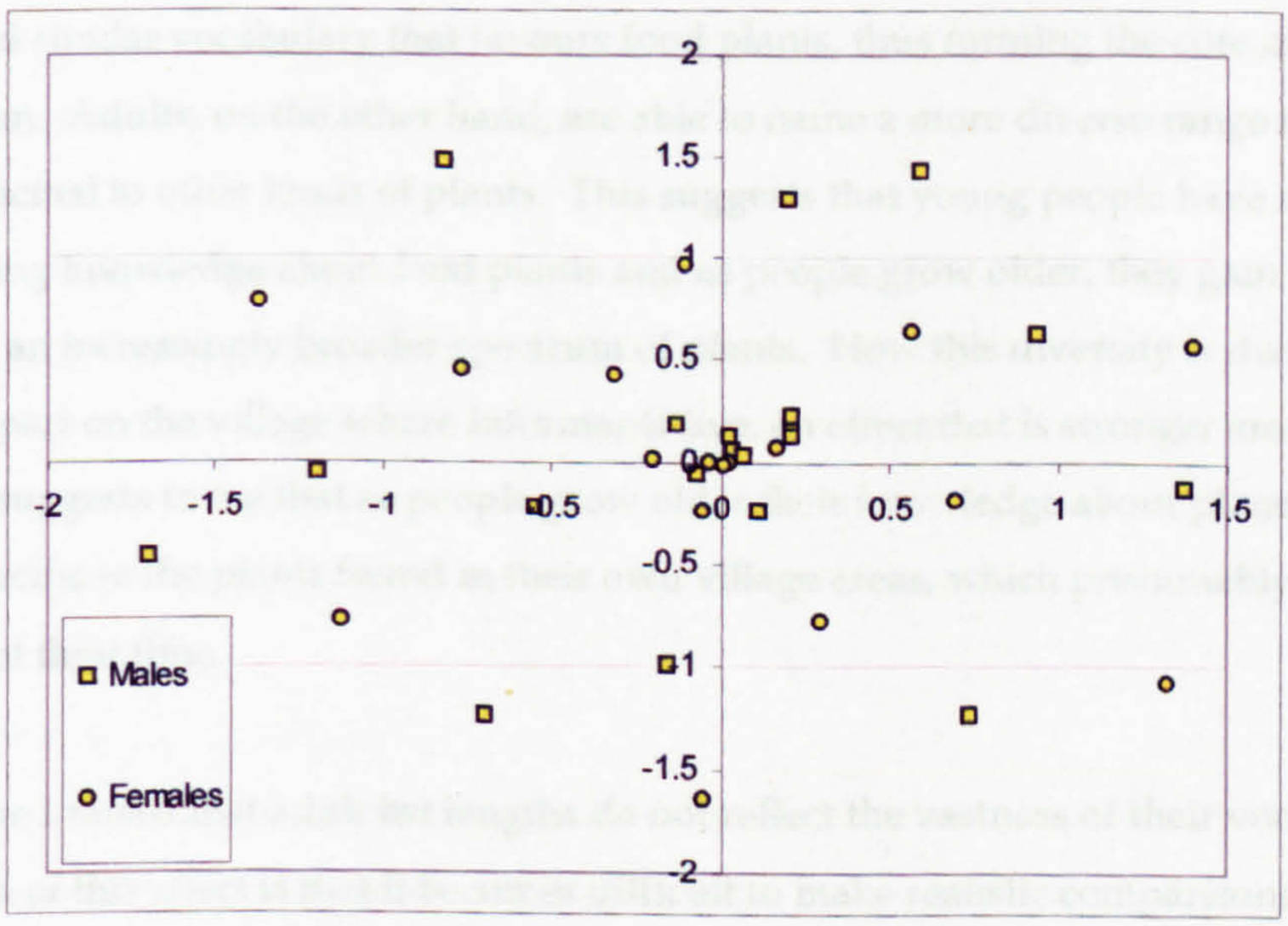

Figure 4.2.14. Free Listing Task: Similarities between Kiau informants

Both the Monggis (38 informants) and Kiau (35 informants) have a core that is comprised of young people, whereas Adults have more differentiation in the taxa they mentioned. The differentiation however, does not seem to be based on gender. This is clearest in the Kiau sample where Adult men (12 informants) and women (11 informants) exhibit vocabularies that are diverse or similar irrespective of gender. In other words, there is no clustering according to gender.

Free Listing: conclusions

The primary point raised in this exercise is the high consensus ratings of the total sample – all informants belong to the same culture and thus share the same kinds of knowledge about plant names. There are, however, interesting trends that appear when I use this Free List dataset to explore this domain of plant knowledge in two ways: the size and the diversity of the plant vocabulary. In doing so, I have found that age is a strong factor that influences the plant names listed by a person. The size of the plant vocabulary generally increases with age. This increase can start even from a very young age. This effect however, is diminished once informants have been living away from their villages. This suggests that when young people move away from the village, the size of their plant vocabulary will be smaller and will not reach the same levels as their counterparts who still live in the village.

I also found the diversity of the plant vocabulary generally increases with age. Young people have a smaller and similar vocabulary that favours food plants, thus forming the core of the total sample distribution. Adults, on the other hand, are able to name a more diverse range of plants, from food to medicinal to other kinds of plants. This suggests that young people have already begun accumulating knowledge about food plants and as people grow older, they gain knowledge about an increasingly broader spectrum of plants. How this diversity is distributed depends in some part on the village where informants live, an effect that is stronger among adults. This also suggests to me that as people grow older their knowledge about plants becomes more specific to the plants found in their own village areas, which presumably, is where they spend most of their time.

I return to the issue I raised that adult list lengths do not reflect the vastness of their vocabularies. One interpretation of this effect is that it becomes difficult to make realistic comparisons between vocabularies of different adults because these free lists reveal only a fraction of the total 500 or more unique taxa an adult vocabulary is purported to have. I am inclined to concede this may be an effect of my methodology and certainly future testing needs to be conducted to address this issue.

Another, more provocative, interpretation is that the comparatively short adult list lengths actually reflect the level of fragmentation in the total picture of Dusun plant knowledge. As a matter of fact, there is no reason to believe that an adult list length is supposed to accurately reflect the size and diversity of his or her total plant vocabulary. Children begin with similar kinds of plant vocabularies that continue to diversify according to circumstances found in their normative reality. By adulthood, these people would have developed differentiated roles,

concepts, and places whether inside or outside of their village. An adult free list is therefore a particularised expression of his or her "social place" that constrains the salience of, and access to, a larger body of shared plant knowledge. A collection of adult free lists would each represent fragments of the whole, such that a fuller patchwork of a Dusun plant vocabulary can be collated when all these fragments are combined in a comparative analysis such as this one[14]. In this case, I would argue the diversity between adult free lists found in this task is a reasonably accurate, albeit preliminary, picture of the level of fragmentation in Dusun plant vocabularies.

This relates to a final point I want to make at this stage: young people, and especially children, exhibit a large degree of bilingualism in their free lists. Children tend to use more Bahasa Malaysia names than adults, presumably as a result of schooling where Bahasa Malaysia is the main teaching medium. I do not interpret this as a kind of linguistic contamination because these informants do flip easily between one language and another (even in mid-sentence) in an effort to mobilise a wider vocabulary for communication. Children schooling away from their home village however, listed food plants not normally found in the village such as apples and Chinese broccoli, and these taxa most certainly were not found in any of the adult free lists.

I swiftly caution any predisposition to attribute the age effect found herein to be a function of the normal learning curve because children around age 10 can already potentially match the adult plant vocabulary, and certainly, the gradient of learning is very steep from an early age onwards. In other words, and as I will demonstrate in the following sections, the age variable incorporates other sorts of variables that can present themselves at different stages of a person's lifespan.

TASK TWO: SPECIMEN IDENTIFICATION

This task was set up to provide a point of comparison against the plant identification task. In other words, I wanted to see if informants could identify the same test thirty plants when presented as voucher specimens. Informants were not tested on *torintid* (11), *tindalat-dalat* (13), *sogumau* (22), and *rumun kilau* (29), for which there were no voucher specimens (see Table 4.2.7). The 26 voucher specimens were randomly divided into five groups, and each group was arranged in a separate room. Each specimen was mounted and numbered, and no other writing or markings were present. Informants viewed the specimens in a randomised sequence. At each specimen, informants were asked if they recognised the plant, provide a name, and describe the life form. Informants were also asked if they knew any uses for this plant, and to describe the use in terms of categories (e.g. medicinal, food, construction). We found that, on average, informants would take about thirty minutes to complete this task.

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[14] In relation to the Omniscient Speaker-hearer debate (Berlin, 1992), the whole body of Dusun plant knowledge is the theoretical union of all individual fragments, including both shared and specialised knowledge

Recognition is measured as the number of positive identifications (ids) made by an informant, meaning that the informant could both recognise the specimen and provide the correct local name. I use the terminology "correct name" to refer to the name attributed to a taxon by the most number of informants. Primary names (e.g. *tapayas* instead of *tapayas kusai*) and abbreviations (e.g. *tagu* instead of *lintagu*) were accepted as correct names. Bahasa Malaysia names (e.g. *halia* for the Dusun name *layo*) were also accepted as correct names. All names were checked for synonyms in two ways: first by reviewing the synonyms found in the PEK database according to village, and second by post-test interviews with other villagers from the same area where the informant is from. After responses were balanced against synonyms, I found that all 26 specimens were attributed "correct names" (meaning that there were no cases where opinions on the name of a taxon were divided by less than 70% of informants who gave a name). In the case where informants recognised the specimen but were unable to provide a name, this was counted as a negative response. In the case where informants recognised the specimen but provided the wrong name, this was also counted as a negative response. Table 4.2.13 shows the total number of positive ids for each specimen (see also Figure 4.2.15).

Table 4.2.13. Specimen Id Task: Number of positive identifications for each specimen

No	Dusun name[15]	No of positive ids	% of positive ids	Notes
1	Rombisan	49	44	
2	Timbalung Lanut	21	19	
3	Binuang	8	7	Below std dev
4	Rongguol	71	63	
5	Layo aragang	81	72	Above std dev
6	Kulung-kulung	50	45	
7	Tubo	47	42	
8	Lintagu	52	46	
9	Morogison	16	14	Below std dev
10	Rampah-rampah	26	23	
12	Kosup	17	15	Below std dev
14	Kiri-kiri	74	66	
15	Tapayas Kusai	104	93	Above std dev
16	Gunaton	19	17	
17	Lias	41	37	
18	Soronipon	51	46	
19	Dokarok	42	38	
20	Buntui	8	7	Below std dev
21	Pohuo	95	85	Above std dev
23	Gosing	82	73	Above std dev
24	Dalai	87	78	Above std dev
25	Tobu-tobu	31	28	
26	Tali-tali	36	32	
27	Togiung	62	55	
28	Sampit-sampit	16	14	Below std dev
30	Tonsisilou	15	13	Below std dev
	Mean	46.20		
	Std deviation	28.52		

There are five specimens in the upper quadrant positive id scores (higher than the standard deviation): *tapayas kusai* (93%), *pohuo* (85%), *dalai* (78%), *gosing* (73%) and *layo aragang* (72%). These are the most recognised specimens, all of which, are plants found growing within the vicinity of most village areas and in swidden fields. Except for *layo aragang*, the four other plants were published in the Plant Manual.

[15] Table 4.2.7 for scientific names

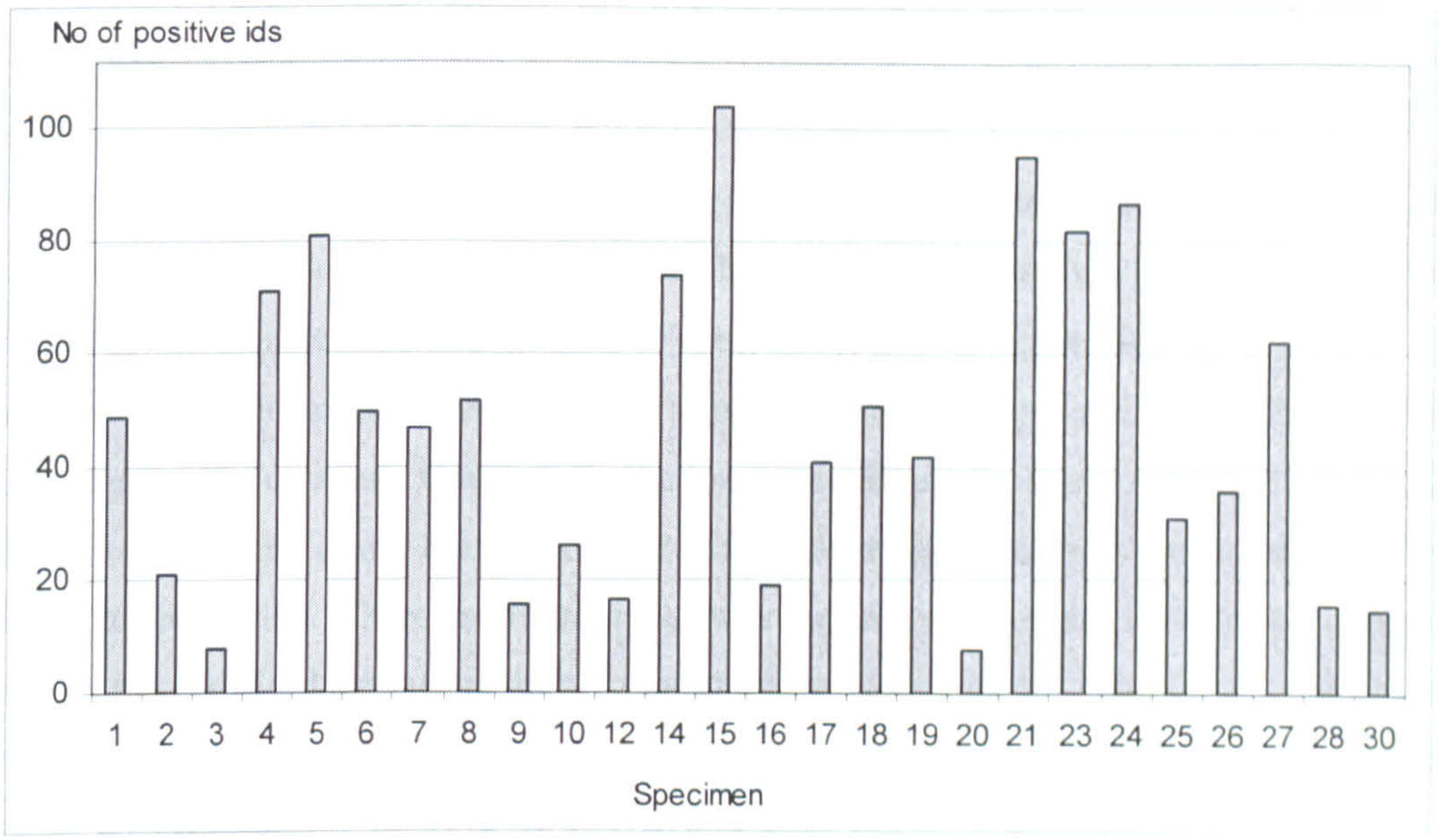

Figure 4.2.15. Specimen Id Task: Number of positive ids according to taxa

There are six specimens in the lowest quadrant (number of positive ids below the standard deviation): *binuang* (7%), *buntui* (7%), *tonsisilou* (13%), *morogison* (14%), *sampit-sampit* (14%) and *kosup* (15%). Table 4.2.14 shows the breakdown of responses to the six least recognised specimens. In all six cases Adult males provided about half or most of the positive ids, with nominal or no positive ids from Teens and Children.

Table 4.2.14. Specimen Id Task: Breakdown of positive ids for the six least recognised specimens

No	Dusun name[16]	No of positive ids						Total no of positive ids (%)
		Adults (20-70)		Teens (13-19)		Children (6-12)		
		Male	Female	Male	Female	Male	Female	
3	Binuang	5	3	0	0	0	0	8 (7%)
20	Buntui	6	2	0	0	0	0	8 (7%)
30	Tonsisilou	10	5	0	0	0	0	15 (13%)
9	Morogison	12	1	0	2	1	0	16 (14%)
28	Sampit-sampit	11	2	0	2	1	0	16 (14%)
12	Kosup	11	6	0	0	0	0	17 (15%)

It is interesting to note in the case of *sampit-sampit*, there were only three positive ids from the Melangkap cluster, namely from Lorin Lugas and his two children Florida and Helmy. Helmy is the only informant in the Children's group who made positive ids in this category of least recognised specimens, which are for *sampit-sampit* and *morogison*. Another interesting case to

[16] Table 4.2.7 for scientific names

note is that all the positive ids for *kosup* came from the Kiau cluster, except for one positive id from Monggis.

The highest number of positive ids is by Ginting Gumu (aged 43) from Kiau who recognised and correctly named 23 out of the 26 specimens (see Figure 4.2.16). There are 23 informants who scored positive ids on at least 16 out of the 26 specimens, that is, higher than the standard deviation of this distribution. All of these 23 informants in the upper quadrant come from the Adult category (20-70 years). Conversely, the lowest number of positive ids is by Jude Justin (aged 9) from Kiau and Hanif Matamin (aged 7) from Monggis, who both made one positive id out of the 26 specimens. There are 16 informants in the lowest quadrant, all of whom scored lower than the standard deviation, that is, they managed to recognise and correctly name less than 6 out of the 26 specimens. These 16 informants are from the Under 19 category (6-19 years), except for four informants who are Adults (two of them being 67 years old).

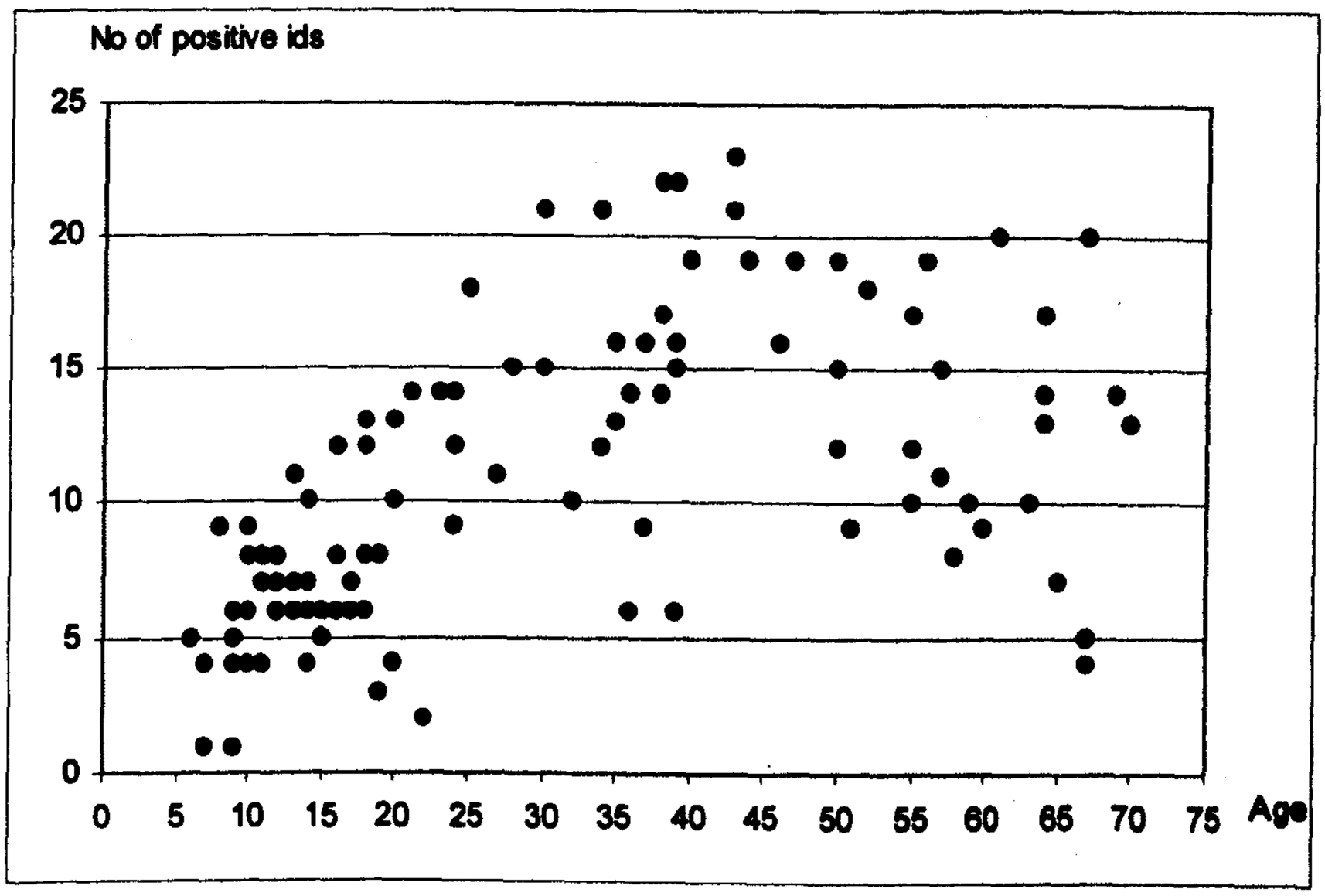

Figure 4.2.16. Specimen Id Task: Relationship between Age and number of positive ids according to informants

Specimen Id Task: the age effect

The mean number of positive ids for all the 26 specimens across informants by age and gender is shown in Table 4.2.15. There is a clear age effect, with Adults being able to positively recognise and correctly name about half (53%) of the total specimens viewed. The mean positive ids for Teens is substantially lower than Adults, being able to positively recognise and correctly identify about 30% of total specimens viewed. Analysis using t-tests showed the difference between Adults and Teens is statistically significant ($t = 0.00000000013$; $p < 0.001$). Similarly, the mean

positive ids for Children is also much lower than Adults, being able to positively recognise and correctly name about 22% of the total specimens viewed. T-tests found the difference between Adults and Children to be statistically significant ($t = 0.00000000000000504$; $p < 0.001$). The Under 19s confirms this trend, being able to positively recognise and correctly name about 26% of specimens viewed. T-tests confirmed the difference between Adults and Under 19s to be statistically significant ($t = 0.00000000000000020$; $p < 0.001$). Evidently, Adults can recognise and correctly name more specimens compared to other age groups.

Table 4.2.15. Specimen Id Task: Mean positive ids according to age groups and gender

Age	No of informants	Mean positive ids	Std deviation
All (6 – 70)	112	10.72	5.38
Male	63	11.22	5.71
Female	49	10.16	4.90
Adults (20-70)	64	13.81	4.93
Male	39	14.03	5.12
Female	25	13.24	4.62
Teens (13-19)	24	7.67	2.68
Male	7	7.71	3.09
Female	17	7.65	2.60
Children (6-12)	24	5.67	2.26
Male	17	5.82	2.43
Female	7	6.00	2.16
Under 19	48	6.67	2.65
Male	24	6.38	2.72
Female	24	7.17	2.55

Among the younger informants, t-tests showed the difference between Teens and Children to be statistically significant ($t = 0.01649$; $p < 0.05$), even though the effect was not as strong as comparisons done against the Adult group previously. In other words, Children could recognise and correctly name the fewest number of specimens compared to other age groups.

Intriguingly, analysis with Pearson's product moment coefficient shows only a mediocre positive correlation between age and positive ids ($r^2 = 30$). In other words, only about 30% of the variance can be attributed to age, such that there is only 30% likelihood the ability to recognise and correctly name specimens will increase with age.

Specimen Id Task: the gender effect

The gender effect is less clear than the age effect (see Table 4.2.15). In the total sample of informants, Males are able to recognise and correctly name about 43% of specimens compared to Females who can recognise and name about 39% of specimens. Analysis using t-tests found the difference between Males and Females in the total sample to be not significant ($t = 0.294$; $p >$

0.05), in that there is no real difference between Males and Females in their ability to recognise and correctly name specimens. In all of the Adult, Teen, Children and Under 19 samples, there is very little indication that Males and Females are different in their ability to make a positive id on a specimen. There is no statistically significant difference between Males and Females in the Adult category ($t = 0.52755$; $p > 0.05$); in the Teen category ($t = 0.96066$; $p > 0.05$); in the Children category ($t = 0.86367$; $p > 0.05$); or in the Under 19 category ($t = 0.33579$; $p > 0.05$). In short, there is no statistically significant gender effect.

Specimen Id Task: the village effect

Mean positive id scores according to village cluster is presented in Table 4.2.16. Kiau scored the highest being able to recognise and correctly name 49% of specimens compared to Melangkap (42%) and Monggis (34%).

Table 4.2.16. Specimen Id Task: Mean no of positive ids according to village in the total sample

Village	No of informants	Mean no of positive ids	% of positive ids
Kiau	37	12.65	49%
Melangkap	35	10.80	42%
Monggis	40	8.88	34%

T-tests however reveal that the difference between Kiau and Melangkap is not statistically significant ($t = 0.14847$; $p > 0.05$), and the difference between Melangkap and Monggis is not statistically significant ($t = 0.11836$; $p > 0.05$). The difference between Kiau and Monggis is however found to be statistically significant ($t = 0.00153$; $p < 0.05$), that is to say informants from Kiau are able to recognise and correctly name more specimens that informants from Monggis.

A closer look at the breakdown by village cluster is presented in Table 4.2.17, which focuses only on the Adult samples of each village cluster. This is done because half the Melangkap sample comprises informants less than 19 years, thus an examination of the Adults sample may reveal a stronger effect according to village cluster.

Table 4.2.17. Specimen Id Task: Mean no of positive ids according to village in the Adults sample

Village Adults	No of informants	Mean no of positive ids	% of positive ids
Kiau	24	15.30	59%
Melangkap	15	16.10	62%
Monggis	25	10.88	42%

Table 4.2.17 shows a substantial increase in the mean positive id score for the Adult sample compared to the total sample presented in Table 4.2.16. Melangkap Adults have the highest score with 62% compared to Kiau Adults (59%) and Monggis Adults (42%). T-tests reveal no statistically significant difference between Melangkap Adults and Kiau Adults ($t = 0.59667$; $p > 0.05$). There is however a statistically significant difference between Kiau Adults and Monggis Adults ($t = 0.00088$; $p < 0.01$), as well as between Melangkap Adults and Monggis Adults ($t = 0.00113$; $p < 0.05$). In other words, when we look at the Adult sample only, the village effect becomes clearer. Kiau and Melangkap Adults are not significantly different in terms of the numbers of specimens they can recognise and correctly name, but both Kiau and Melangkap Adults are able to recognise and correctly name more specimens than their Monggis counterparts.

The same analysis was conducted for Under 19 samples according to village, but no statistically significant difference was found between Under 19 informants from Kiau and Melangkap ($t = 0.14202$; $p > 0.05$), or Under 19s from Kiau and Monggis ($t = 0.06551$; $p > 0.05$), or Under 19s from Melangkap and Monggis ($t = 0.11536$; $p > 0.05$). No analysis was carried out for Teens or Children samples according to village because sample sizes were too small.

Specimen Id Task: conclusions

Overall, the mean positive id score for the total sample is low (41%), such that informants are able to recognise and correctly name not even half of the total number of specimens. Even the mean positive id score for Adults is considerably low (53%) - barely half of the total number of specimens. This is probably a good space to mention the unexpected degree of disbelief we encountered in our informants, particularly among adults, when they were faced with voucher specimens. As far as some informants were concerned, these voucher specimens – two-dimensional fragments of a plant that have been dried into an odourless and uniform brownish hue - were strange and curious ways to present plants. Indeed, a few such informants expressed their disapproval in these "dead and dried plants" and intrigue as to why anyone needed to keep such "useless" plants. I do not hesitate in attributing the overall low positive id scores to the foreign interface of seeing plants as voucher specimens, and am greatly reassured that there were nevertheless a handful of informants who were very good at recognising voucher specimens.

Given the ambiguity in the appearances of the voucher specimens, there certainly is a degree of misrecognition, where informants mistook the specimen for another plant. In these cases, especially among Adults, misrecognition of a specimen is often followed by a fluent description of the plant, even though the informant is describing the properties of a plant other than the one

on the specimen. This brings me to conclude that these informants can describe plants – it is just difficult for them to identify plants when presented as voucher specimens.

Much like the Free Listing dataset, the Specimen Id dataset exhibits a strong age effect in that adults are able to recognise and name more specimens compared with younger people. However, the 30% correlation between age and positive id scores supports my earlier suspicion that age is not the dominant factor that influences plant knowledge. Indeed there are other forces at play (in this case, I have suggested familiarity with the medium of voucher specimens to be a factor). Another effect is that adults from the west side (Kiau and Melangkap) of Kinabalu can name more specimens than adults from the east side (Monggis) of Kinabalu. Kiau and Melangkap are much closer in distance to Kinabalu Park and both share historical and contemporary involvement in scientific expeditions to Kinabalu. I did find more awareness and participation in PEK collections in Melangkap, and a number of Kiau Dusuns were working in the PEK and the Kinabalu Park Herbarium at the time of testing. I suspect the exposure to botanical plant collecting techniques potentially makes it easier for informants from these villages to identify voucher specimens.

TASK THREE: PLANT IDENTIFICATION

The Plant Identification Task is the main task in the plant trail test. Informants were escorted through a designated nature walk, along which grew the thirty test plants (see Figure 4.2.17). The list of plants is presented in Table 4.2.7. The sequence by which each informant viewed the thirty plants was randomised to counterbalance any carry-over effects.

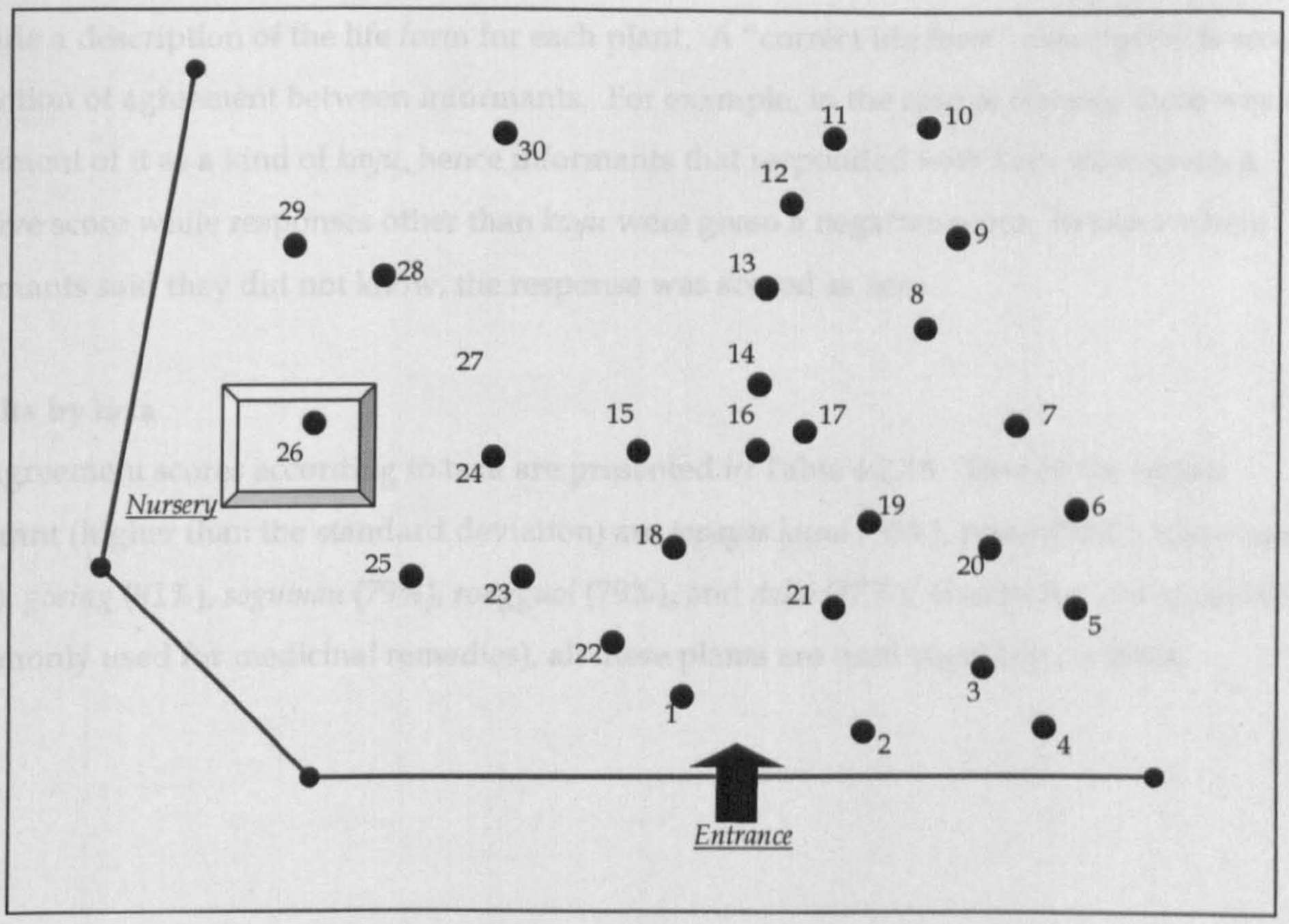

Figure 4.2.17. Plant Id Task: Plant trail with thirty test plants (not to scale)

The aim of this task is to collect data on two aspects of plant knowledge: naming and use. At each plant informants were asked if they recognised the plant, could provide a name, and describe the life form[17]. Informants were also asked if they knew any uses for this plant, to describe these uses in detail (e.g. parts used, method of preparation), and to describe the last time they used this plant. Many informants touched the plant, walked around it, smelled it, examined the flowers and leaves, and in one case, an informant actually uprooted the plant to view the roots[18]. We found that, on average, and depending on age, informants would take about one hour to complete this task. The results of this task are presented as two datasets: naming and use.

Plant Id Task: naming

A positive identification is scored as the ability to provide a "correct name"[19] for the plant, whether in Dusun or Bahasa Malaysia. Abbreviations (e.g. *rampah* instead of *rampah-rampah* or *guol* instead of *rongguol*) were accepted as positive identifications. In the cases of *layo aragang* and *tapayas kusai*, primary names were accepted as positive identifications. Plant synonyms were checked in two ways: by cross-referencing the PEK database, and by interviewing other villagers

[17] Life form is scored as a description of a plant's stem habit, which corresponds to the morphology of a plant's stem
[18] Fortunately, we managed to replant it so other informants could still view it
[19] Again, a "correct name" is used to refer to the name that is attributed to the plant by the most number of informants

from the same area at a later date. A secondary aspect of the Naming dataset is the ability to provide a description of the life form for each plant. A "correct life form" description is scored as a function of agreement between informants. For example, in the case of *binuang* there was more agreement of it as a kind of *kayu*, hence informants that responded with *kayu* were given a positive score while responses other than *kayu* were given a negative score. In cases where informants said they did not know, the response was scored as zero.

Results by taxa

The agreement scores according to taxa are presented in Table 4.2.18. Taxa in the upper quadrant (higher than the standard deviation) are *tapayas kusai* (98%), *pohuo* (95%), *layo aragang* (92%), *gosing* (91%), *sogumau* (79%), *rongguol* (79%), and *dalai* (77%). Except for *gosing* and *dalai* (commonly used for medicinal remedies), all these plants are used regularly for food.

Table 4.2.18. Plant Id Task: Positive identifications and life form descriptions for each taxa

No	Dusun name[20]	No of positive ids	%	Agreement on life form	%
1	Rombisan	64	57	77	69
2	Timbalung Lanut	31	28	22	20
3	Binuang	36	32	66	59
4	Rongguol	88	79	40	36
5	Layo aragang	103	92	63	56
6	Kulung-kulung	47	42	57	51
7	Tubo	25	22	44	39
8	Lintagu	55	49	37	33
9	Morogison	13	12	53	47
10	Rampah-rampah	17	15	42	38
11	Torintid	44	39	24	21
12	Kosup	20	18	29	26
13	Tindalat-dalat	30	27	56	50
14	Kiri-kiri	74	66	56	50
15	Tapayas Kusai	110	98	45	40
16	Gunaton	35	31	43	38
17	Lias	65	58	35	31
18	Soronipon	48	43	60	54
19	Dokarok	71	63	68	61
20	Buntui	69	62	60	54
21	Pohuo	106	95	35	31
22	Sogumau	89	79	65	58
23	Gosing	102	91	75	67
24	Dalai	86	77	64	57
25	Tobu-tobu	46	41	40	36
26	Tali-tali	46	41	46	41
27	Togiung	62	55	49	44
28	Sampit-sampit	8	7	27	24
29	Rumun kilau	41	37	33	29
30	Tonsisilou	42	38	55	49
	Mean	**55.77**		**48.87**	
	Std deviation	**29.15**		**15.05**	

Notes	
	Below std deviation
	Above std deviation

There is a strong correlation of 71% between positive ids on taxa in this task with the positive ids made in the Specimen Identification Task (taking into account the missing voucher specimens for taxa 11, 13, 22, and 29; $r^2 = 71$). In other words, there is a 71% chance that taxa recognised in its natural habitat will also be recognised as voucher specimens. Of the 7 taxa in the upper quadrant in this dataset, *tapayas kusai*, *pohuo*, *gosing* and *dalai* also scored in the upper quadrant of positive id scores in the Specimen Id Task. This is a remarkably strong correlation in spite of the difficulties some informants had in the face of voucher specimens in the Specimen Id Task.

[20] See Table 4.2.7 for scientific names

Figure 4.2.18 shows the Naming distribution according to taxa. Note the spiked levels of variability in the distribution. Evidently some taxa (e.g. *tapayas kusai*) are very well known plants while other taxa (e.g. *kosup*) are recognised only by very few informants.

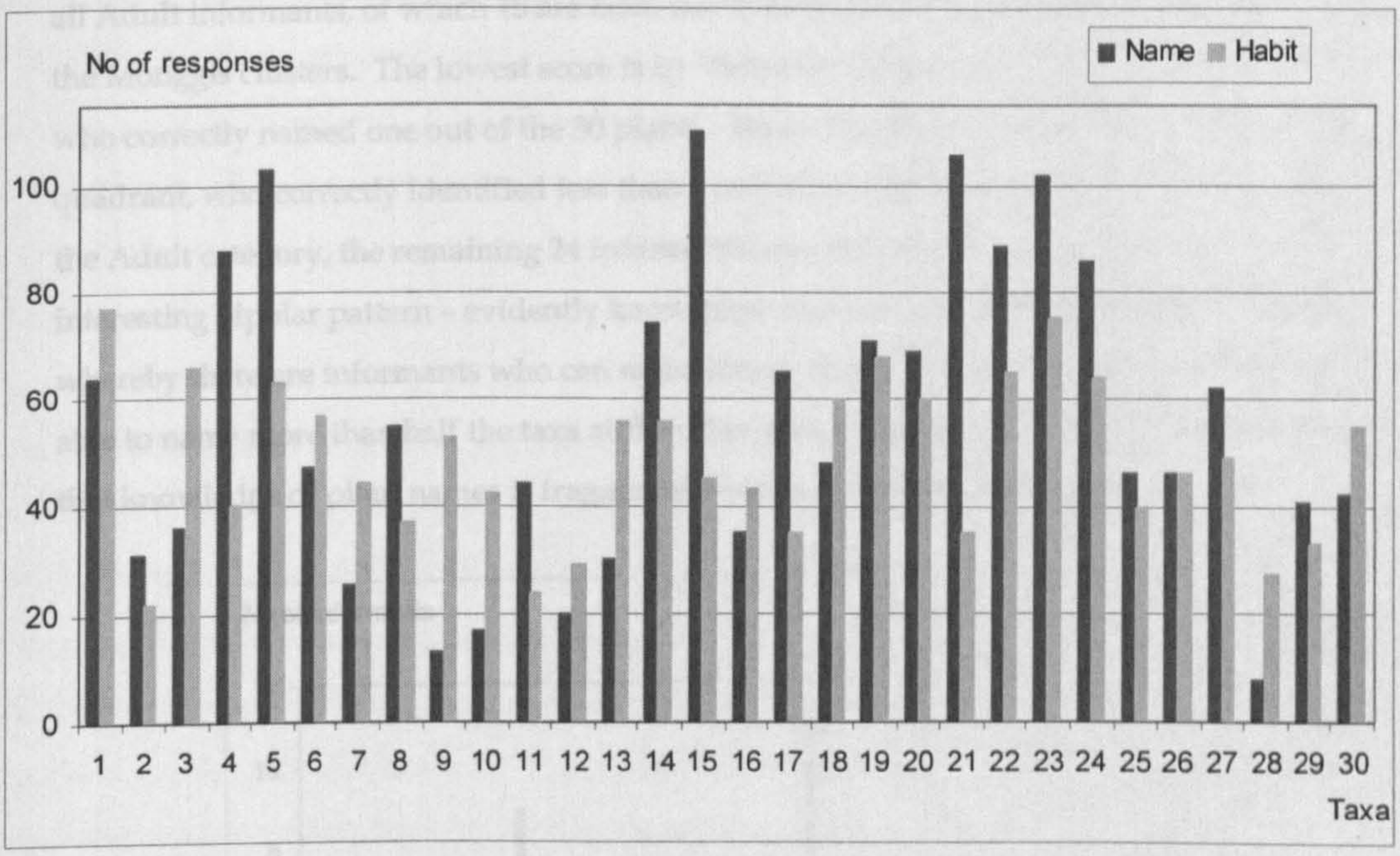

Figure 4.2.18. Plant Id task: Naming and Habit distributions according to taxa

The life form results (scored as stem habit), as shown in Figure 4.2.18, are surprisingly low in contrast to the Naming distribution. Taxa in the upper quadrant of agreement scores on Habit are *rombisan* (69%), *gosing* (67%), *dokaruk* (61%), *binuang* (59%), *sogumau* (58%), and *dalai* (57%). The highest level of agreement is only 69% that *rombisan* is a kind of *sakot*. Barely more than half (59%) of the total sample could agree that *binuang* (a tree of more than 18 meters in height at the time of testing) is a kind of *kayu*. There were also several recurrent irregularities in descriptions of life form across informants, which I will expand on shortly. Nevertheless, despite the overall lower results, the Habit distribution is more evenly distributed across taxa (standard deviation of the Habit distribution is lower than the Naming distribution, thus Habit scores are more tightly distributed).

There is a weak correlation between Naming and Habit ($r^2 = 15$) according to taxa, with only 15% probability that a named plant is also a plant that informants can describe it's life form. On the contrary, very well known plants (e.g. *pohuo*) can also be plants with great disagreement over its life form description. I contend that Naming and Habit are not interrelated abilities: knowledge of plant names does not imply knowledge of life form, nor vice versa.

Results by informants

Among informants, the highest Naming score is by Taradas Maduli (aged 48) from Kiau Nuluh, who correctly named 29 out of 30 plants. There are 33 informants (29%) in the upper quadrant, who managed to correctly name more than 22 out of the 30 plants (see Figure 4.2.19). These are all Adult informants, of which 15 are from the Kiau cluster, 12 from the Melangkap and 6 from the Monggis clusters. The lowest score is by Victor Chu (aged 22), from the Monggis cluster, who correctly named one out of the 30 plants. There are 25 informants (22%) in the lowest quadrant, who correctly identified less than 8 out of the 30 plants. Except for Victor, who is in the Adult category, the remaining 24 informants are all Under 19s. Figure 4.2.19 shows an interesting bipolar pattern – evidently knowledge of plant names is not evenly distributed, whereby there are informants who can name lots of taxa at one pole and informants who are not able to name more than half the taxa at the other pole. This provides a very strong indication that knowledge of plant names is fragmented and not normally distributed.

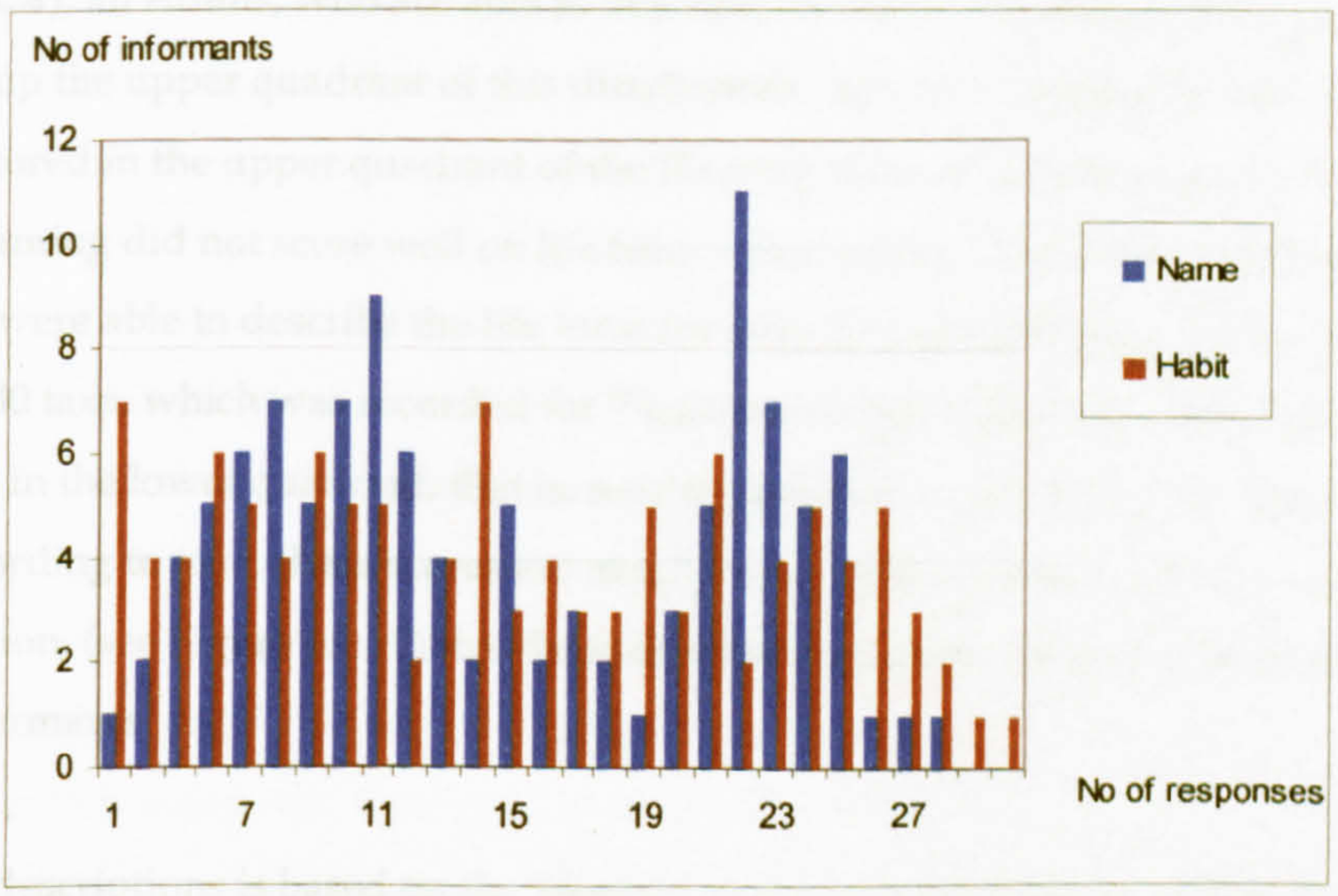

Figure 4.2.19. Plant Id Task: Naming and Habit responses according to informants

The mean positive id score for the total sample (50%) in the Plant Id task is not much higher than the mean positive id score in the Specimen Id Task (41%) (compare Table 4.2.19 with Table 4.2.15). Thus for both exercises, on average, informants could identify not more than half out of the 30 taxa, whether voucher specimen or in the natural setting. I found the mean positive id score for the total sample in the Plant Id task to be significantly higher than the mean score in the Specimen Id task ($t = 0.00000000000000000001973$; $p < 0.01$). This statistically significant finding is replicated across all age groups, where informants can recognise more plants in the natural setting than as voucher specimens (for Adults: $t = 0.00000000000001526$; $p < 0.01$; for Teens: t =

0.0001993; $p < 0.01$; for Children: $t = 0.00005298$; $p < 0.01$). As suspected, informants are indeed better able to identify plants in the natural setting than when presented as voucher specimens. There is, however, a strong correlation between informants' ability to make positive identifications in this task and the Specimen Id task ($r^2 = 69$). In other words, there is 69% likelihood that informants who make positive ids on taxa in the natural setting will also be able to make a positive id on taxa as voucher specimens. This finding corroborates the 71% correlation according taxa, which I have already described. It provides crucially strong verification that informants are disclosing reliable and consistent information despite some difficulties with voucher specimens.

In the case of life form (scored as stem habit), the highest agreement score is by Ekol Kunggai (aged 59) from the Monggis cluster who described the life form for 29 out of 30 taxa. There are 25 informants (22%), all Adults, who are able to describe life forms for at least 21 out of 30 taxa, thereby making up the upper quadrant of this distribution. Thirteen of these 25 informants (52%) had also scored in the upper quadrant of the Naming dataset. In other words, half of the top scorers on Naming did not score well on life form – as a matter of fact, there are top scorers on Naming who were able to describe the life form for only 2-7 out of 30 taxa. The lowest score was none out of 30 taxa, which was recorded for 7 informants (all Under 19). There are 21 informants (19%) in the lower quadrant, that is, scoring less than 4 out of 30 taxa. Much like the Habit results according to taxa, these scores are much lower than expected, and in contrast to the Naming distribution, (see Figure 4.2.19) the Habit distribution is more evenly distributed across the sample of informants.

Scoring life form descriptions is based on the agreement between informants' responses whether a particular taxa is a kind of *kayu*, *wakau*, *sakot* or something else (see also chapter one). While the high scorers in the upper quadrant displayed a consistency in their responses, a number of other informants displayed irregularities in their descriptions of life form. The first type of irregularity is based on loaned terms from Bahasa Malaysia, whereby informants use Bahasa Malaysia equivalents of *rumput* (grass) and *pokok* (tree) in addition to the Dusun terms *sakot* (grass) and *kayu* (tree). For example, one informant described *morogison* as *rumput* and then *rampah-rampah* as *sakot*, insisting that *rumput* and *sakot* refer to slightly different characteristics of life form (even though *rumput* is the literal Bahasa Malaysia translation of the Dusun term *sakot*). It appears as though switching back and forth between languages serves to expand the vocabulary of life form classifications. Thus a non-prototypical *sakot* can be classified as a *rumput*, in other words meaning sort-of-*sakot*-but-not-quite. The second type of irregularity is based on using other aspects of the morphology to describe life form. The *tapayas* was referred to by a number of informants as a kind of *buah* (fruit). Other kinds of descriptions found across the 30 taxa include

batang (stem) and *pucuk* (shoot). This type of irregularity also includes matching the taxa with characteristics of other taxa, where *buntui* was described as a kind of *guol* (*rongguol* or taro), *tobu-tobu* was described as a kind of *poring* (bamboo), and *pohuo* was described as a kind of *pisang* (banana). One informant consistently described everything that he felt was neither *kayu, wakau* nor *sakot,* as a kind of *lalang* (*Imperata cylindrica*). The third type of irregularity is based on using a use category to describe life form, which in this case is *totonomon* (Dusun) or *tanaman* (Bahasa Malaysia), both meaning domesticated plant. *Guol, layo, tapayas, pohuo, dokaruk* and *sogumau* were described as *totonomon* or *tanaman* by a number of informants. Even though these same informants could describe other taxa according to the established classifications as *kayu, wakau* or *sakot,* they insisted that *guol* or *tapayas* did not fit these classifications, but were instead a kind of *totonomon*.

These irregularities permeate the Habit dataset, and are the secondary source of the overall low scores. The primary source is the "don't know" answers, otherwise scored as zero. In short, there are three kinds of informants: those who knew their life form descriptions, those who didn't know life form descriptions (mostly Under 19s), and those who are responsible for these irregularities. Instead of saying "don't know", these informants choose to impose their own interpretation of how this plant's life form is to be described. What strikes me the most with these irregularities, as I mentioned in Chapter One, is firstly, that they are reasonably consistent across informants. Secondly and taking into account this consistency, informants are incredulously inventive and treat the question of life form descriptions as flexible classifications. It is akin to the idea that whichever label "does the job" is good enough a name for that problematic life form classification. Surely enough, these invented classifications are indeed grounded in some kind of practical reality – *morogison* is a kind of grass but not quite exactly a *sakot,* so it is a kind of *rumput* (which ultimately is a grass anyway); *tapayas* does have fruits that are eaten, so it is a kind of fruit; *guol* is a staple crop so why can't it be a kind of *totonomon*? It represents a rather practical approach to classification – whichever domain of classification is most convenient, most accessible, and most easy, whether the language of life form or type of use or agricultural status, is the domain of classification, or conceptualisation, that informants will use to communicate details about this plant. This is the flip side to cognitive efficiency: cognitive association – rather than intellectually battle it out trying to dissect the properties of *tapayas* as either a *kayu* or a *sakot,* tapping into another category of appropriate descriptions (i.e. fruit) makes for faster and more effective communication.

There is a positive correlation between Habit and Naming ($r^2 = 40$) across informants (see Figure 4.2.20). Note the bipolarity in the distribution. There is a clear rift that separates informants who can name a plant and describe its life form from those who do not have this extent of knowledge.

It certainly suggests that only a particular group of people are in possession of knowledge about both plant names and habit (all of whom are Adults).

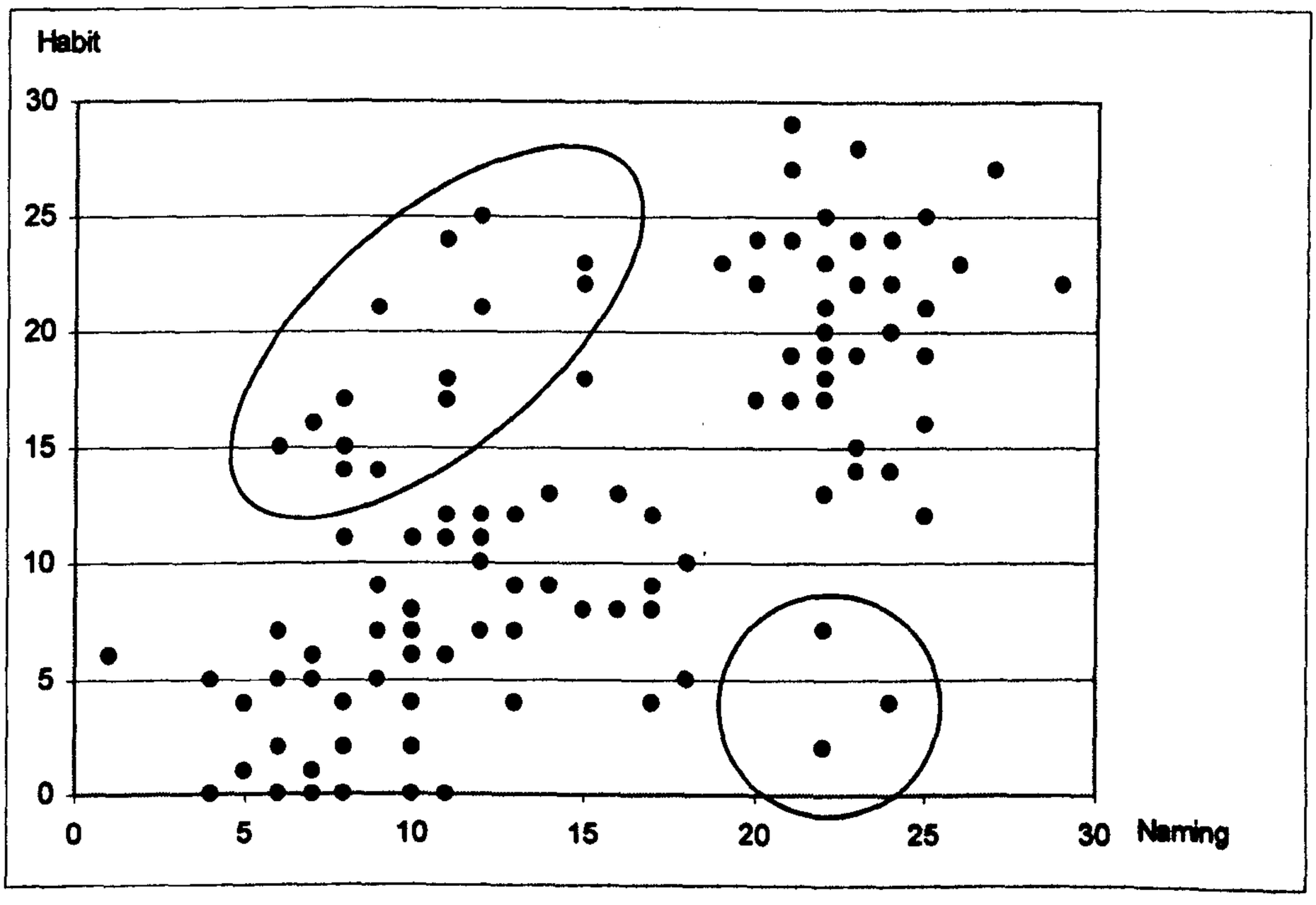

Figure 4.2.20. Plant Id Task: Relationship between Naming and Habit according to informants

There are also informants (circled) who seem to have an imbalance: a small group of them know their plant names but hardly anything about life form, while a much larger group aren't very good with plant names but are very good with life form descriptions. The latter group is comprised of a mix of people from teens to the elderly, both men and women, from all villages. For almost all of these informants, the Habit distribution is the only distribution where they scored in the upper quadrant.

Naming: the age effect

The Naming results according to age groups and gender are presented in Table 4.2.19. It is crucial to note that informants under the age of 19 years make up 43% of the total sample – in short, about half of the sample is comprised of young people (and 21% of the total sample are children under the age of 12 years), which could certainly account for the lower mean scores in the total sample (50%). An examination of the Adult sample reveals the mean positive id score to be substantially higher (65%).

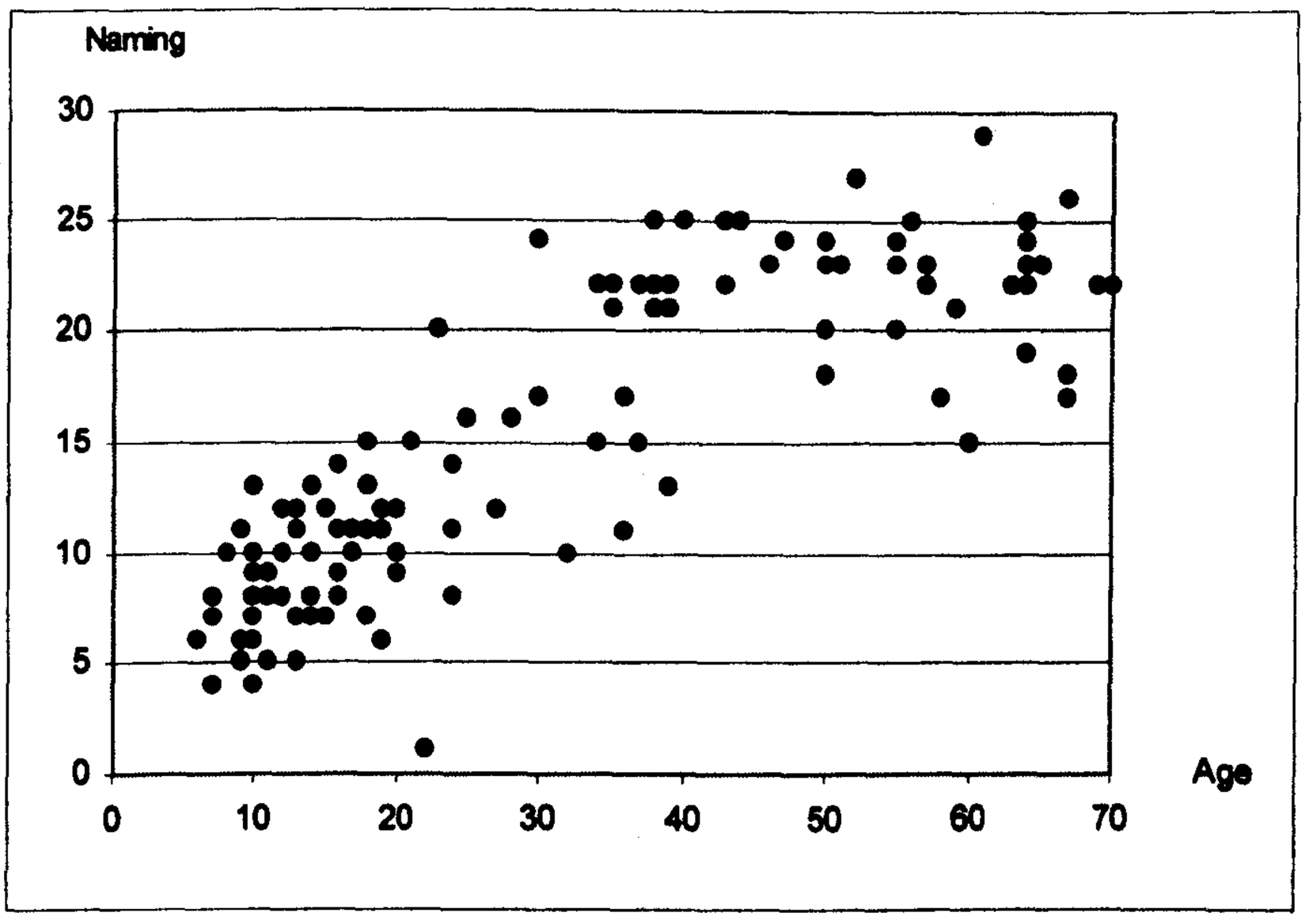

Figure 4.2.21. Plant Id Task: Relationship between Age and Naming

Indeed, the Adult category produced the highest mean positive id score compared to any of the other age groups. Analysis using t-tests showed that Adults recognised significantly more plants compared to Teens ($t = 0.00000000000000002468$; $p < 0.01$); compared to Children ($t = 0.000000000000000000000312$; $p < 0.01$), and compared to Under 19s ($t = 0.000000000000000000000717$; $p < 0.01$). The difference between Teens and Children is the smallest, but t-tests also confirmed that Teens are able to correctly recognise more plants than Children ($t = 0.009235846$; $p < 0.01$). In other words, age is a very strong factor that determines the ability to correctly name plants, with Adults being better able to recognise plants than any other age group.

Table 4.2.19. Plant Id Task: Mean positive ids according to age groups and gender

Age	No of informants	Mean positive ids	Std deviation
All (6 – 70)	112	14.94	6.91
Male	63	15.84	7.34
Female	49	13.78	6.20
Adults (20-70)	64	19.47	5.45
Male	39	20.21	5.64
Female	25	18.32	5.02
Teens (13-19)	24	10.04	2.66
Male	7	10.14	3.08
Female	17	10.00	2.57
Children (6-12)	24	7.75	2.47
Male	17	8.18	2.56
Female	7	6.71	2.06
Under 19	48	8.90	2.79
Male	24	8.75	2.80
Female	24	9.04	2.84

There is a strong correlation between age and ability to correctly name a plant ($r^2 = 69$), whereby there is a 69% likelihood that the ability to correctly name a plant increases with age (see Figure 4.2.21). In contrast to the Specimen Id task, the age effect for Naming is much stronger in this Plant Id task (30% correlation between age and ability to correctly name a plant in Specimen Id compared to 69% in this task). Thus in a natural setting, the older the informants then the more likely they are able to recognise a plant..

As I have already mentioned, Habit results are lower than the Naming scores (see Table 4.2.20). Adults were better at describing life form than any other age group, with Children being the poorest at judging life form. T-tests revealed statistically significant results for all age categories, such that Adults can describe life forms for more taxa than Under 19s ($t = 0.00000005140$, $p < 0.01$); and more than Teens ($t = 0.003796$; $p < 0.01$); and more than Children ($t = 0.0000000003313$; $p < 0.01$). Teens can describe the life forms for more taxa than Children ($t = 0.005677$; $p < 0.01$).

Table 4.2.20. Plant Id Task: Mean agreement on life form according to age groups and gender

Age	No of informants	Mean agreement	Std deviation
All (6 – 70)	112	12.71	8.03
Male	63	12.95	8.10
Female	49	12.41	8.02
Adults (20-70)	64	16.05	7.44
Male	39	15.74	7.60
Female	25	16.52	7.30
Teens (13-19)	24	10.83	7.00
Male	7	14.29	7.54
Female	17	9.41	6.46
Children (6-12)	24	5.71	5.01
Male	17	6.00	4.94
Female	7	5.00	5.51
Under 19	48	8.27	6.55
Male	24	8.42	6.83
Female	24	8.13	6.42

However, there is only a very weak correlation between age and Habit across informants (r^2 = 0.4742), whereby there is only a 22% likelihood that the ability to describe life form increases with age. Evidently, age *per se* is not necessarily the factor that provokes the statistically significant results between age groups for the case of Habit. This lends support to my initial observation of the outlying informants in Figure 4.2.20, that they compose a mix of people who are most certainly not distinguished according to any age divisions. I speculate that these age groupings could actually represent a statistically significant division according to other factor/s that coincide with coming of age – perhaps time spent in the field, occupation, or domestic roles – which I shall return to later.

Naming: the gender effect

There is no significant gender effect in this task, whether for Naming (see Table 4.2.19) or Habit (see Table 4.2.20). T-tests on Males and Females across the sample and within age groups all produced results that were not statistically significant. This finding is the same as in the Specimen Id task.

Naming: the village effect

Table 4.2.21 shows the mean number of positive ids for Naming across village clusters. Kiau produced the highest number of positive ids (55%) followed by Melangkap (48%), and Monggis (47%). Analysis with t-tests revealed no statistically significant difference between clusters.

Table 4.2.21. Plant Id Task: Mean no of responses for naming according to village cluster

All (6-70 yrs)	No of informants	Mean no of positive ids	% of positive ids
Kiau	37	16.46	55%
Melangkap	35	14.37	48%
Monggis	40	14.03	47%

Results for the Adult sample only were isolated according to village cluster (see Table 4.2.22), which now shows a marked increase in the mean number of positive id scores across all clusters. As I have noted in the preceding discussion, all the high scorers are from the Adult age group. For the Adult sample, the Melangkap cluster produces the highest mean positive id score (73%), followed by Kiau (67%) and Monggis (58%). T-tests revealed the difference between Melangkap and Monggis to be statistically significant ($t = 0.001576914$; $p < 0.01$), in that Adults from Melangkap can indeed name more plants than their counterparts from Monggis.

Table 4.2.22. Plant Id Task: Mean no of responses for naming according to village cluster in Adults only

Adults (20-70 yrs)	No of informants	Mean no of positive ids	% of positive ids
Kiau	24	20.17	67%
Melangkap	15	21.87	73%
Monggis	25	17.36	58%
Adults (25-70 yrs)			
Kiau	18	22.33	74%
Melangkap	15	21.87	73%
Monggis	22	18.91	63%

There were no other statistically significant results in comparisons with the Kiau cluster. However, closer examination showed that all the Adults in the Melangkap sample were aged from 25 to 70 years. Thus in further analysis, I removed the outlying informants aged 20 to 24 years from the Kiau sample (6 informants) and Monggis sample (3 informants). The mean positive scores for naming in the Adult (25-70 years) sample are presented in Table 4.2.21. This time, Kiau produces the highest score (74%), followed by Melangkap (73%) and Monggis (63%). T-tests revealed no statistically significant difference between the Kiau and Melangkap clusters ($t = 0.733867599$; $P < 0.01$). There are however statistically significant differences between the Kiau and Monggis cluster ($t = 0.018769124$; $p < 0.05$), and between the Melangkap and Monggis cluster ($t = 0.007425695$; $p < 0.01$). In other words, informants over the age of 25 years in Kiau and Melangkap can name more plants than their counterparts from the Monggis cluster. This

corroborates the village effect among Adults in the Specimen Id Task: west side villages can name more taxa than east side villages.

Plant Id Task: use

The Use dataset comprises five components: (1) informants were asked to provide a use for each of the 30 plants, (2) name the parts of the plant used, (3) describe the method for preparing or using the plant, (4) recount the last time they used this plant in this way, and as a supplementary, informants were also asked (5) to provide a second use for each of the 30 plants[21] (see Figure 4.2.22). The Use response, or the ability of informants to describe a use for a plant, is contingent on whether the informant has correctly identified the plant in the Naming dataset. The Use response for a correctly named plant is accepted as a legitimate use for that plant. As contingency, these Use responses have also been checked against the PEK database and in interviews with other informants from the same village areas after testing had been completed. There were a small number of Use responses that were strongly dissimilar (e.g. a plant being attributed a food use when all other informants and references disagree that such a plant is edible), and as such, these responses have been excluded as legitimate uses. In the case of misrecognition, when the informant gives a wrong name for the plant, the Use response is not accepted as a legitimate use for that plant and the entire response (Use, Part used, Method, Recently used, Use2) is excluded from analysis. There are also cases where informants could not provide a name for a plant (e.g. they acknowledge they recognise the plant but cannot remember it's name), but were able to elaborate on its uses – these use responses were checked against the consensus of responses made by other informants, and in the event of a match with consensus, the response is accepted for inclusion in the analysis.

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[21] Mainly for reasons of time (i.e. = funding) and in fear of informant fatigue, I decided against obtaining an exhaustive list of all possible uses from informants (even though I did attempt exhaustive use lists with other informants during follow-up fieldwork after this sequence of testing). For that matter, I consider this to be a preliminary analysis and certainly encourage future attempts to examine exhaustive lists.

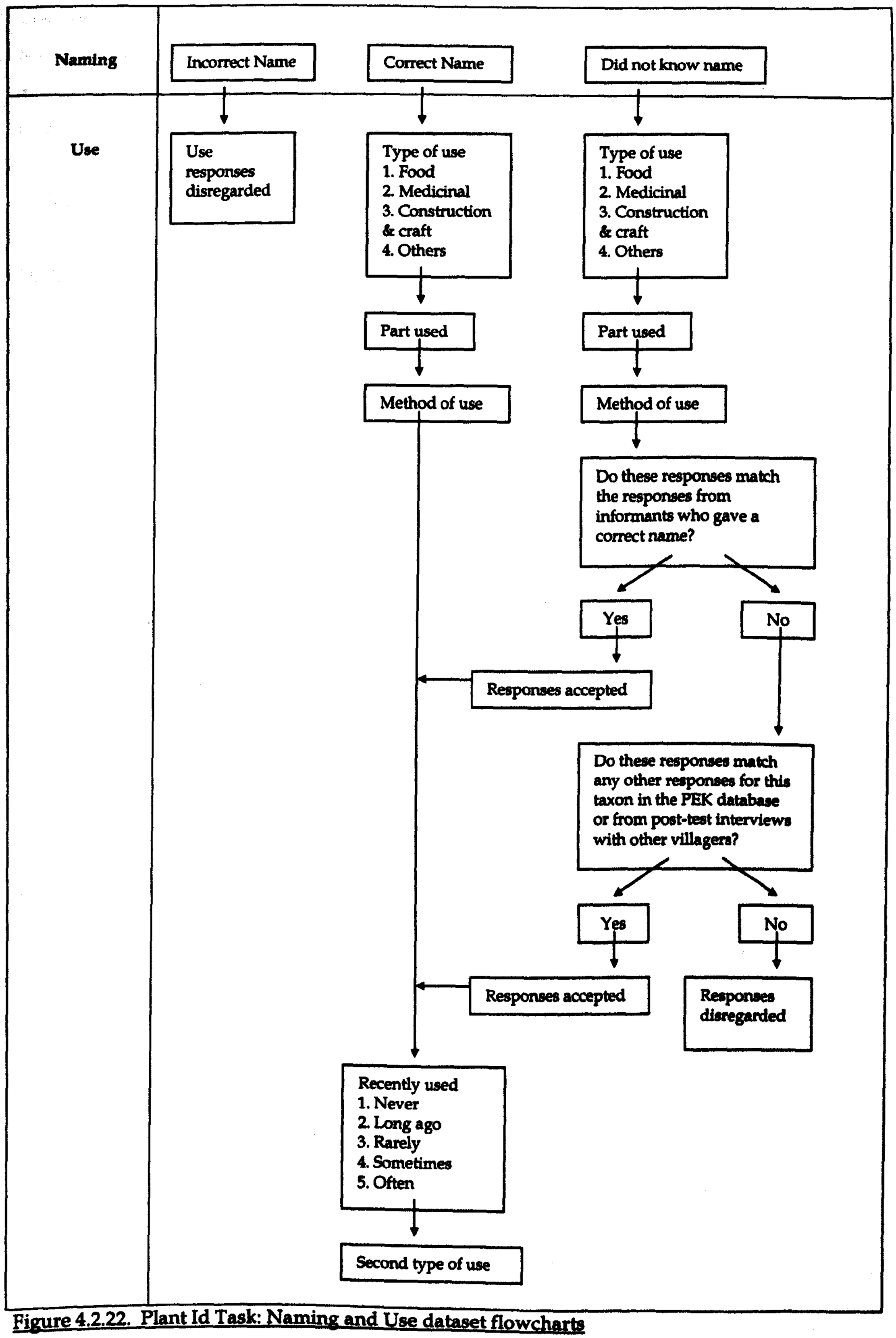

Figure 4.2.22. Plant Id Task: Naming and Use dataset flowcharts

Results by taxa

The Use responses according to taxa are presented in Table 4.2.23. The highest number of uses is for *tapayas kusai*, where 92% of informants are able to name a use for this plant. Of these 92%, 97% of them are able to name the part used and 90% of them are able to describe the method of using this plant. Taxa in the upper quadrant of Use responses are *tapayas kusai* (92%), *layo aragang* (90%), *pohuo* (88%), *rongguol* (80%), *sogumau* (78%), and *dalai* (72%). Taxa that scored in the lowest quadrant of Use responses, or taxa that the least number of informants could provide a use for, are *sampit-sampit* (9%), *kosup* (19%), *timbalung lanut* (20%), *rampah-rampah* (20%), *gunaton* (23%), and *tindalat-dalat* (25%).

Table 4.2.23. Plant Id Task: Use responses according to taxa

No	Dusun name[22]	Use	%	Part used	%	Meth.	%	Freq	%	2nd use	%
1	Rombisan	61	54	61	100	58	95	43	38	24	21
2	Timbalung Lanut	22	20	23	105	21	95	19	17	1	1
3	Binuang	44	39	43	98	33	75	19	17	11	10
4	Rongguol	90	80	87	97	80	89	63	56	30	27
5	Layo aragang	101	90	96	95	90	89	69	62	59	53
6	Kulung-kulung	51	46	51	100	50	98	32	29	19	17
7	Tubo	44	39	40	91	39	89	29	26	17	15
8	Lintagu	49	44	49	100	46	94	37	33	18	16
9	Morogison	43	38	40	93	37	86	24	21	2	2
10	Rampah-rampah	22	20	20	91	19	86	15	13	3	3
11	Torintid	38	34	40	105	39	103	30	27	12	11
12	Kosup	21	19	21	100	21	100	15	13	5	4
13	Tindalat-dalat	28	25	26	93	26	93	17	15	1	1
14	Kiri-kiri	63	56	61	97	60	95	46	41	2	2
15	Tapayas Kusai	103	92	100	97	93	90	72	64	57	51
16	Gunaton	26	23	26	100	23	88	18	16	9	8
17	Lias	61	54	60	98	53	87	37	33	26	23
18	Soronipon	43	38	43	100	43	100	27	24	3	3
19	Dokarok	74	66	73	99	63	85	56	50	16	14
20	Buntui	70	63	68	97	62	89	55	49	10	9
21	Pohuo	99	88	96	97	89	90	76	68	37	33
22	Sogumau	87	78	84	97	81	93	66	59	23	21
23	Gosing	77	69	76	99	71	92	51	46	28	25
24	Dalai	81	72	78	96	78	96	48	43	27	24
25	Tobu-tobu	43	38	44	102	44	102	33	29	5	4
26	Tali-tali	49	44	48	98	46	94	31	28	5	4
27	Togiung	57	51	56	98	48	84	40	36	14	13
28	Sampit-sampit	10	9	10	100	9	90	4	4	1	1
29	Rumun kilau	47	42	42	89	39	83	21	19	8	7
30	Tonsisilou	41	37	41	100	41	100	27	24	5	4
	Mean	**54.83**		**53.43**		**50.07**		**37.33**		**15.93**	
	Std deviation	**25.41**		**24.50**		**22.89**		**19.20**		**15.25**	

Above std deviation	
Below std deviation	

Note that taxa in the upper and lower quadrants in the Use dataset are also consistently placed in these quadrants in the Part and Method responses. Figure 4.2.23 presents these relationships in a clearer way. This pattern of consistency is confirmed by analysis with Pearson's product moment coefficient across all variables.

[22] See Table 4.2.7 for scientific names

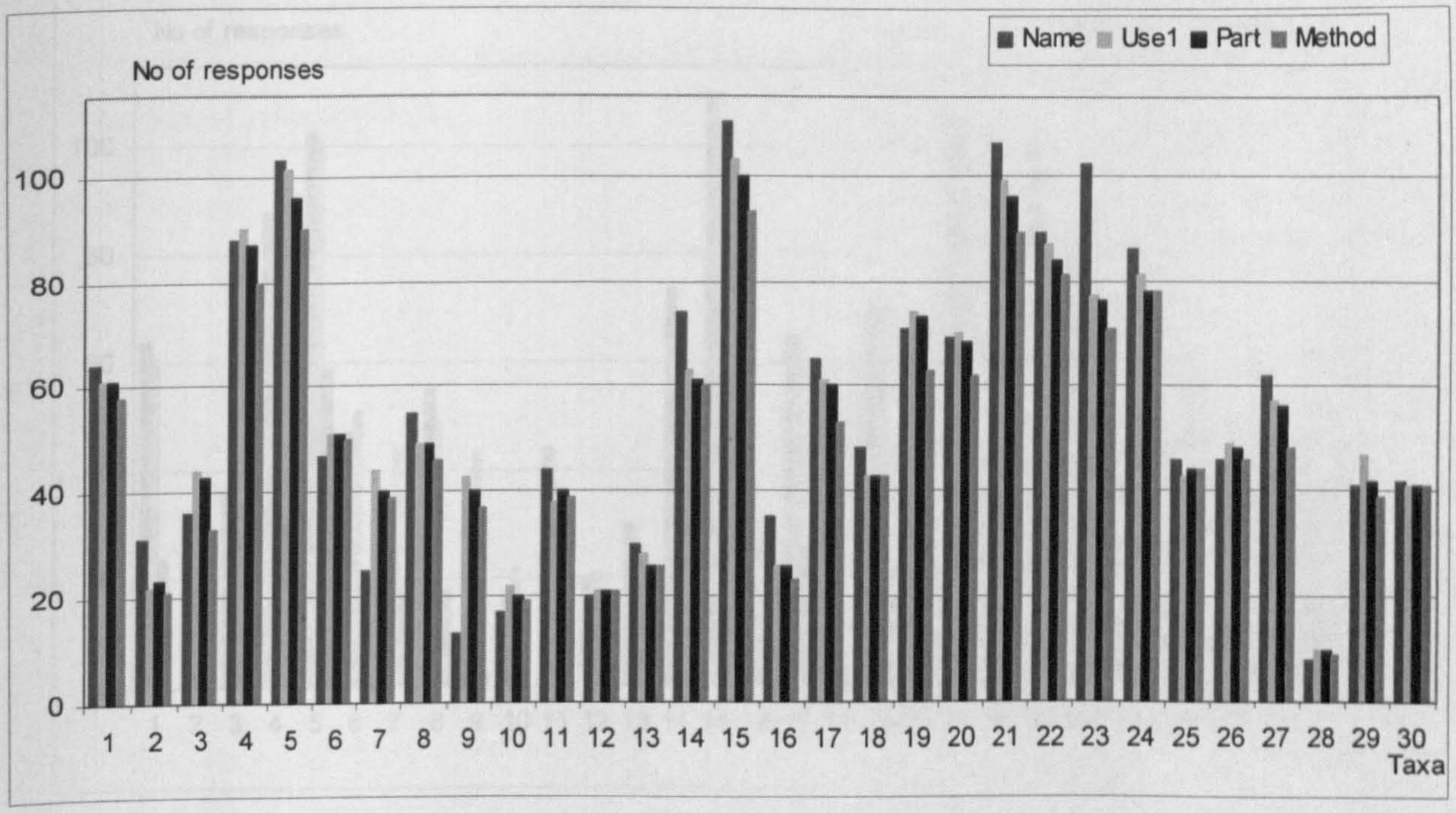

Figure 4.2.23. Plant Id Task: Naming and Use1 responses according to taxa

There is a strong correlation between Use1 and Part ($r^2 = 98$), such that there is a 98% likelihood that plants with a known use are plants that people know which parts of it to use. Additionally, there is a similarly strong correlation between Use1 and Method ($r^2 = 98$), such that there is 98% likelihood that plants with a known use are plants where people know how to go about using it. In other words, a plant whose uses are known by many people will also tend to be a plant that people know how to use and are using on a regular basis. In contrast, a plant whose uses are not known by many people, will also tend to be a plant that people are less familiar with in terms of how to use it, and evidently do not use it on any regular basis at all.

Figure 4.2.24 shows there is a strong correlation between Use1 and Use2 ($r^2 = 71$), such that there is 71% likelihood that a plant with one type of known use is also a plant that has other known uses (i.e. a second use). In other words, there is 71% likelihood that these plants have more than one kind of use value.

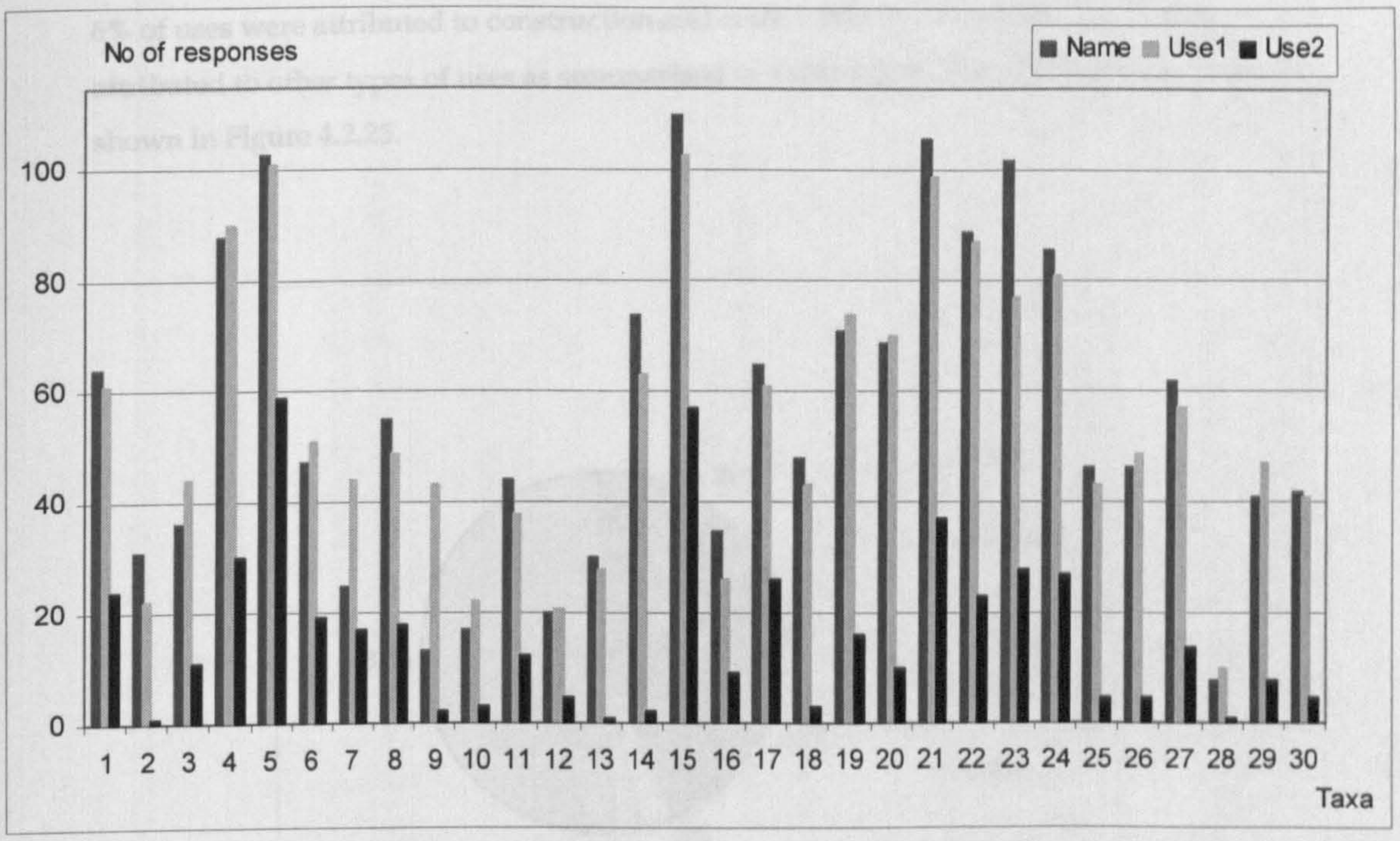

Figure 4.2.24. Plant Id Task: Naming and multiple uses according to taxa

There is also a strong correlation between Naming and Use1 ($r^2 = 90$), such that there is a 90% likelihood that a named plant is a plant whose use is known. This suggests a very strong link between Naming and Use – plants that can be named are almost always plants that have known uses and very likely have been used before. Plant uses are also described with a reasonable level of elaboration including a description of the parts used and method of preparation. The types of uses have been scored according to the categories shown in Table 4.2.24.

Table 4.2.24. Plant Id Task: Types of uses

	Type of use	Description
1	Food (41%)	Referring to use as vegetables, spices, fruits, and also as food and fodder for domesticated animals such as pigs and wild animals such as monkeys
2	Medicine (48%)	Referring to use as traditional medicinal treatments for a variety of diseases ranging from malaria, jaundice, diabetes, broken bones, sprains, insect bites, and post-natal treatments. The efficacy of these treatments has not been verified in any way by this research, and informants' knowledge of these treatments is taken as a matter of the faith and experience of informants.
3	Construction and craft (6%)	Referring to use as building materials such as wood, leaves for making roofing, fibres for making rope, as well as for handicrafts such as cloth, basketry, and beadwork.
4	Others (5%)	Referring to a range of uses including: fish poison, leaves as wrappers, ornamentals, cash crops, ground cover against erosion, firewood, and ritual.

It is worth noting that 48% of uses mentioned are medicinal uses followed by 41% for food. Only 6% of uses were attributed to construction and craft, while the remainder 5% of uses were attributed to other types of uses as summarised in Table 4.2.24. This distribution of uses is shown in Figure 4.2.25.

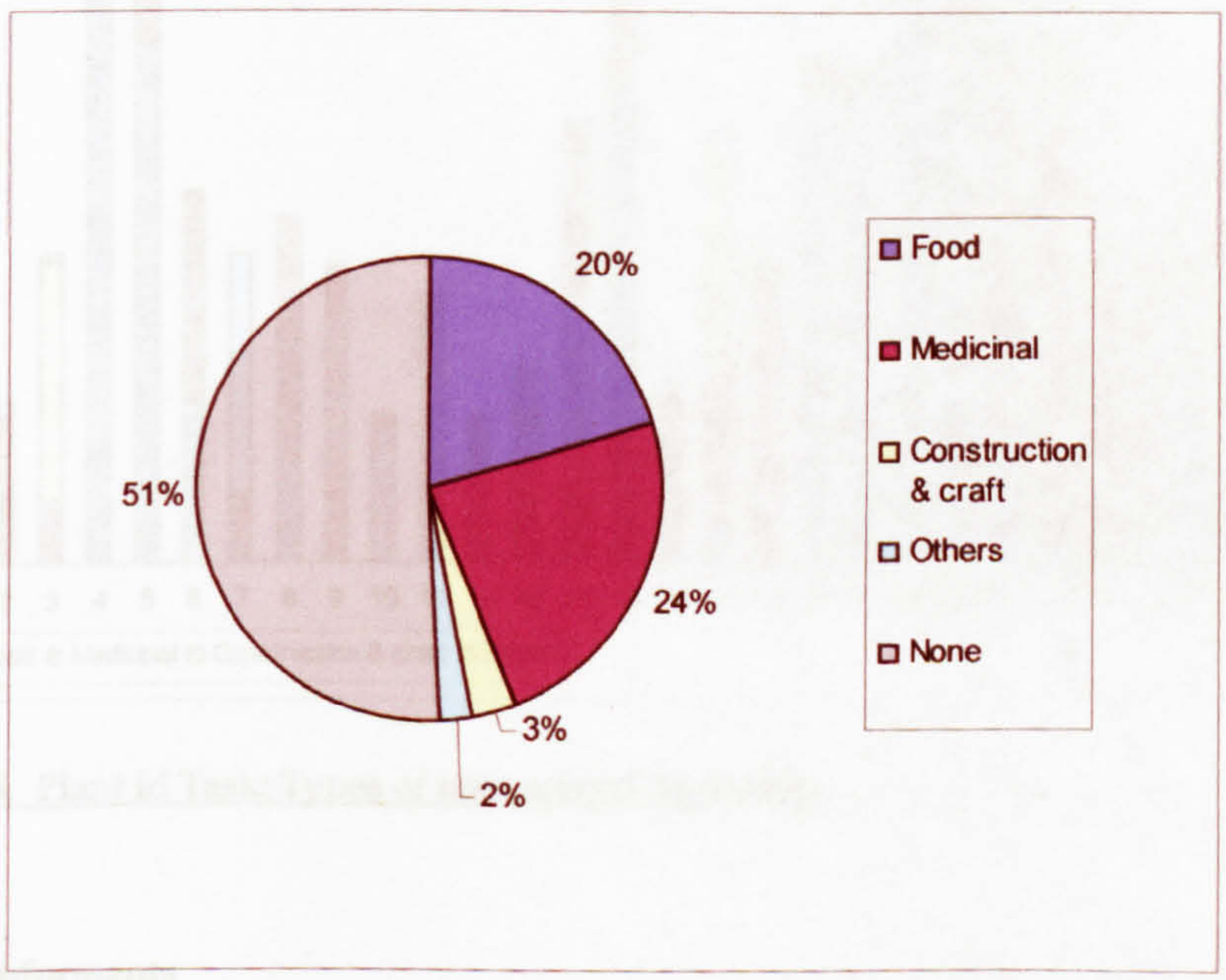

Figure 4.2.25. Plant Id Task: Types of uses

The scores for types of uses are displayed in Figure 4.2.26 for each taxon. Note the uses are scored out of 112 informants, whereby null responses have not been graphed. Interestingly, and as I had observed earlier in the Naming dataset, taxa in the upper quadrant of scores are plants used mainly for food (*layo aragang, rongguol, tapayas kusai, pohuo, sogumau*), in this case, the exception is *dalai* (commonly used for medicine or for bead making). While no single taxon was attributed purely as a food plant, there are six taxa that have been attributed a purely medicinal use (100%): *kosup, tindalat-dalat, tobu-tobu, sampit-sampit, rumun kilau* and *tonsisilou*, closely followed by *kiri-kiri* and *soronipon* (both attributed 98% medicinal use).

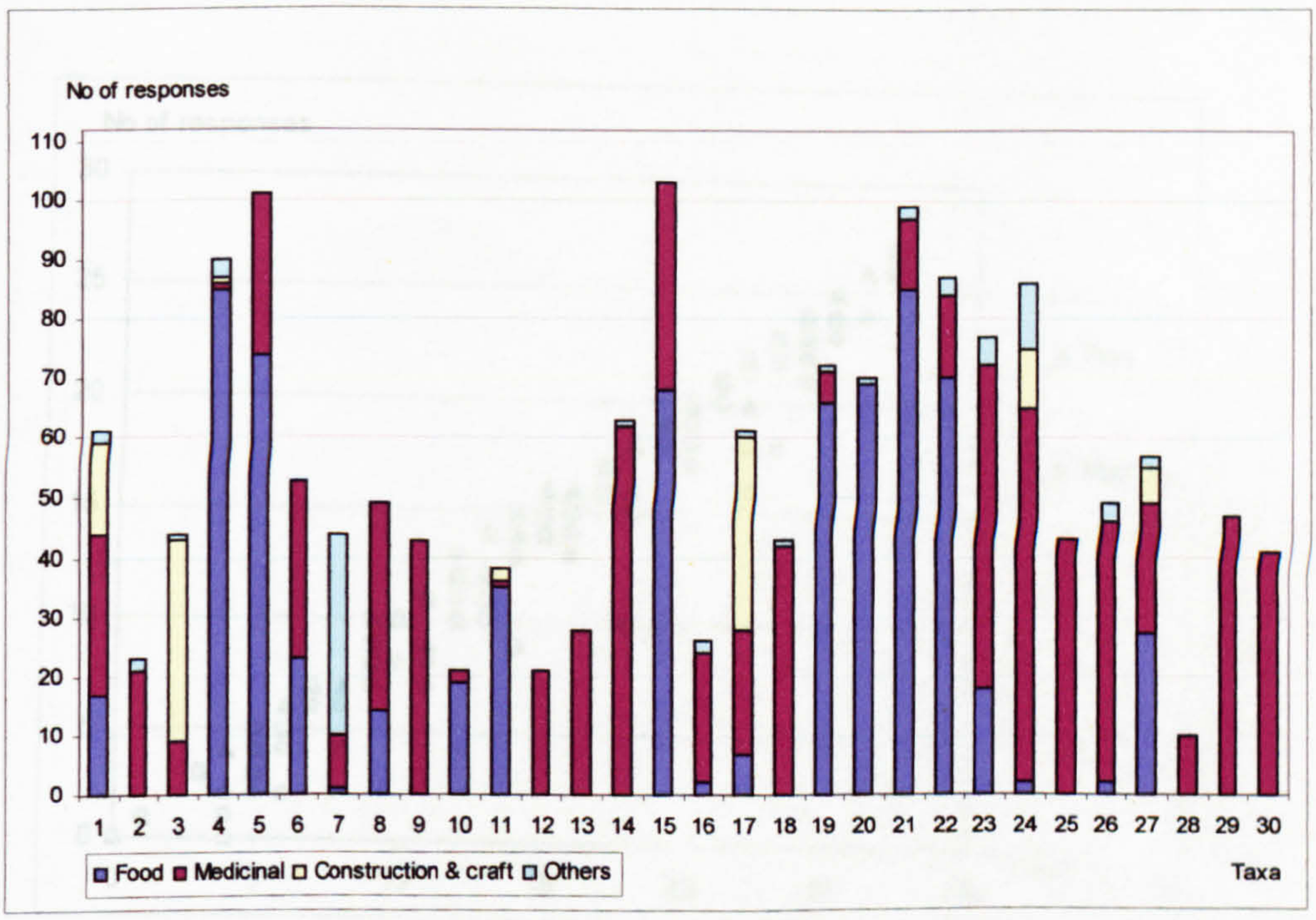

Figure 4.2.26. Plant Id Task: Types of uses according to taxa

Results by informants

Among informants, three adult males produced the highest number of uses, each being able to describe a correct use for 27 out of the 30 taxa. The upper quadrant comprises 30 informants who managed to describe the uses of more than 22 out of 30 taxa, all of whom are from the Adult category. Conversely, the lowest score is none out of 30 taxa, and there are 27 informants who managed to describe the uses of fewer than 7 out of the 30 taxa, thus forming the lowest quadrant of this distribution. With the exception of one informant, the remaining 26 informants in this lowest quadrant are from the Under 19 category. This pattern is consistent with the findings in the Naming dataset already discussed.

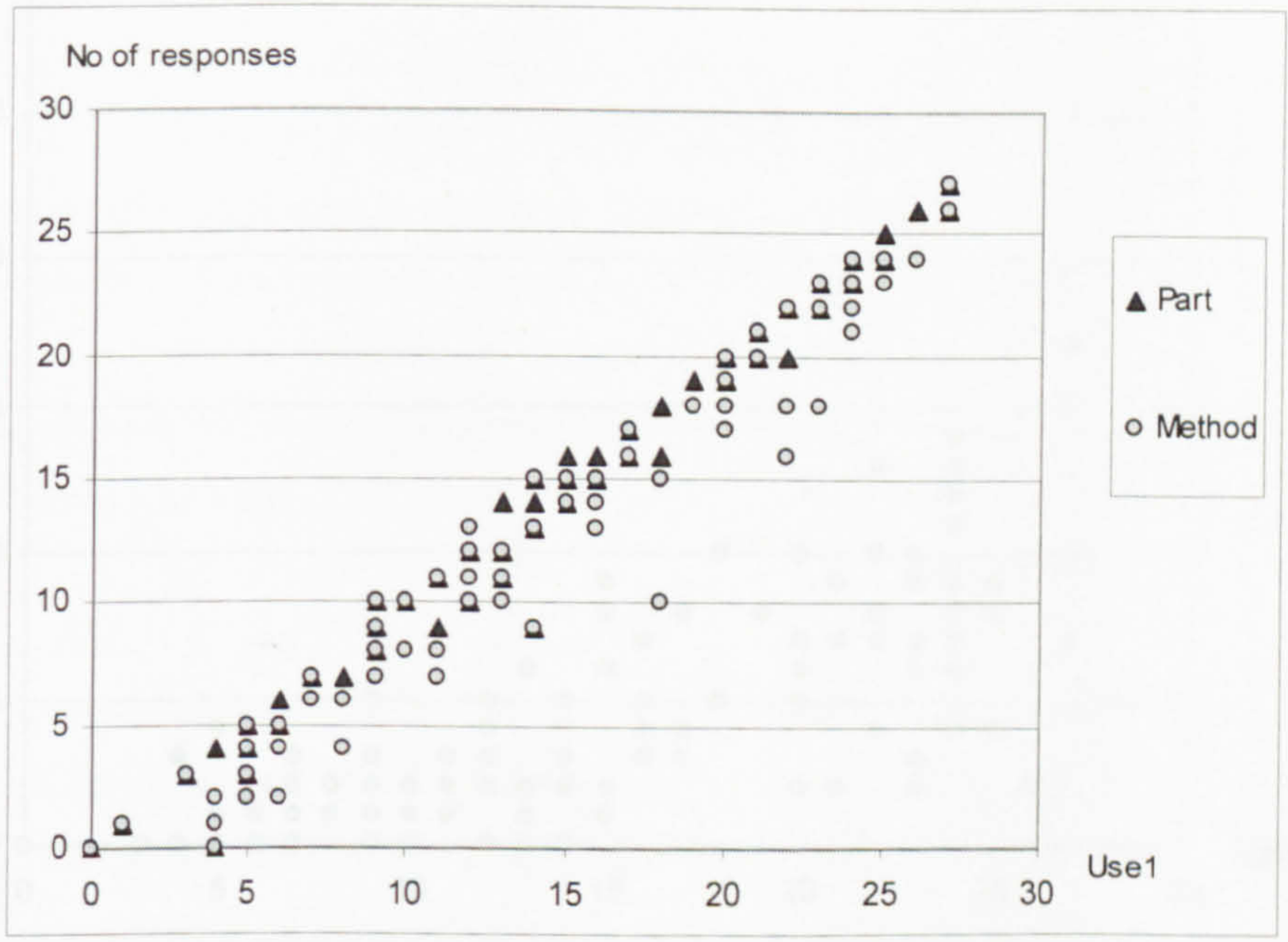

Figure 4.2.27. Plant Id Task: Relationship between Use1, Part and Method according to informants

Figure 4.2.27 shows a strong relationship between all the three Use, Part and Method distributions. Indeed, Pearson's product moment coefficient shows a strong correlation between Use1 and Part ($r^2 = 99$), or a 99% likelihood that informants who know the use of a plant will also know the parts of the plant that are used. Similarly, there is a strong correlation between Use1 and Method ($r^2 = 96$), or 96% likelihood that informants who know the use of the plant will also know the method of how to use it. This corroborates the Use results (shown in Figure 4.2.23) according to taxa.

There is also a reasonable correlation between Use1 and Use2 ($r^2 = 57$), or 57% likelihood that informants who know one use for a plant will also know a second use for the same plant, indicating that informants' knowledge of plant uses is reasonably elaborated (see Figure 4.2.28). This correlation according to informants coupled with the correlation according to taxa (described earlier) provides support for the idea that plants have multiple uses and that people are able to attribute multiple uses to plants.

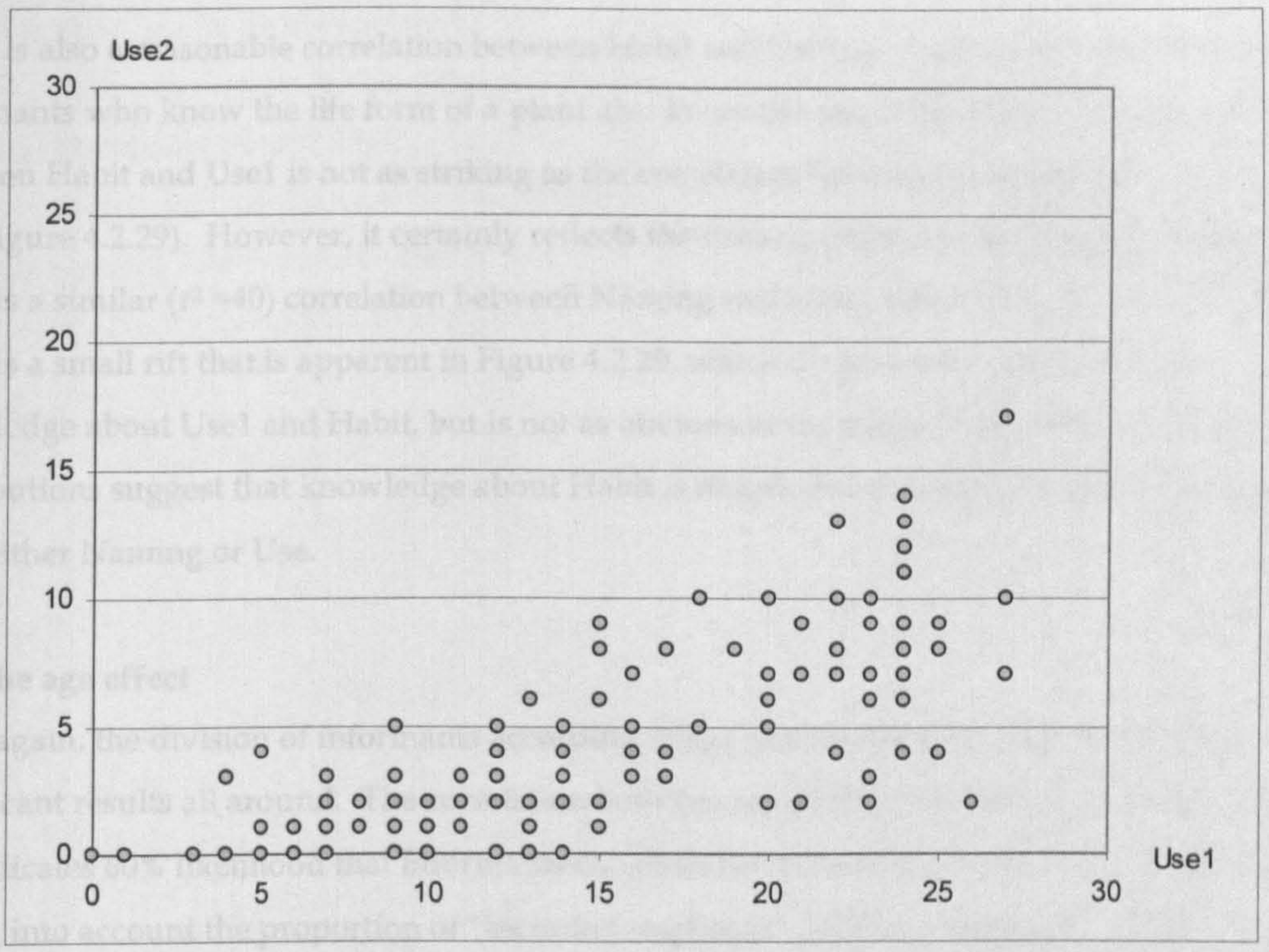

Figure 4.2.28. Plant Id Task: Relationship between Use1 and Use2 according to informants

There is a remarkable correlation between Naming and Use1 ($r^2 = 87$), or 87% likelihood that informants who know the name of the plant also know a correct use for the plant (see Figure 4.2.29). This corroborates the findings according to taxa where there is 90% likelihood that a named plant is also a plant whose uses are known.

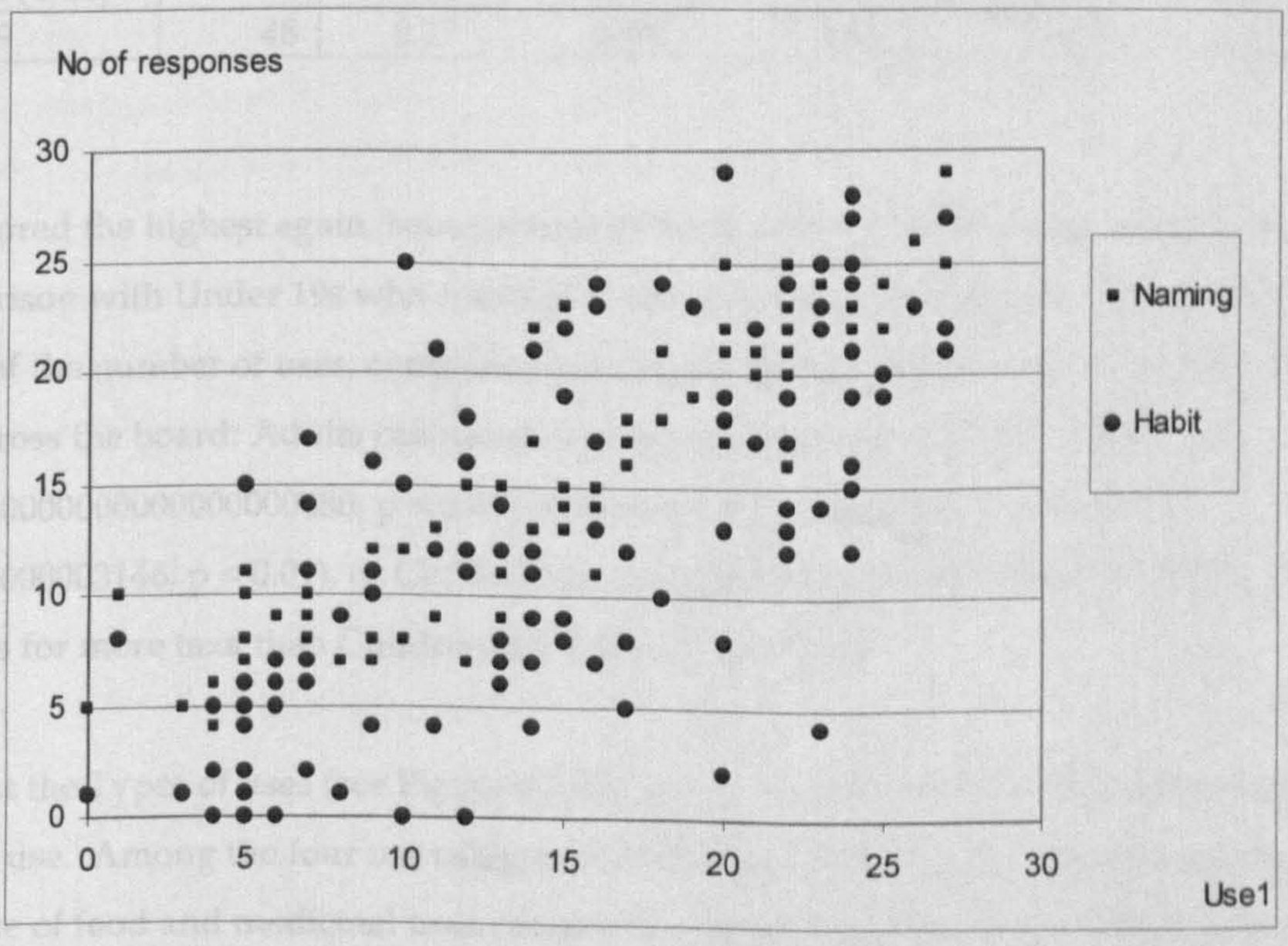

Figure 4.2.29. Plant Id Task: Relationship between Use1, Naming and Habit according to informants

There is also a reasonable correlation between Habit and Use1 ($r^2 = 49$), or 49% likelihood that informants who know the life form of a plant also know the use of the plant. The relationship between Habit and Use1 is not as striking as the correlation between Naming and Use1 ($r^2 = 87$) (see Figure 4.2.29). However, it certainly reflects the findings found in the Naming dataset where there is a similar ($r^2 = 40$) correlation between Naming and Habit (see Figure 4.2.20). Indeed, there is a small rift that is apparent in Figure 4.2.29, which divides informants who have knowledge about Use1 and Habit, but is not as obvious as the rift in Figure 4.2.20. These distributions suggest that knowledge about Habit is distributed according to different factors than either Naming or Use.

Use: the age effect

Once again, the division of informants according to age groups has produced statistically significant results all around. The correlation between age and the number of Use responses ($r^2 = 60$) indicates 60% likelihood that informants can describe more correct uses as age increases, taking into account the proportion of "incorrect responses" and "no responses". Table 4.2.25 shows the results of Use1, Types of use (as outlined in Table 4.2.24) according to age groups.

Table 4.2.25. Plant Id Task: Mean use responses according to age groups

Age	No of infmts	Use1	Type of use				
			Food	Medicinal	C & craft	Others	None
All (6 – 70)	112	14.69	6.12	7.06	0.89	0.66	15.27
Adults (20-70)	64	19.50	6.92	10.55	1.14	0.89	10.50
Teens (13-19)	24	9.92	5.38	3.29	0.79	0.54	20.00
Children (6-12)	24	6.63	4.71	1.54	0.33	0.17	23.25
Under 19	48	8.27	5.04	2.42	0.56	0.35	21.63

Adults scored the highest again, being able to provide uses for, on average, 20 out of the 30 taxa in comparison with Under 19s who could provide uses for, on average, about 8 out of the 30 taxa. In terms of the number of uses, comparisons between age groups yielded statistically significant results across the board: Adults can name uses for more taxa than Under 19s ($t = 0.000000000000000000000480$; $p < 0.01$), also more taxa than either Teens ($t = 0.000000000003146$; $p < 0.01$), or Children ($t = 0.00000000000000000001373$; $p < 0.01$). Teens can name uses for more taxa than Children ($t = 0.004771$; $p < 0.01$).

Looking at the Types of uses (see Figure 4.2.25), it is worthy to note that 51% of responses did not provide a use. Among the four use categories outlined in Table 4.2.24, there is a much greater dominance of food and medicinal uses compared with uses attributed to construction and craft and other miscellaneous kinds of activities. In the Adult sample however, the number of

medicinal uses is far higher than in the total sample or any other age group, which was found to be statistically significant (i.e. Adult medicinal uses vs. Under 19 medicinal uses: t = 0.00000000000000000001474; $p < 0.01$). Within groups t-test in the Adult category showed that there were significantly more medicinal uses than food uses ($t = 0.0000002631$; $p < 0.01$). It appears that Adults named more medicinal uses than any other kind of uses, as well as more medicinal uses than found in any other age group (see Figure 4.2.30).

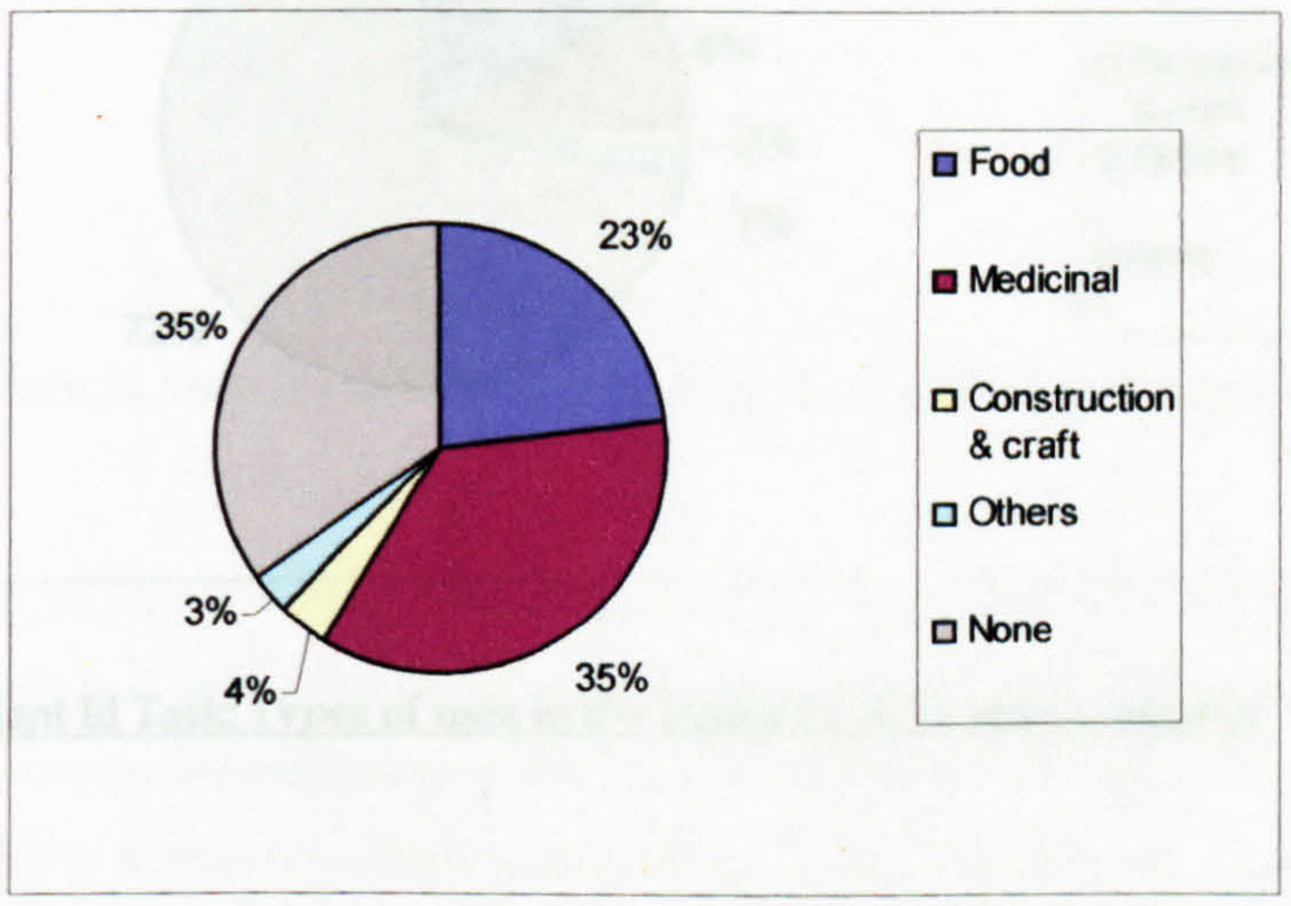

Figure 4.2.30. Plant Id Task: Types of uses in Adult (20-70 years) category

In contrast, the younger age groups named more food uses than medicinal uses (construction and craft and other uses were nominally mentioned). In the Under 19 category there are significantly more food uses than medicinal uses ($t = 0.0000009129$; $p < 0.01$), as in the Teens category ($t = 0.001206$; $p < 0.01$), and in the Children category ($t = 0.0002569$; $p < 0.01$). This is also shown in Figure 4.2.31, Figure 4.2.32 and Figure 4.2.33 respectively. As I mentioned, overall, Teens can name more uses than Children (specifically more medicinal uses than Children: t = 0.002635; $p < 0.01$; more construction and craft uses than Children: $t = 0.03127$; $p < 0.01$; more other uses than Children: $t = 0.04035$; $p < 0.01$), with the exception, interestingly, of food uses ($t = 0.3584$; $p > 0.05$). In other words, Teens are not able to produce more food uses as Children, even though Teens can name more medicinal and other uses than Children.

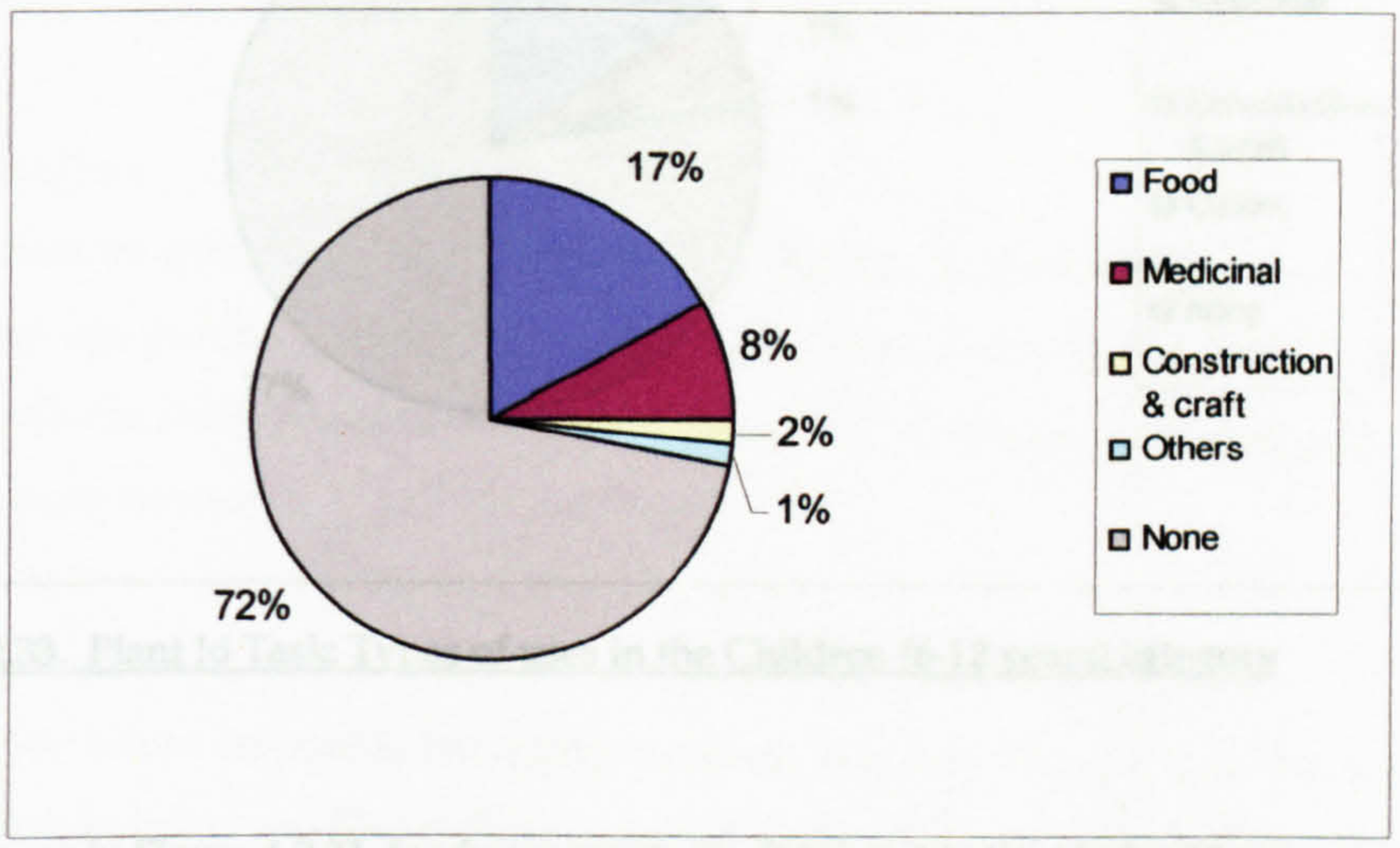

Figure 4.2.31. Plant Id Task: Types of uses in the Under 19 (6-19 years) category

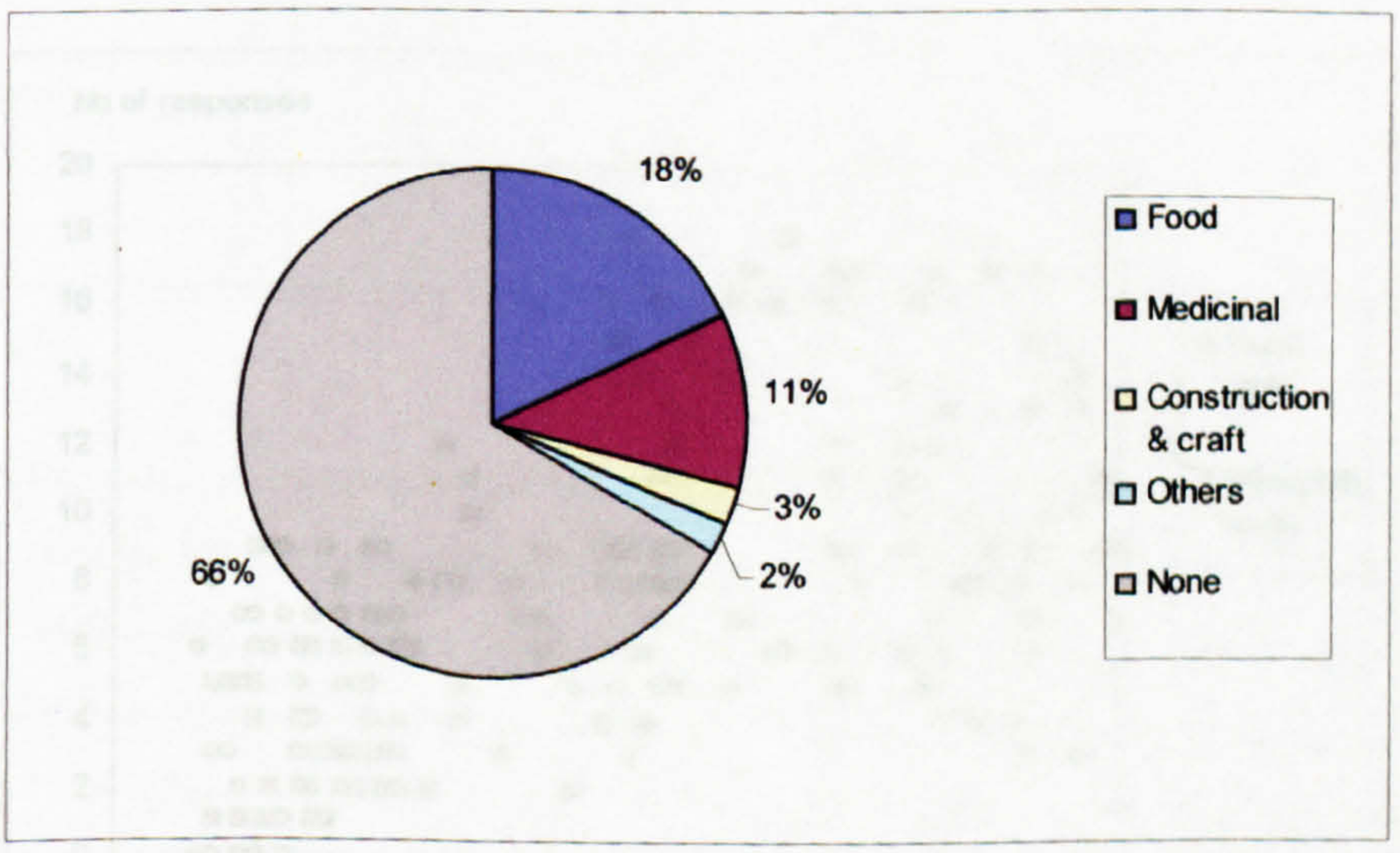

Figure 4.2.32. Plant Id Task: Types of uses in the Teens (13-19 years) category

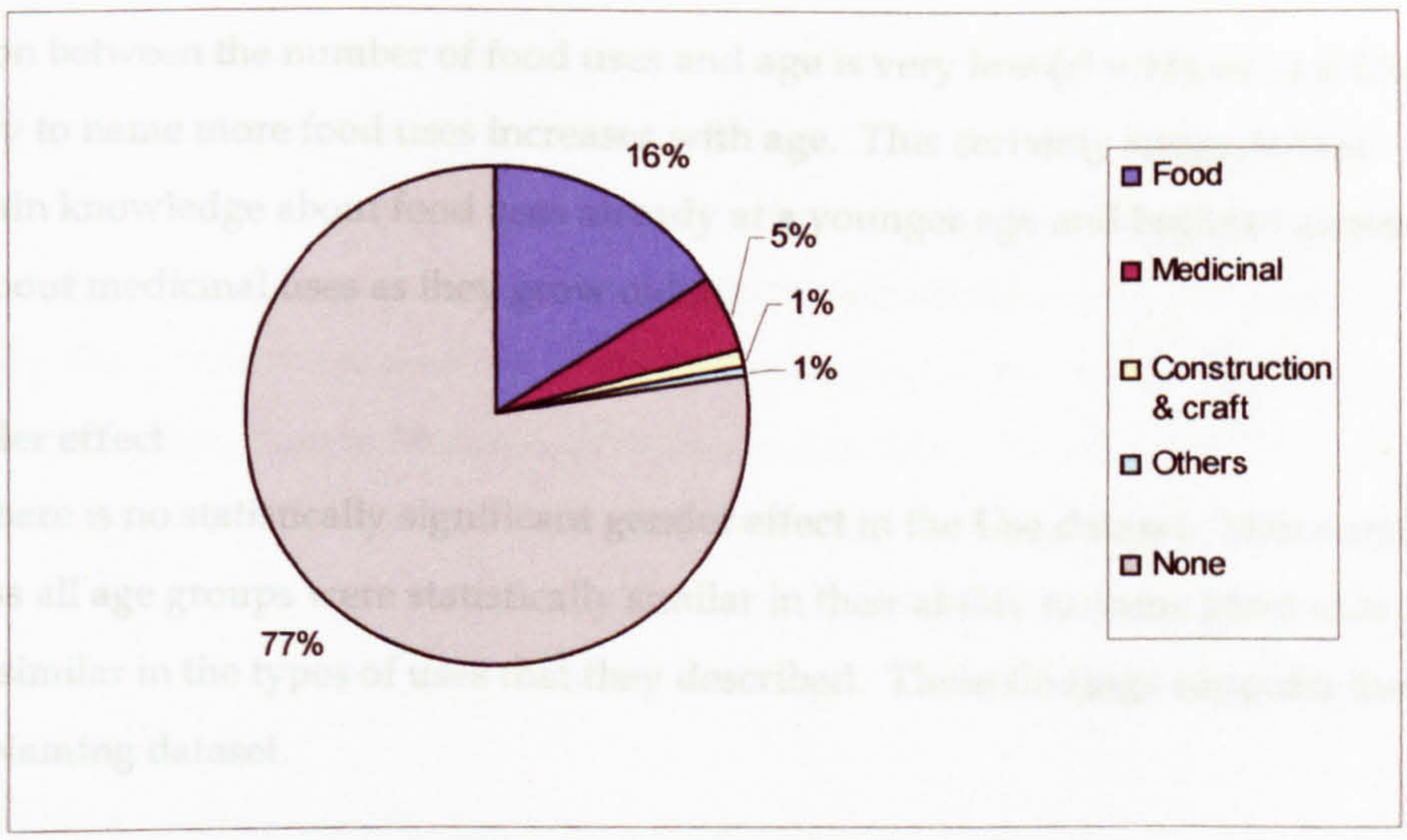

Figure 4.2.33. Plant Id Task: Types of uses in the Children (6-12 years) category

As we can see in Figure 4.2.31, food uses are more dominant in the Under 19 age group in general than medicinal uses, and a closer examination of raw data for Children shows that although these younger informants were able to say a plant had a medicinal use (e.g. *ubat*), they often were unable to elaborate on the type of medicinal treatment and how to go about using the plant in this way. There is indeed a correlation between the number of medicinal uses and age ($r^2 = 63$), such that there is 63% likelihood that the ability to correctly name more medicinal uses increases with age (see Figure 4.2.34).

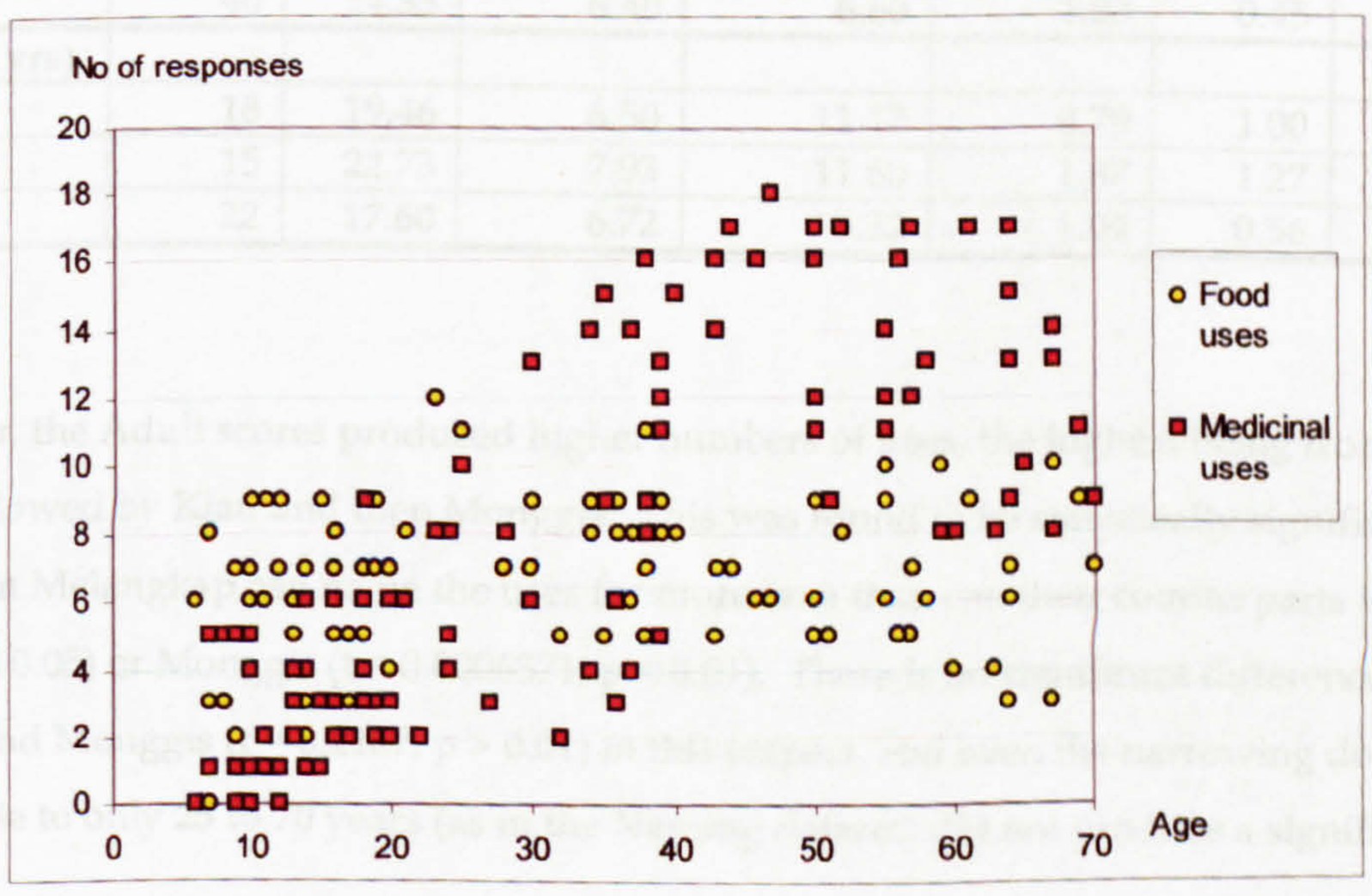

Figure 4.2.34. Plant Id Task: Relationship between Age, Food and Medicinal uses according to informants

The correlation between the number of food uses and age is very low ($r^2 = 11$), or 11% likelihood that the ability to name more food uses increases with age. This certainly suggests that informants gain knowledge about food uses already at a younger age and begin to accumulate knowledge about medicinal uses as they grow older.

Use: the gender effect

Once again, there is no statistically significant gender effect in the Use dataset. Males and Females across all age groups were statistically similar in their ability to name plant uses, and were equally similar in the types of uses that they described. These findings supports the results found in the Naming dataset.

Use: the village effect

Table 4.2.26 shows the use responses according to village clusters. There are no statistically significant differences between village clusters for the total sample. This prompted a closer examination of only the Adult category according to village clusters, also shown in Table 4.2.26.

Table 4.2.26. Plant Id Task: Mean use scores according to village clusters

All	No of infmts	Use1	Type of use				
			Food	Medicinal	C & craft	Others	None
Kiau	37	15.65	6.08	8.03	0.68	0.81	14.41
Melangkap	35	14.09	5.83	6.57	0.97	0.74	15.89
Monggis	40	14.33	6.40	6.60	1.03	0.45	15.53
Adults (20-70 yrs)							
Kiau	18	19.46	6.50	11.17	0.79	1.00	10.54
Melangkap	15	22.73	7.93	11.60	1.87	1.27	7.33
Monggis	22	17.60	6.72	9.32	1.04	0.56	12.36

As noted earlier, the Adult scores produced higher numbers of uses, the highest being from Melangkap, followed by Kiau and then Monggis. This was found to be statistically significant, in that Adults from Melangkap can name the uses for more taxa than can their counterparts in Kiau ($t = 0.03123$; $p < 0.05$) or Monggis ($t = 0.0006371$; $p < 0.01$). There is no significant difference between Kiau and Monggis ($t = 0.2167$; $p > 0.01$) in this respect, and even the narrowing down of the Adult sample to only 25 to 70 years (as in the Naming dataset) did not produce a significant result.

In terms of the type of uses, there is no statistically significant difference between village clusters for the total sample. No single village cluster mentioned one type of use more often than others. A closer look at the Adult sample according to village clusters reveals that, as noted earlier,

medicinal uses are mentioned more than any other kind of use within a cluster, but there are no significant differences between Adults of different village clusters.

This is a rather crucial finding: as far as Naming is concerned, adults from Kiau and Melangkap can consistently name more taxa, whether in the natural setting or as voucher specimens, compared to their counterparts in Monggis over on the east side of Kinabalu. When it concerns Use however, adults from Kiau are not able to describe as many correct uses as Melangkap adults

Plant Id Task: recently used

Recently used refers to when was the last time informants used a plant in the way they have described it. Looking at it from the point of taxa (see Table 4.2.23), there is a clear pattern that taxa in the upper quadrant of Naming and Use scores are also plants in the upper quadrant of the Recently used scores. There is a strong correlation between Naming and Recently used (r^2 = 89), such that there is a 89% likelihood that a named plant has been used before. Similarly, the strong correlation between Use1 and Recently used (r^2 = 94) suggests a 94% likelihood that a plant whose uses are known is a plant that has been used before. These distributions are shown in Figure 4.2.35.

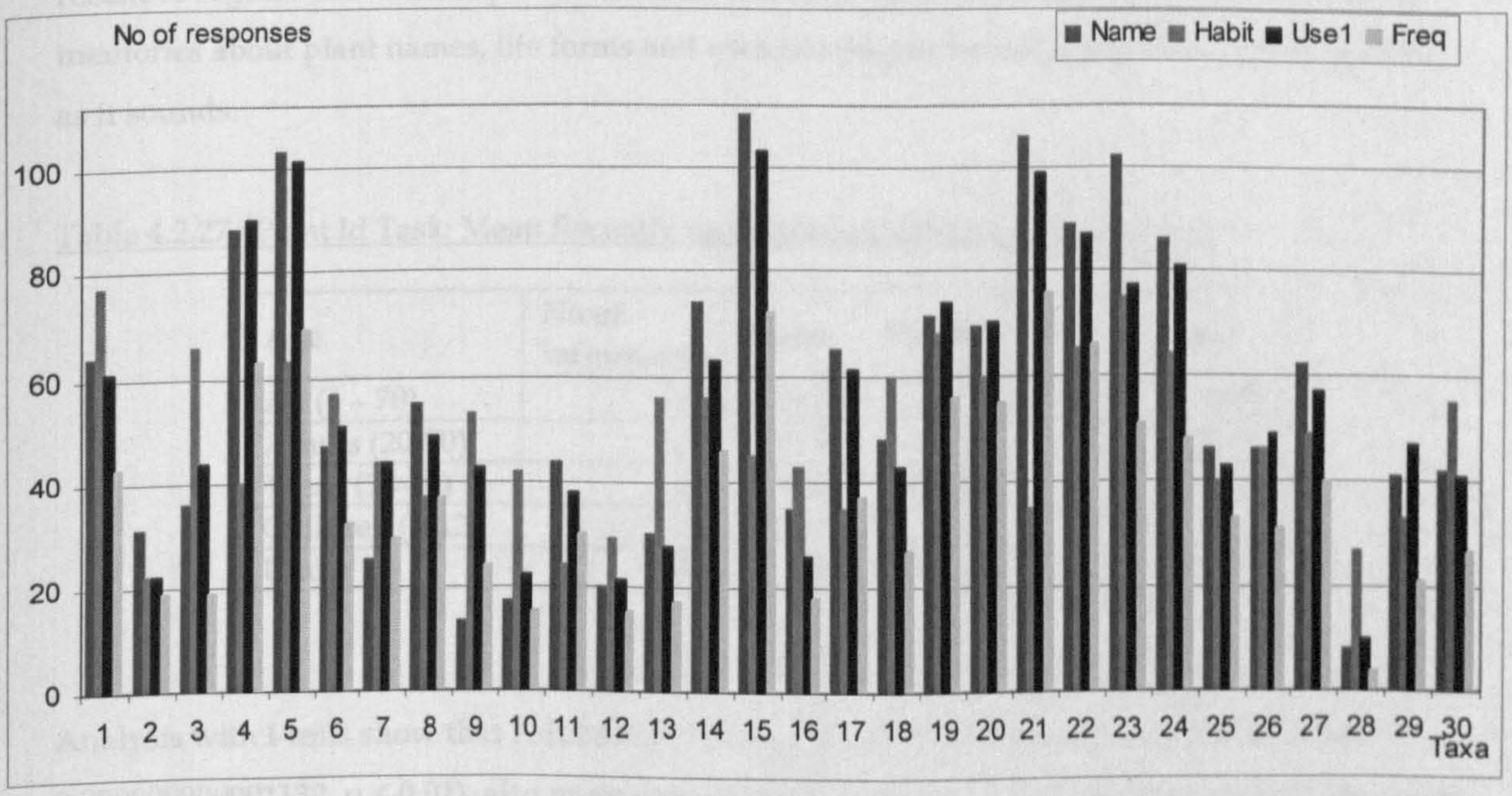

Figure 4.2.35. Plant Id Task: Relationship between Naming, Habit, Use1 and Recently used (Freq) for each taxa

What is perhaps interesting is the absolute difference between the Naming scores and the Recently used scores, and between the Use1 scores and the Recently used scores. While there is a

strong tendency for plants whose names and uses are known to also be plants that have been used before, there is a marked reduction in the number of times these plants have been used. For example, *tapayas kusai* was named, on average, by 98% of informants and its uses were described by 92% of informants, but only 64% of informants had actually used it for their stated purpose. The low Recently used scores resonate throughout the listing in Table 4.2.22, suggesting that actual plant use is substantially lower than could be inferred from the high Naming and Use scores.

The Habit distribution is also interesting – there is only a very weak correlation between Habit and Recently used ($r^2 = 13$), or 13% likelihood that a recently used plant is also a plant whose life form is known or agreed upon. Certainly, there remain unaffiliated taxa such as *pohuo* and *tapayas*, which are the most recently used plants, whose life form remain a murky determination. In other words, having recently used a plant does not necessarily mean a person is able to determine the life form of such a plant.

Among informants, the case is not very different. Table 4.2.27 shows the mean Naming, Habit, Use1 and Recently used scores according to informants. The Recently used scores are the lowest of all four variables, indicating that talking about plants fluently is by no means matched by any recent or regular use of these plants. In other words, people still retain cogent and elaborated memories about plant names, life forms and uses but people are not using these plants as often as it sounds.

Table 4.2.27. Plant Id Task: Mean Recently used scores according to age groups

Age	No of informants	Name	Habit	Use1	Freq
All (6 – 70)	112	14.94	12.71	14.69	9.98
Adults (20-70)	64	19.47	16.05	19.50	13.55
Teens (13-19)	24	10.04	10.83	9.92	6.75
Children (6-12)	24	7.75	5.71	6.63	3.71
Under 19	48	8.90	8.27	8.27	5.23

Analysis with t-tests show that Adults report using plants more recently than Under 19s ($t = 0.000000000001132$; $p < 0.01$), also more recently than Teens ($t = 0.0000003145$; $p < 0.01$), and more recently than Children ($t = 0.0000000000001346$; $p < 0.01$). Teens reported using plants more recently than Children ($t = 0.008321$; $p < 0.01$). Interestingly, the correlation between age and Recently used is not as clear as expected ($r^2 = 30$), such that only 30% of the variance in Recently used is accounted for by age. Thus the likelihood of using plants more recently or frequently

does not necessarily increase with age, and certainly, I contend there are other factors that come into play.

There is a reasonable correlation between Naming and Recently used ($r^2 = 55$), or 55% likelihood that informants who know their plant names will have also reported having used them on a regular basis. Similarly, there is a stronger correlation between Use1 and Recently used ($r^2 = 65$), or 65% likelihood that informants who know the use of a plant tend to be informants who have most recently used this particular plant in the way they have described it (see Figure 4.2.36).

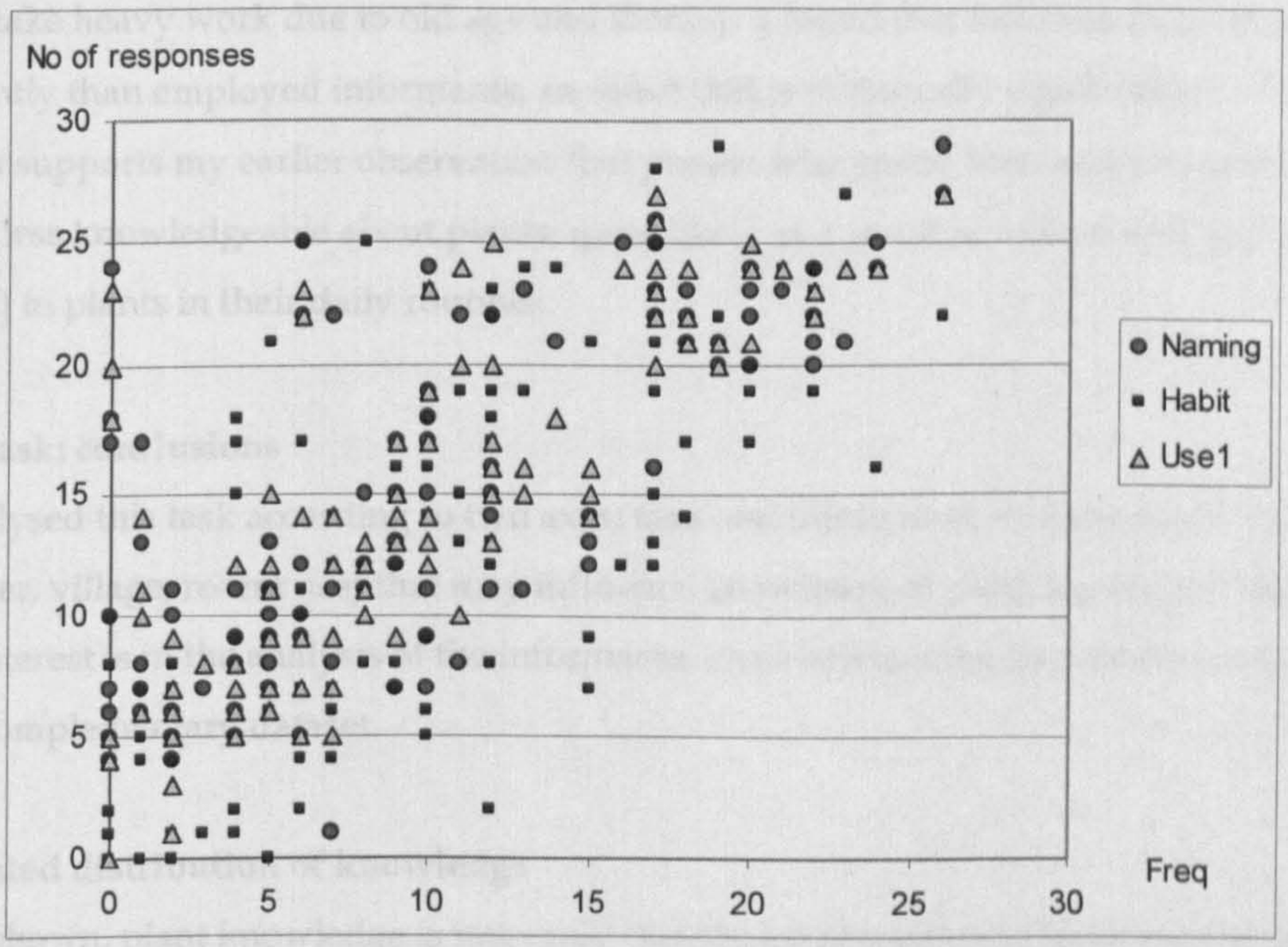

Figure 4.2.36. Plant Id Task: Relationship between Recently used (Freq) and Naming, Habit and Use scores for all informants

Much like the trend according to taxa that I pointed out in Table 4.2.22, the results according to informants in Table 4.2.27 show overall lower Recently used scores compared with Naming and Use scores. For example, the Adult sample has a mean Naming score (65%) similar to the mean Use score (65%), but the Recently used score is markedly lower (45%). So while adults are able to describe the names and uses of plants, they are not really using these plants as often as it may seem. The difference between Recently used scores and Use scores certainly suggests that there are informants with detailed knowledge about plant names and uses who are not putting this knowledge to use on a regular basis (or not at all).

There is a reasonable correlation between Habit and Recently used ($r^2 = 56$), or 56% likelihood that informants who know the life form of a plant tend to be informants who use this plant most

recently. This is interesting because the correlation between Habit and Recently used according to taxa is so low, while the correlation between Habit and Recently used according to informants is reasonably strong. It suggests that people do learn the life form of the plant through regular use, just as people use a plant regularly when they know the life form. However, it also suggests that for some plants (e.g. *pohuo, tapayas*) the determination of life form remains problematic irrespective of how frequently they are being used.

Finally, I divided the Adult sample according to occupation: 67% are full-time farmers, 25% are employed (engaged in some form of wage labour either full or part time), and 8% are invalid (do not undertake heavy work due to old age and illness). I found that full-time farmers use plants more recently than employed informants, an effect that is statistically significant ($t = 0.03189$; $p < 0.01$). This supports my earlier observation that people who spend time away from the village tend to be less knowledgeable about plants, quite likely as a result of a decreased exposure (or none at all) to plants in their daily routines.

Plant Id Task: conclusions

I have analysed this task according to two axes: taxa and informants, looking at several variables (age, gender, village, recent use) that may influence knowledge of plant names and uses. My primary interest is in the analysis of the informants, cross-referencing the results according to taxa as a complementary dataset.

A fragmented distribution of knowledge

As I have shown, plant knowledge is unevenly distributed throughout the sample of informants. Based on the above analysis, I have isolated two factors for this finding: age and recent use, both of which are not closely correlated with each other. Both age and recent use however, have the same kind of effect of increasing knowledge of plant names and plant uses when informants are older and when they have recently used a plant. Age favours adults as having a more elaborated knowledge of plant names and uses in comparison with young people. In terms of the types of uses, adults tend to describe more medicinal uses while young people tend to focus more on food uses. Additionally, people who use plants more recently also have a more elaborated knowledge of plant names and uses.

This is however, not the case with life form descriptions: age and recently used do not have the same effect. People who can describe life form tend to be people who use plants regularly, indicating the elaboration of knowledge about life form can be increased with frequent exposure to plant use. The relationship between age and life form is very loose, such that knowledge

about life form is not necessarily something that develops as the default consequence of growing older.

Different skills in knowledge

As discussed earlier, knowledge of plant names and plant uses are very closely related, whereas neither names nor uses are closely related to knowledge about life forms. I contend these findings lend strong support to the argument that there are different domains (or sub-domains) to plant knowledge. The morphological sub-domain operates on the proposition that the life form is a feature intrinsic to the plant, in that it is a characteristic that is in the nature (i.e. morphology) of the plant itself and is not part of the utilitarian domain of the plant. If the life form of the plant is, in and of itself, difficult to determine (let's say it is an unaffiliated taxon), then no amount of increased use is going to change the nature of its life form characteristics.

On the other hand, plant knowledge can also exist in the utilitarian sub-domain (in this sense referring to the behaviour of the Naming and Use distributions in comparison with the Habit distribution). Thus regular exposure to, and use of, plants can increase a person's familiarity with the plant, perhaps by providing more cognitive cues for remembering names, uses, and discerning life forms. So while the intrinsic nature (i.e. morphology) of the plant cannot be changed, the ability or skill of a person to discern the life form can be increased with increased plant usage to an advanced stage where even problematic life forms of unaffiliated taxa can be discerned.

A simpler way of saying this is that there are different skills involved in plant knowledge. Remembering plant names is one kind of skill, and remembering plant uses is another, albeit closely related, skill. Discerning life forms is yet another skill – one that is constrained by the intrinsic nature of the plant (i.e. morphology), but a person's ability to develop this skill can be increased, to some degree, by using plants on a regular basis. In this view, knowledge is elaborated through a process of positive reinforcement, that is, associating features of plants (i.e. names, life forms, uses) with the actual plant by virtue of regular practice.

4.2.3.2. Overall conclusions

These results tell us that a Dusun villager in Kiau, aged between 20 and 70 years, can have an impressive reservoir of plant knowledge. He can fluently list about 30 to 40 plants of various types and uses. He will quite likely be able to name the majority of plants he sees in his local habitat, especially if those plants have a use value to him. He can point to a young shrub and tell me if the plant is a kind of *wakau*, or a *kayu*, or a *sakot*, and which other plants are "related" to it. He will be able to describe the use of these plants in some detail, particularly the parts of the

plant used and how to go about using it. There is a good chance that he will also know additional uses for these plants. Very likely, his wife will also have a comparable amount of plant knowledge, although she will be more inclined towards plants with food uses. Over on the other side of the hill, his elder sister and her husband also share this reservoir of plant knowledge as much as they share their routine of daily chores and weekly church gatherings. Looking closer, we find their routine involves an equally impressive degree of plant use, whether in harvesting vegetables, mending the *atap* roofs of their family *sulap*, or rubbing *layo* root poultice on an aggravated mosquito bite.

These results also tell us this plant knowledge is a reservoir shared by potentially all the Dusun communities around Kinabalu, even though certain plants are more commonly used in certain villages. This reservoir of plant knowledge includes information about a vast number of plants and their uses, but is by no means distributed evenly throughout the whole village. In fact, our knowledgeable Dusun friend, his wife, his sister and brother-in-law, represent only a very small portion of the village.

The status of plant knowledge is therefore, fragmented. Obviously, plant knowledge is not a given body of knowledge that people are born into by default – some people have lots of it while others don't. People gain knowledge as part of growing up, and as they grow older their vocabulary of plant names and uses becomes bigger, broader and increasingly diverse. As they grow older however, they face a number of factors that frame their predisposition towards the plant world – these I have termed the *eye of the beholder* factors, which I address as the amount of time spent interacting with plants. We have seen in the Free Listing task how young people exhibit a potentially vast vocabulary of plant names whose breadth, even at a young age, is akin to those of adult vocabularies. It represents theoretical knowledge, not quite securely grounded in practical experience – so children can name many plants off the top of their heads but at the same time have difficulties in identifying the plant when they confront the actual organism. It is perhaps, an early stage of gaining plant knowledge; starting first with plants they have more contact with – food plants. As these children grow older, they may have to go away to boarding school and tertiary institutions, get jobs, or live away from the village, all of which are factors that diminish their contact with the plant world. If they continue to lose touch with the local habitat, plant usage and the people who are engaged in the sharing of this knowledge, then their plant knowledge is not given a conducive environment to flourish.[23] We can already see this effect in people who are engaged in wage labour, and therefore spend less time farming, whose usage of plants is much less than their counterparts who are full-time farmers. Also, people who

[23] In about ten years' time, a substantial number of people who have finished tertiary education would be in their early thirties – it would be interesting to examine the status of their plant knowledge in relation to their counterparts who have not left the village in this period.

share the same local habitat tend to share a similar vocabulary of plant names – evidently, contact with the local habitat plays a role in allowing knowledge about plants growing therein to develop in people who access these areas. Conversely, people who already live away from the village do not have such an extensive knowledge of plant names and uses.

In this way, we can also see how plants themselves are predisposed to factors that can enable or limit people's knowledge – some plants are very well known while others are not. These are what I call *domain of thought* factors because they frame the terms of reference for how the plant world is conceptualised. The same plant can be conceptualised in terms of different characteristics depending on the contextual framework. We have seen how the Naming distribution behaves differently to the Habit distribution – talking about plants in terms of names or life forms are different contexts for framing the discussion. Evidently, some people can know the name of a plant but not know its life form category. Another contextual framework is if we examine the same plant as a voucher specimen or in the natural setting, and again, we find people react differently in each setting. Plants can also be contextualised in terms of their accessibility – people know more about plants that are available to them – those growing in their local habitat and those that are used regularly. Children interact more with food plants, especially fruits, but have little experience with medicinal plants. Adults, on the other hand, have more diverse roles that tap into a variety of plant uses and thus have a more diversified knowledge of plants. Medicinal plants dominate the adult responses here, but I contend this is more an effect of the stimulus whereby the test thirty plants were selected on the basis of the Plant Manual exercise (where all the plants mentioned by villagers are medicinal plants). It nonetheless shows that children know about plant uses according to the uses that are most accessible to them – children can talk fluently about the food properties of a plant but do not know much about the medicinal properties of the same plant.

This raises the final point about the fragmented distribution of plant knowledge – the *principle of fit*, which is how plant knowledge must fit within the context of reality. The example of life form illustrates this point – people generally have difficulties describing the life form of unaffiliated taxa because these taxa do not fit within the available spectrum of Dusun morphological classifications. What can happen is people invent classifications so that these unaffiliated taxa can be described. Even so, these invented classifications are not fantastical; rather they fit within the practical reality of how that person sees the unaffiliated taxa (e.g. as a domesticated plant, as a fruit, or like a bamboo). Faced with the discomfort of an unaffiliated taxon, people can reach into their reservoir of plant knowledge and apply a label that describes how that taxon fits into their reality.

At the same time, people have access to plant knowledge as befitting the circumstances of their normative reality. People who interact regularly with the plant world have a routine that reinforces their plant knowledge. Thus children cannot be expected to know about medicinal plants if their normative reality does not involve exposure to this way of using plants. Similarly, children may be able to produce a formidable list of plant names but reinforcing this knowledge involves grounding children in the practical reality of regular plant use, whether food, medicinal or otherwise. Nevertheless, knowledge of plant names and uses can exist in people who do not, or no longer, use plants regularly. This represents, to some degree, remembered or theoretical knowledge. On the one hand this describes a kind of normative reality where there is less opportunity to put plant knowledge to practical use. On the other hand, it raises the issues of whether this knowledge will survive as theoretical rather than enacted or practical knowledge, and how people are going to ensure the continuity of traditional plant knowledge in a theoretical form.

4.2.4. Part Three: Household Survey

4.2.4.1. Synopsis

The household survey aims to obtain a broad picture of the domestic economy in Kiau households, and to determine whether the main source of livelihood stems from subsistence farming or from an increasing dependency on the cash economy. The survey also aims to examine general attitudes towards forest use, particularly in terms of how much family units are relying on forest resources to support their domestic economy. In light of the increasing popularity and homegrown success of community-based tourism, the survey also examines general attitudes towards the use of forests for tourism (see Table 4.2.28).

Table 4.2.28. Household Survey: Synopsis

WHY?	To obtain an understanding of how Kiau Dusun family units value natural resources, specifically forest use, in relation to the domestic economy
WHAT?	Semi-structured survey of household income levels and attitudes towards natural resource use
WHO?	28 Kiau Dusun households
WHERE?	Kiau Nuluh

Admittedly, this survey was not part of my original design when I first embarked on fieldwork in Kiau. Increasingly however, I started to accumulate a number of interesting observations,

particularly on the issue of whether more forested areas should be opened up for agriculture. The debate of opening up forests for agriculture becomes more intriguing especially when family units are becoming more dependent on income generated from wage labour, and thus there are less and less people who have the time to work on swidden fields. In the process of exploring the issue, I encountered a degree of awkwardness when discussing money matters, where families with healthy domestic economies feel reluctant in revealing the proportion of income they obtain through wage labour. In an attempt to develop a quantifiable measure of these observations, I worked with GOMPITO to develop this household survey with the aims outlined in Table 4.2.28, so that data obtained in the survey would provide GOMPITO with a basis for addressing community concerns about the future of forested areas such as *Lokos Diou* (see chapter two, section six). GOMPITO is also interested in obtaining a broad perspective on the economic development of the community, that is, to identify (if any) target areas or groups that merit attention in relation to the development of community-based tourism.

4.2.4.2. Process

The survey was conducted as a GOMPITO initiative with my role limited to data processing, and thus ownership of the data remains vested in GOMPITO. GOMPITO requested all the 76 households in Kiau Nuluh to participate in the survey, with some households taking up to eight weeks to complete their participation. Each head of the family was invited to chair a household discussion (or series of discussions) on the issues raised in the survey, and come up with a response that reflects the general consensus within the household. Household members not normally residing in the village (because of employment elsewhere, education, or marriage) were exempt from the discussion, although any contributions they made to the domestic economy were noted. The confidentiality of the household discussion was up to the household members, where some households felt they needed to conduct the discussions in complete privacy while other households would seek assistance from GOMPITO members. Responses to the survey were completely voluntary and there are a number of cases where families did not provide a response on a particular issue.

For my part, households have to give consent for me to process their responses. I am not permitted to keep any records of the survey and the final dataset was handed over to GOMPITO. Additionally, households have to give consent for me to include their responses in this thesis. I feel these restrictions to be justified because of the potentially controversial nature of the issues raised in the survey, such as whether more forested areas should be opened for cultivation, or attitudes towards the distribution of benefits accrued from community-based tourism. These restrictions parallel feelings in other villages where I have worked, where segments of the community feel that differences in opinion within the village need not be aired to outsiders

because it may undermine the overall perceived solidarity of the community. I also feel that because this is the first ever survey of this nature in Kiau, people are justified in needing to secure their privacy, but that these tensions will gradually relax if such kinds of exercises are conducted on a regular basis and pursued with responsible intentions by village organisations such as GOMPITO.

The survey comprises the following sections:

1) Demographic information on the head of the household,
2) Demographic information on the members of the household, including members that no longer regularly reside in the village,
3) Assessment of household assets, including items such as land size, type and age of house, vehicles, and household goods,
4) Assessment of monthly household income, including the estimated equivalent monetary value of agricultural produce and contributions received from household members who are not regularly residing in the village where applicable,
5) Assessment of monthly household expenditure, including expenses for household members who are not regularly residing in the village where applicable (e.g. tuition fees for school children),
6) Assessment of forest use, including types of forest products and wild game normally obtained, and attitudes towards forest use and/or conversion,
7) Assessment of freshwater use, including information on fishing, freshwater fish ponds, and water pollution, and
8) Assessment of tourism potential, including participation in existing community-based tourism activities, and attitudes towards developing community-based tourism more intensively.

All responses had to reflect the assessment of the household unit, where households were free to record any differences in opinion within the household or contradictory opinions across issues. An important issue in developing the survey was to avoid, as far as possible, having discussions that reduced forest values to monetary terms, and thus there is an overall lack of emphasis throughout the survey on recording monetary values (except for the assessment of income and expenditure, which a number of households chose not to answer). For reasons of space, I am unable to address all of the above sections in detail in this write-up, but will provide a summary of the overall demographic information, and highlight some interesting results found in relation to forest use and attitudes towards forest conversion.

For the purposes of this dissertation, I am relying on the information provided by 28 households (or 37% of the village) to extrapolate a broad understanding of the overall domestic economy. These 28 households comprise 217 people, of which 110 people are adults above 20 years who are normally residing in the village (or 51% of the sample). The remainder of household members are school-aged people who are either attending primary school in Kiau or at secondary school boarding houses elsewhere. There are a few school-aged people who live in the village, having stopped secondary school for various reasons. I make the assumption that discussions and responses recorded reflect the opinions of adults 20 years and over who are normally residing in the village.

Demographic overview

Table 4.2.29 gives a broad overview of the demographics in this dataset. On average, a household comprises about eight people, quite commonly ranging from below ten years to above fifty years of age. As I mentioned earlier, school-aged children are normally attending either the primary school in Kiau or at a secondary school elsewhere. Results reveal that 19 (or 68%) households currently have children attending formal education.

Table 4.2.29. Household Survey: Demographic information

Demographic field	Response
Average household size	8 people
Children currently schooling	68%
Average household landholding	11 acres
Range in landholding size	< 3 acres to 20 > acres
Average household income	RM 700
At least one wage earner	86%
Monthly income range	< RM 100 to RM 2,000 >

All households own land (or recognise land as their property under NCR), the average household landholding being about eleven acres. There is however, quite a wide range in landholding size where some households only lay claim to three acres or less, while other households own more than twenty acres. Furthermore, 50% of the households have "idle land", that is, unutilised land and/or fallow. The size of such "idle lands" ranges from less than two acres to more than fourteen acres. On average, rice cultivation does not exceed more than three acres, where the remainder of the utilised landholding is used for vegetables and fruit trees or perennial cash crops such as rubber and coffee.

The average household income is about RM700 a month, although there is a great deal of variation between households. The monthly household income can range from less than RM100 to more than RM2, 000 a month. The monetary value of agricultural produce was a difficult task

for households to estimate in a standardised form, but this value very rarely exceeded more than RM500 a month. There is however a substantial emphasis on wage labour as the main contributor to the domestic economy, with 24 households (or 86%) having at least one wage earner. On average, each household has about two wage earners, including household members who may be living outside of the village because of their jobs. This figure is an underestimation of the proportion of wage labour because part-time work such as mountain guiding and driving can be conducted on a casual basis and often not considered to be formal wage labour. The kinds of informal wage labour include income derived from transportation services[24], construction services[25], community-based tourism activities[26], and contributions derived from government and NGO activities[27].

Households that have more wage earners tend to have higher monthly income levels, although this trend is difficult to establish statistically because a number of such households have chosen not to reveal their income level. Upon closer examination, I found these households who have chosen not to reveal their income to commonly have more than two wage earners, and comparisons against a household inventory of assets reveals that these households also have a number of "luxury" items such as vehicles, refrigerators, mobile telephones, and personal computers. It is ironic how wealthier households are more reluctant to declare their earnings, even though I feel that many other households deliberately declared a lower income. In relation to observations made throughout my fieldwork, I certainly believe that the overall income level in Kiau is higher than what was found in this survey, and that the rise in income level is directly related to the increasing number of wage earners who continue to live in the household.

Households were also asked to state their *desired* monthly income, and in all cases, the desired monthly income amounted to roughly twice the current monthly income. This is an interesting result because I had anticipated that all households could envision a desired monthly income that is roughly within the same range across the village. On the contrary, the resulting desired income levels retained the degree of financial stratification even though the absolute income per household would be doubled. It certainly suggests that even if their wishes came true and the overall standard of living was doubled across all households in the village, the poorest segment of the village would still remain, in relative terms, the segment of the village with the lowest absolute levels of income. It also suggests that the wealthier segment of the village are able to envisage experiencing a standard of living that is potentially four times more "luxurious" than the lower income households hope to achieve.

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[24] E.g. ferrying people to work places, usually Kinabalu Park, outside of the village, ferrying local produce, usually vegetables and fruits, to local markets, occasional car hire
[25] E.g. house building and renovation work
[26] E.g. transportation, food and board, cleaning and guiding
[27] I.e. funds for a village project are used to purchase materials and the remainder of funds are usually distributed as allowances to cover the time and effort of project participants

Overall, this dataset provides quite an interesting picture of the broad demographic situation in Kiau even though I feel that the assessment of income and expenditure sections were not accurately reported by all households. There is enough indication to suggest that wage labour is the dominant form of income generation, which raises questions about the future of swidden agriculture. As more and more young people are attracted to formal wage labour, so to are the current swidden farmers getting older and older, with little certainty as to who will continue the farming lifestyle. An increasing labour shortage for agriculture could mean that more and more land becomes "idle", an argument that is already apparent in the amount of unutilised land in this sample.

Assessment of forest values

Table 4.2.30 shows the overall resource use responses for this sample of households. At present, all households tend rice fields (wet and/or dry), fruit trees, vegetables, and some households also tend perennial cash crops such as rubber.

Table 4.2.30. Household Survey: Overall resource use

Activity	Response
Agriculture	100%
Collection of timber and NTFPs	100%
Hunting	71%
Fishing	93%

All households collect forest resources, ranging from wood for construction (e.g. small-scale construction of *sulaps*), fuel wood, bamboo, rattans, medicinal plants, fruits and vegetables. A forested area is considered to be *gouton*, while fallow is called *tomulok*. Collection of forest resources in this survey refers mainly to resources found in *gouton*, although it does include plant resources also found along the pathway to the forest (e.g. medicinal plants). All these collections are for domestic use and none were recorded as collections with the intention to sell. There are 19 households (or 68%) who report these forest resources to be increasingly difficult to find, and all households (100%) report these resources to have decreased. The reasons given for a decrease in forest resources include over-harvesting (e.g. rattans and timber trees), uncontrolled harvesting, increase in the village population and number of resource users, destruction of forests as a result of fires, and destruction of forests as a result of opening land for agriculture. As more forests are opened for swiddens, the remaining forested areas are becoming farther away from the village taking more travel time to get there in addition to more foraging time needed to obtain the decreasing number of forest resources.

This is also reflected in the responses to hunting activities, most of which are conducted in *gouton* (with the exception of birds and some small mammals). The survey reveals that 71% of households hunt regularly from as frequently as several trips per month to less than four trips per year. All of the households who hunt indicate that wild game is increasingly difficult to obtain. It is difficult to pursue this issue further because I am aware that villagers in Kiau have not yet been licensed to hunt and therefore people are careful as to the kinds of information they reveal about their hunting activities. Nonetheless, households do point towards over-hunting and decreasing forest habitats as reasons for the increasing scarcity of wild game.

There are 93% of households who fish in nearby rivers, whereby 100% of these households report that the number of fish has decreased. All the households report an increase in water pollution in the local rivers, particularly the pollution of the Kadamaian River as a result of building the access road and maintaining it from regular landslides. Other reasons given for the pollution of waterways include the run-off from pesticides used in agriculture, and tendencies of villagers to dispose of rubbish in the rivers. In turn, 57% of households are keeping freshwater fish ponds to ensure a sustained supply of fish. Upon closer examination however, people tend to favour the rearing of *talapia* fish, with comparatively less effort to rear species of fish that are found in the local rivers (e.g. *rokot, botuan*). Fish reared in ponds are never released into the local rivers to increase the "natural" population, but are kept for domestic consumption.

Attitudes towards forest conversion

There is immense support for the intensification of community-based tourism in Kiau, with the condition that benefits are distributed equitably across the village. Households agree tourism development would be an important way of income generation and creation of attractive jobs within the village itself, something that is currently lacking. A few households expressed concern about tourists introducing foreign cultural values into the village, while some other households did not see this as a concern and instead welcomed the opportunity to meet foreign tourists and learn about different cultures and languages. The survey reveals that 93% of households support the conversion[28] of forests to tourism, that is, using the forests as a basis for tourism activities such as jungle camping, trekking, and bird watching.

At the same time, 46% of households supported the conversion of forests to agriculture[29], specifically that more forested areas should be opened for agriculture over and above the

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[28] Common conceptions of forest conversion refer to a loss of forest as a result of opening land for a particular purpose. While the impact of forest conversion is not this drastic in the case of community-based tourism in Kiau, conversion of forests for tourism nonetheless means that certain parts (sometimes critical parts) of the forest will be opened to build resthuts, campsites, observation platforms, trails and bridges.

[29] This position does not preclude households from supporting to leave forests areas as they are, as households were not required to commit to a singular position.

existing plots of cultivated land and fallow. Reasons given for this include putting forested lands to use in a way that will bring about direct benefits. These households state that agriculture is their lifestyle and the way they support their families, and therefore more forested land should be opened so that they can increase their overall domestic economy whether by planting more subsistence crops or cash crops. Furthermore, opening land for cultivation is one basis for NCR and thus helps households to secure land claims (see chapter two, section five). There are households that feel if they leave forested areas unopened, these areas will remain as State Lands that will potentially be claimed by people external to the village. Some households, however, support the opening of only a portion of forested lands leaving the remainder as forest cover. These households recommend the establishment of a community resource management system so that forests and extraction of forest resources are managed properly. It is a fair estimate of attitudes towards opening more forested areas for cultivation, where roughly half of the community are in favour of the move while the other half are not. It is difficult to see how the pro-cultivation section of the community will be able to find enough labour power to work on more agricultural plots when there is already such a shortage of labour. A potential result is that if more forests are opened for cultivation they will end up being "idle land", which in a worst case scenario, may be reassigned to state control for other development purposes.

In contrast, 70% of households support leaving the forested areas as they are[30], in other words, not to open the forests for agriculture but to continue using the forest as they do now. One of the reasons is the existing abundance of *tomulok* that can be used or reopened for cultivation, without having to chop down any new forest areas. This appears to me as a slightly privileged response because not every household has the luxury of extra *tomulok* waiting to be used, and indeed, some households own very little land, all of which is currently under cultivation. Other reasons given against opening forests for cultivation include the need to maintain a large enough forest resource base where people can harvest non-timber forest products and continue to hunt for wild game. There are households who say that forested areas are needed as water catchments, to prevent erosion, and to keep the weather cold. They reason that the destruction of more forested areas would lead to the overall deterioration of the entire landscape. There are also aesthetic and existential values such as needing to maintain a green forest canopy that is pleasing to the eye, keeping forests as the heritage of future generations, and that having forested areas makes for carefree living without worries.

This part of the survey was deliberately designed to be open-ended where households were not obligated to decide on one definitive position at all times. Indeed, a number of households

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30 This position does not preclude households from supporting to convert forests for agriculture, as households were not required to commit to a singular position.

provided seemingly contradictory responses wanting on the one hand to open more forests for cultivation and yet realising the need to keep forests intact because they rely on the forest resources found within. The overall results show quite a diverse range of opinions on forest values and what actions should be taken to manage and use the remaining forest areas in Kiau. It is clear that the majority of households are in support of using forests for tourism benefits, but this action may have to be compromised with the pressure to open at least a segment of these forests for more agriculture. I feel that if GOMPITO were able to resolve the financial difficulties of poorer farming families by enhancing their participation in tourism activities or helping their children find jobs, perhaps the pressure on opening even more forests will gradually relax.

4.2.4.3. Conclusions

As a whole, the survey results indicate a degree of financial stratification in the community, which potentially could become a pattern of stratification that continues over the coming years. High income families tend to have more wage earners while low income families tend to rely on subsistence agriculture as their mainstay. Should the attraction of financial remuneration turn more people towards wage labour, then there will be an increasing labour shortage to work on agricultural fields. Decisions, therefore, have to be made to manage the remaining tract of forested lands so that forests are not being opened for cultivation when there are not enough people to tend the crops. The situation is more complex because low income families with little landed assets may decide to open forested areas irrespective of whether they have enough labour power to keep the land under cultivation because opening the forests establishes their NCR over the land, thereby securing substantial capital assets that can be sold or used as collateral for bank loans and credit payment schemes. Tourism may be the popular solution to alleviate the financial difficulties of some households, but tourism activities *per se* do not guarantee any legal tenure over the forested lands. Furthermore, given the existing inequitable distribution of tourism pay-offs in the community (see chapter three), it is difficult to say if tourism benefits will actually go to needy households or be used to boost the financial advantage of high income families.

The results also show an overall pattern of heavy resource extraction, where households recognise that forest and freshwater resources are becoming scarce as a result of unregulated harvesting. Left unchecked, this pattern of extraction will have disastrous consequences for the future sustainability of natural resources whether land, forest or rivers. However, the comparatively high and growing number of wage earners also means that there are more people living in the village who have the qualifications, knowledge, skills and experience to address the issue of natural resource management. Villagers who work at Kinabalu Park, for instance, voice strong support for developing community regulations and management systems to safeguard

forest resources. Similarly, villagers who are teachers at the primary school tend to place emphasis on developing educational activities to involve young people in understanding and managing natural resources. Those villagers involved in tourism activities in Kinabalu Park and around are also the segment of the community that is most vocal about converting forests for tourism values as a solution to meeting financial commitments. In all of this, GOMPITO will play a crucial role in catalysing the overall planning for, and management of, natural resource use patterns with specific attention on the remaining tracts of forested areas such as *Lokos Diou*. This will be an immensely difficult task because GOMPITO needs to address the inequities between financial strata when GOMPITO members themselves are embedded at different levels within this very pattern of stratification.

At the heart of this debate is an impressive degree of self-awareness in the community. The survey responses reveal a great deal of inward blame, that is, people are willing and able to say that they are the cause of forest degradation and resource loss. Of all the villages I have worked with in Sabah, I find this kind of attitude to be very rare because villagers often blame the incursion of outsiders for loss of land, destruction of forest habitats, pollution, and erosion of cultural values. However, when we consider the catalytic role Kiau has played in the last 150 years, it is easy to reason how the active participation of Kiau Dusuns as agents of change has also perpetuated an ingrained sense of responsibility and accountability within the community itself. It is this awareness about the implications of their actions that makes Kiau a crucible for fresh and innovative ideas about how the community can address their current problems and make their lives better.

SECTION THREE: THE STATE OF KNOWLEDGE

4.3.1. Some preliminary conclusions

This chapter explores how widely and evenly knowledge about plant names and uses are distributed across informants from a variety of backgrounds. In this process I have used a variety of methods to examine patterns of variation in what people know about plant names, life form, use, as well as the nature and regularity to which people are interacting with plant resources. As I mentioned at the start of this chapter, my research is not seeking to define the parameters and describe a body of indigenous plant knowledge that is "out there". On the contrary, my research results show that people are accessing and expressing fragments of plant knowledge, in part determined by the method of enquiry, that all together forms the larger patchwork of Dusun plant knowledge. This research is one preliminary step that, along with the

efforts of GOMPITO and larger projects such as the *Dusun Ethnoflora*[31], contributes to mapping the broad and detailed baseline about the substance and form of Dusun plant knowledge. Towards this aim, I therefore postulate the following preliminary conclusions:

Sharing and fragmentation

My results reveal that Kiau Dusun plant knowledge is part of a larger body of knowledge found among the Dusun villages around Kinabalu. This shared body of plant knowledge is a vast and deeply elaborated knowledge that includes biological, ecological and utilitarian conceptualisations of plants. It is however, a body of knowledge that is fragmented. As a general observation, people tend to know more about plants they have more contact with, whether it is plants found in their local habitat, daily routines, or according to the degree and kind of interaction they have with the plant world.

An important conclusion from this result is that there is a potentially high level of theoretical plant knowledge, where people still know about plants even though they are no longer interacting with these plants. The Plant Manual is an example where people prioritised medicinal plant knowledge as one kind of knowledge they no longer apply but are enthusiastic to preserve. The Plant Trail results show that Kiau Dusuns are able to recall names, life form categories, and uses of plants, but nonetheless admit they do not use these plants on a regular basis. This pattern of interaction with the plant world is reinforced by the Household Survey results that show forest resource use to be of little contribution to the domestic economy compared to the significance of wage labour. There is however, high dependence on food plants for daily subsistence, which is portrayed in the repeated salience of food plant knowledge across all surveys.

The window into daily routines provided by the Household Survey indicates that people can rely on a variety of plants for a number of uses, but the range of plants and uses portrayed in this study do not reflect the much larger range of plants found in the Free Listing task. Put simply, the average Kiau Dusun farmer is interacting with a relatively small range of plant resources given that Dusun plant knowledge potentially incorporates knowledge of at least 500 taxa. Kiau Dusuns who have jobs, and those who leave the village for education or employment, would presumably have even fewer opportunities to interact with the plant world, or they could be interacting with the plant world in a different way compared to their counterparts in the village. Thus, while the Kiau Dusun may very well have access to a larger shared body of plant knowledge, the practical reality of how they are interacting with plants leaves little room for them to apply and develop their plant knowledge. As argued by the *principle of fit*, the kinds of

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[31] The *Dusun Ethnoflora* is a proposed result of the PEK (see chapter two, section six; also Martin et al., 2002)

knowledge that people are expressing is constrained by circumstances and outcomes in their normative reality.

Wider and localised forces of change

In chapters two and three I mapped the forces of change that play a role in shaping normative reality in Kiau not so much as an explanation of how and why plant knowledge is fragmented, but as a contextualisation of Kiau Dusun "social place". The malleable boundaries of ethnic identity, for example, both impose upon and attract Kiau Dusuns to cultivate an idealised sense of development. As part of the Kadazandusun ethnic group, the Kiau Dusuns cannot escape being courted by the cultural momentum of establishing political legitimacy, and thus there is an emergent generation of Kiau Dusuns who identify with the educated and urban lifestyles of their Kadazan counterparts. Additionally, GOMPITO's collaboration with outside agencies further accelerates Kiau's incorporation into the melee of issues that characterise the statehood of Sabah. In March 2003, GOMPITO hosted a PACOS inter-village gathering with more than 80 village representatives from all over Sabah converging for a three-day discussion and training forum in Kiau. Furthermore, as a World Heritage Site, Kinabalu and the surrounding areas such as Kiau will continue to attract the attention of naturalists, conservationists, tourists, and capture the imagination of local people. We can see how the interest of UNDP GEF in Kiau is an important indication of how the Kiau Dusuns may very well internalise and enact an ethic of biodiversity conservation and sustainable natural resource use.

A clear measure of these changes can already be seen in the patterns of plant nomenclature, as reflected in the multilingual thread running through the results presented in this chapter. In my field experience, I found that informants quickly switch to Bahasa Malaysia as the common fall-back option because it is the *lingua franca* that is immediately accessible to the majority of people. The issue therefore turns to the question of how the Kiau Dusun can maintain their plant knowledge when the main medium for the transmission of indigenous plant knowledge is in a Dusun oral form. I have seen efforts to document plant knowledge in other villages where a Dusun oral tradition is being transcribed into Bahasa Malaysia. While this has presented Dusun villagers with some sense of security (in that they can all access some common understanding), it has also presented some measure of problems in trying to translate Dusun concepts (e.g. illnesses such as *oingkat*) that do not have equivalent terms in Bahasa Malaysia that satisfy people as an accurate translation. This is a clear and present challenge when we consider how the potentially large body of theoretical plant knowledge can be transmitted to a younger generation who are more comfortable with Bahasa Malaysia. The situation becomes more complex, where people of

all ages in Kiau are concerned about learning English[32]. The mountain guides and a number of young people have told me that English is an important advantage to secure jobs, such that villagers involved in the tourism and conservation sectors are already using English and Latin plant names when talking about plants.

Without prejudice to the rights and wrongs of these changes, I contend that decisions about the nature of change are part of the ongoing negotiation between the Kiau Dusun and their surrounding environment. Consequently, change is the nature of normative reality, whether it is the effect of internalising an imposed agenda or an internal, and possibly, inherent propensity to seek out solutions to contemporary problems. The state of Kiau Dusun plant knowledge must therefore be seen in relation to this ongoing process of change because it is knowledge that is grounded in the ability of the community to manage its integrity, and is above all, in the process of continuous evolution.

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[32] At the time of writing this dissertation, a foreign tour operator has sponsored an Australian volunteer to live in Kiau and give free English lessons to young people and adults, over a two-year period.

CHAPTER FIVE: EVALUATION

"The essential feature of the capacity to deal with change is an appreciation of the past and where one has come from. Thus, people can deal with change when they know that their past was a valuable experience in preparation for the future, when their past is viewed in such positive terms as a foundation for dealing with change."

George Appell, 1986

SECTION ONE: THE STORY SO FAR

5.1.1. Applying blame

The overall objective of this dissertation is to explore variation in the distribution of Kiau Dusun plant knowledge using a contextual analysis of the wider and localised political, economical, social, cultural and environmental dimensions of the Kiau Dusun community. In a spatial sense, I have discussed how Kiau Dusun plant knowledge reflects the changes that are happening inside the village, in relation to the larger forces of change that embed the Kiau Dusun community within the statehood of Sabah, which in turn, is part of the Malaysian nation. I have also situated this argument within a temporal sense of interrelated changes, whereby the character of present day community and statehood is embedded in resolving changes that are, inevitably, historical processes. For that matter, I have invested substantial effort in charting the wider and localised historical developments that play important roles in defining contemporary Kiau Dusun "social place". The rich and, in some cases, intricate details in chapters two and three are presented to portray this very dialogue of change with a texture and flavour that cannot be captured by virtue of statistical analysis alone. In this light, I have designed chapter four to present a quantifiable exploration of contemporary Kiau Dusun plant knowledge not merely as a statistical chart of knowledge variations, but as a reason for action, that is, to provoke an understanding of what these variations in knowledge can tell us about the changes that are taking place around and within the community.

This entire thesis is a rationalisation of contemporary Kiau Dusun plant knowledge where shared and fragmented parts of knowledge are situated within a web of changing circumstances. As I discussed in chapter one, recent trends in anthropology advocate a holistic approach to studying indigenous knowledge, and to avoid the tendency towards theoretical reductionism. I advocate a synthetic conception that brings together perspectives in both the social and biological disciplines as a means of strengthening an evolutionary understanding of the processes that underlie indigenous plant knowledge (see chapter one; Boyd and Richerson, 1985

for a discussion on dual inheritance theory; Toledo, 2002 for a discussion on ethnoecological frameworks; Wyndham, 2002 for a discussion on the human ecosystems approach). For the purposes of this dissertation, any attribution of causality in knowledge variations as a result of a recently imposed development agenda undermines the legitimacy of the Kiau Dusun as proactive and reasoning beings with their own history. Consequently, any attribution of causality as a result of a specific variable or set of variables within a recently imposed development agenda isolates these variables from the web of interrelationships that continue to jointly and mutually define Kiau Dusun "social place" over space and time. In the hands of legislators, policy makers, and politicians, it is this very brand of reductionism that comprises a dangerous platform for action. On the other hand, an inability to dissect, from the larger story, the probable root causes for knowledge variations makes it virtually impossible for organisations or individuals to take action if such action is needed, thereby rendering my research as an academic contribution with little feasible practical application.

It is with this ethical conscience that I highlight the following issues as catalysers in understanding variations in Kiau Dusun plant knowledge, given that "the roots of sustainable development must be set within the society itself, in order to allow people to plot their own course between the past and the future, to draw upon resources from inside as well as outside, and to use their own traditions as the basis for change" (Nakashima, 1998 pg. 9). The following is a an overall evaluation of Kiau Dusun plant knowledge with the aim of drawing attention to potential areas where plant knowledge can continue to be reinforced.

SECTION TWO: ISSUES

5.2.1. Fragmentation

My research reveals that Kiau Dusun plant knowledge is a vast reservoir of elaborate knowledge, including knowledge about plant morphology, nomenclature, use and symbolism. As I mentioned in chapter one, this is hardly the limit of Kiau Dusun plant knowledge because there remains a vast repertoire of indigenous knowledge and skills, such as those about plant management, ecology and innovative use, which I have not been able to address within the scope of my fieldwork. Despite the increasing prevalence of the Bahasa Malaysia and Kadazandusun literary systems, this body of indigenous knowledge continues to rely on established practices and institutions in the community, in addition to the Dusun oral tradition, as mediums of transmission (also Florey, 1991; Nabhan, 1998). While I have not examined the contents of this knowledge in exhaustive detail, I have examined how widely this aspects of this knowledge is distributed across the Kiau Dusun community. I argue that this body of plant knowledge, in its

Dusun oral form, is fragmented in three broad dimensions. In sum, there are variations in the knowledge about different kinds of plants, variations in the knowledge between different kinds of people, and that knowledge itself can be characterised as either theoretical or enacted (practical). In the following section, I discuss each of these dimensions separately in order to systematically elucidate the specific details of each dimension, but this in no way diminishes the manner in which these dimensions are overlapping and mutually interdependent.

5.2.1.1. Different kinds of plants

Kiau Dusun plant knowledge is unevenly distributed depending on plant habitat and local use. Plants found growing in areas closer to the village and in swidden fields are the more salient kinds of plants. There is less prominence given to plants found growing inside old secondary and primary forests, an effect further compounded by the rapid rate of decreasing forested areas, such that, what is left of forested areas is receding farther away from the village. The increasing number of resource users also means that more people are harvesting what little is left of the remaining forest resources. As a result, there is generally less contact between plants found in forested areas and resource users, because either the forest is too far away or forest resources are getting harder to find. A similar conclusion is described by Heckler (2002) in a study conducted with three different communities of the Piaroa of the Venezuelan Amazon. In her study, she found that communities who live closer to forested areas have more elaborated knowledge about the names and uses of plants in their local habitat compared to communities who live in semi-urban conditions that are further away from forested areas. Heckler (2002) suggests that inter-community differences in this sense are not merely a product of vicinity to the forest, but are also motivated by a deeper sense of change whereby people are no longer looking to the forest to provide for their livelihood needs, which is an attitude that is more evident amongst communities who live much further away from forest habitats. It is certainly a convincing argument in the case of the Kiau Dusun where the value of forests and forest products has diminished in light of alternatives and opportunities presented by changes in the political, social, economical and cultural environments.

A different consideration is the increasingly popular idea of tourism value, in that knowledge about forest resources and indeed, the entire forest itself, are the kinds of knowledge that are marketable through tourism activities, thereby providing an interesting, sustainable and profitable opportunity to reinforce knowledge about forest plants and indeed local management of forest habitats. In other words, tourism may present a means to reinforce knowledge about plant resources by taking into account the sustainable management of the ecosystem as a whole (Poffenberger, 1997). The role of local people in conserving their surrounding environment is exemplified in a study conducted with Native American populations living in the Colorado

Plateau, where researchers found that the traditional ethnobiological knowledge of local communities contribute, whether intentionally or indirectly, to the conservation of particular floral and faunal species (Nabhan *et. al.*, 2002). The authors argue that local people's knowledge of, and familiarity with, their surrounding natural ecology makes them the default habitat managers of these environments. It is a case in point where indigenous plant knowledge extends far beyond the basics of recognition (naming) and application (use), but also encompasses a wealth of intricate knowledge about habitat management. Nabhan *et. al.* (2002) argue that some local communities intentionally protect rare species and invest careful consideration in the preservation and restoration of the species habitats, especially when these species and habitats have a particular social, cultural or economical value. In the case of Kiau, it could well be that tourism value provides the economical motivation for local people to conserve forest plants and habitats in a way that relies on, and mutually reinforces, their indigenous plant knowledge of this local environment.

In relation to my data, it therefore comes as little surprise that cultivated and managed plants are the kinds of plants that people are most knowledgeable about. This covers subsistence crops grown in swiddens, cash crops, and a large number of plants growing in the village area such as fruit trees, bamboos, medicinal plants, and ornamental plants. Knowledge about food plants is the most salient kind of knowledge, even though I have come across overwhelming enthusiasm in the community to record medicinal plant knowledge. Food plants are an important feature of the daily routine because agriculture is still the main form of subsistence. Households depend on food crops and forest resources for food, where the financial contribution of wage labour is injected primarily into meeting payments for education, and the acquisition of vehicles or household goods. In contrast, the increased accessibility to, and affordability of, substitutes such as modern medical health care means that medicinal plants are not being used regularly, in the same way that over-harvesting of large timber trees and rattans have replaced these construction plants with materials bought from sawmills and hardware stores. Knowledge about plants whose uses are no longer relevant is more fragmented. People may know only fragments about plants that are no longer being used, whether it is bits and pieces about the plant name, life form or use, compared to the elaborated knowledge people have about the plants they are currently using.

In terms of the *domain of thought* argument, I have shown that the ways people conceptualise plants are not stagnant constructs. First, there are different kinds of conceptualisations that vary in their salience levels, to a large degree, reflected in the different ways plants are featured in Kiau Dusun plant knowledge. Both the utilitarian and biological conceptualisations of plants feature as two interrelated, but nonetheless different, skills. I found that people generally have

co-existing utilitarian and biological conceptualisations, although the salience of utilitarian conceptualisations is more variable over and above the knowledge about biological characteristics. In cognitive terms, this finding does not grant either utilitarian or biological knowledge as the sole primary basis of a conceptualisation because such conceptualisations of plants are expressed according to the relevant terms of enquiry about the characteristics and significance of a plant. Second, there are varying degrees to the elaboration of a conceptualisation, that is, how much people know about a particular plant. People tend to have elaborated conceptualisations when the plant is a relevant feature of their daily routine, and are quite likely to remember this knowledge even when the plant is no longer being used regularly.

I postulate an overarching conclusion that is deceptive in its simplicity: people have elaborated plant conceptualisations, and therefore develop plant knowledge, about the kinds of plants they have more contact with. People may nonetheless continue to remember knowledge about plants they no longer use regularly, but this is a kind of knowledge that is divorced from practical application and is therefore becoming increasingly theoretical. Because Kiau Dusun plant knowledge is developed and elaborated on the basis of regular contact with plants, theoretical plant knowledge faces limited opportunities to be the kind of knowledge that is maintained across the community.

5.2.1.2. Different kinds of people

The second aspect of fragmentation is that plant knowledge is distributed unevenly across different groups of people in the community. The most crucial aspect of this fragmentation is the rift between the young and older people. My data reveals this is not simply an effect of age, and I certainly speculate that a longitudinal study would not corroborate a pure age effect. Rather, I contend the rift in knowledge is a result of various factors that people are exposed to at different stages in their lives - which, for the Kiau Dusun, are stages that correspond to the different changes in their surrounding human ecology.

These changes are apparent in the shift in mode of production, where subsistence swidden farming has been continuously discouraged by way of legislation and government policy. This shift is not based on a temporal framework because different segments in the village, and even different aspects within each household, are shifting at different rates within the same timeframe. Nevertheless, I found that even with employment and education as priorities, families still rely on subsistence agriculture, with some families relying wholly on farming as their mainstay. There are, however, vocal segments in the community who identify with plant research and conservation, while advocating tourism value. They represent groups of mainly wage earners, who have different ideas about managing natural resource use compared with the existing

generation of swidden farmers (see also Heckler, 2002). Additionally, a generation of Kiau Dusuns is emerging, who nurture aspirations for tertiary qualifications, modern lifestyles of their urban counterparts, who have travelled and lived away from the village. These are people most detached from regular plant use and are also the generation where plant nomenclature is multilingual (also Florey, 1993). The division between groups are by no means mutually exclusive and I have seen young people especially, drift from school to swidden farming to tourism, bringing an element of each perspective into their aspirations. These groups represent the different and sometimes divergent attitudes about the future of the village, which for our purposes, questions the role that plant resources will continue to play in their lives. This finding, albeit preliminary, echoes the results found in other research projects, of which the study by Ross (2002) among the Lacandon Maya examines how erosion of indigenous knowledge is linked to inter-generational change. It was found that although indigenous plant knowledge of plants in the agricultural plot is widespread between younger and older generations, it is the level of expertise about these plants that differentiates between generations. This is magnified by the essential perception of each generation as being different from the other generation, such that young people do see themselves as being more alike to other people from the younger generation, and different from people in the older generation. Certainly, Ross (2002) argues that the inter-generational differences are spurred by ongoing cultural changes that affect environmental cognition and environmental decision-making and behaviour.

There is also a group of informants in my data that cut across the divisions I describe above, who possess a deeply elaborated reservoir of plant knowledge. None are younger than 38 years, and this group is made up of all sorts of respected people in the village from the very elderly to contemporary village leaders, full-time wage earners, degree and diploma holders, mountain guides and swidden farmers. While this may correspond to a category of "older generation" as seen in Ross's (2002) study, the apparent intra-generational diversity of this group of informants reflects the high degree of social mobility in Kiau, where people with seemingly "traditional" knowledge have become involved in a diverse range of "modern" activities. They represent a mix of ideas about the future of Kiau, whether it implicates involvement in the politics of Kadazandusunism, getting jobs in urban centres, sending their children to university and technical colleges, or building upon tourism and conservation in Kinabalu. There is great merit in conducting further research with this particular group of informants to explore the extent of intra-generational variation, whether there are sub-groups that converge on shared attitudes and perceptions, and how indigenous plant knowledge varies between intra-generational sub-groups.

The Kiau Dusun are an excellent example of an *eye of the beholder* argument, where there are a variety of self-concepts within the community with each self-conceptualisation seeking to advocate its particular attitudes and lifestyles to others. I also found an impressive sense of community that runs across different groups throughout the village that builds upon recognition of Kiau-specific qualities (chapter three). I have explored how these self-concepts are rooted in vastly complex and elaborate developments in Kiau's own history, and the history and future of Sabah itself. For that matter, reinforcing plant knowledge must also take into account the process of rationalising between an internalisation of their past and aspirations of a desired future.

A brief note should be made about the lack of a significant gender effect in my data. While I have not been able to satisfactorily account for this discrepancy within the timeframe of my fieldwork, there is an interesting argument presented by Heckler (2002) as a result of her research with the Piaroa. Heckler (2002) suggests that women are operating within an increasingly narrow sphere as a result of men becoming more involved in the cash economy, in addition to the absence of children who are required to attend school. Women therefore, have to compensate for this lost labour in order to fulfil the household's daily subsistence needs, whether this means additional labour on home gardens or caring for younger children, which "leads to a decreased knowledge of and interest in forest plants" (Heckler, 2002 pg. 545). In the case of Kiau, this could be represented as gender specific reservoirs of knowledge that are diminishing simultaneously across males who are increasingly involved in wage labour and the cash economy, as well as across females who simply have less time and motivation to interact with the plant world.

An overall conclusion from my research is that people who use plants on a regular basis tend to develop elaborated knowledge about these plants. I also found that people generally know more about plants than they are actually using plants, as is the case with medicinal plant knowledge. More importantly, people are generally busy and what little free time is left is often preferably and deservedly spent on leisure. Thus, there is limited opportunity, for people to step out of their normal routine to deliberately seek out plants that have no direct relevance to their self-concept. Similarly, there is limited motivation for young people to acquire knowledge about particular plants when this knowledge is of limited relevance to their lives, and certainly, when their self-concepts are contingent upon aspirations that do not prioritise plant use (also Nabhan, 1998).

5.2.1.3. Different kinds of knowledge

Perhaps the most significant finding of this research is the recognition of a theoretical body of plant knowledge in the Kiau Dusun community. I feel it is a status of knowledge that the community is largely unaware of, even though they openly express fears that aspects of their plant knowledge are in danger of being forgotten. In sum, theoretical knowledge refers to knowledge about plants that is no longer being used regularly, and therefore is a kind of knowledge that has been divorced from practical application. Much like the knowledge about *lamba* cloth-making, I contend that theoretical knowledge is most at risk of eroding because the medium of an oral tradition does not provide a secure and sustained means of transmitting this knowledge in the absence of practical application (Nakashima, 1998). It is easy to speculate how details about the exact folk-species to be used and how to go about using it will gradually blend and fragment with each recollection and perhaps fade into the domain of folk-legends. This is already becoming apparent with legendary aphrodisiacs such as the *soriondou* (*Eurycoma longifolia*), such that young people can roll out stories about its potency without any grounded knowledge of what the plant actually looks like.

There are two important features of declarative plant knowledge in Kiau. First, it is largely first generation theoretical knowledge, in that there are people, particularly the older generation, who have theoretical knowledge about plants that they have used before – it is just that they are not using these plants anymore. When this first generation of theoretical knowledge gets passed on to other people purely as theory (without practical application), then I would see it as second generation theoretical knowledge. What is currently known about *lamba* cloth-making is an example of second generation theoretical knowledge, and we can see how its second generation status is already sufficient to distort and fragment knowledge about *lamba* cloth-making to the point where people do not know enough to actually make the cloth. Second, I found that first generation theoretical knowledge is generally well elaborated especially among the older generation. It is therefore crucial for the survival of this knowledge to ensure that a practical application is maintained, so that this older generation can secure a means of sustaining and transmitting their elaborated levels of plant knowledge.

There is therefore a practical or enacted kind of plant knowledge, where people are utilising and maintaining their knowledge of plants by virtue of regular application. This is the kind of knowledge that is most likely to be transmitted, where children admit they know about a plant because they have seen their parents using it in a particular way. Indeed, Zarger (2002) argues that children acquire plant knowledge mainly within the context of experiences at home. Both boys and girls acquire traditional knowledge not just from their parents, but also from grandparents and siblings, where this form of socialisation is most crucial in the ages of five to

seven years. This raises the issues of precocious acquisition of traditional knowledge, such that scholars such as Hunn (2002) argue there are innate predispositions to acquire knowledge among young children. Hunn's argument relates to the developmental learning curve where learning is at its most intensive in the early years of human development and gradually levels off at adulthood, such that learning at adulthood "is neither so readily nor so deeply acquired" (Hunn, 2002 pg. 611). While I concur with Hunn on this matter, it is however, altogether another issue as to whether these innate predispositions are hardwired to acquire knowledge specifically about *natural kinds*. I certainly contend that innate predispositions, should they be empirically proven to exist physiologically, would not discriminate against *any kinds* whether natural or otherwise. Rather, such innate predispositions (physiological or psychological) are apt to recognise interconnections that repeat themselves in various constructs in the surrounding environment. Environmental cognition is thus context-driven, where physiological and psychological mechanisms continue to make sense of whatever is in the surrounding environment, irrespective of whether it is a child is in a forest community learning about plants or a child in an urban centre learning about computer hardware. The context that feeds this process, or form, of knowledge acquisition thereby supplies the relevant information, or substance, about the environment.

To a very large degree and as I have described above, the future viability of indigenous plant knowledge depends on three spheres that characterise the substance and form of knowledge in the Kiau Dusun context. First, the *kinds of plants* that people are interacting with determine which plants people know about. Second, the *kinds of people* that interact with plants determine who in the community has plant knowledge. Third, *how* different people interact with different plants determines what it is about these plants that these people know about. This, however, is a meagre exposition of how knowledge is distributed across the community, but does not as yet address the issue of how these different aspects of indigenous plant knowledge are actually transmitted, which is an issue I discuss in the following section.

Let me first evaluate the fragmented distribution of knowledge according to the *principle of fit* argument, which states that people seek to match a salient self-concept with a salient plant conceptualisation. In broad terms, people who see themselves as plant users are thereby motivated to interact with plants and thus tend to have elaborated and more numerous ways of conceptualising plants. This has a particularly manipulative dimension where people promote a salient plant conceptualisation to support the legitimacy of their salient self-concept, and vice versa.

The key to this process of *fit*, and the basis for understanding fragmentation of Kiau Dusun plant knowledge is the match between conceptualisations and circumstances found in normative reality. My research explores how developments in Kiau Dusun normative reality correspond to the nature and number of plant conceptualisations and self-concepts in the community. I found that plants, and therefore plant conceptualisations, that are not relevant to normative reality have limited motivation to be maintained as part of a person's routine. Similarly, a person has limited motivation in maintaining a self-concept that is not supported by circumstances in his or her normative reality[1]. Furthermore, circumstances in normative reality are ongoing processes of rationalisation between a Kiau Dusun and his or her human and natural environment. So, if we look at how the Kiau Dusun fit within the wider context of the Kadazandusun community, the statehood of Sabah, and the national call for Malaysian unity, it becomes apparent that the Kiau Dusun community is itself fragmented according to how different groups feel they fit within a wider context (see chapter three). Even at the individual level, a person can have different opinions about how they fit in the village, and indeed, how the character of the Kiau Dusun community can be shaped to fit their own opinions. It is this political, economical, social, cultural and environmental fragmentation that emerges as an underlying thread when people talk about the role of plant resources in Kiau today.

The older generation are therefore faced with a dilemma. At the moment, they represent the fragment of the community with the most diverse and elaborated plant knowledge, but it is uncertain the degree to which their reservoir of knowledge will continue to change as they go about the various political, economical, social, cultural and environmental decision-making processes as part of their daily lives. On the assumption that there are intra-generational variations, questions need to be asked about the future viability of Kiau Dusun plant knowledge *if* indeed there are members of the older generation who see indigenous knowledge as having little relevance to their lives today. Furthermore the older generation have potentially very few candidates to pass this knowledge on to who will see this knowledge as relevant to their lives today. They also have very limited opportunity to pass on this knowledge in a viable form because the practical application of plants is becoming less and less important in daily lives.

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[1] I have discussed some obvious examples in chapters two and three, particularly the cases of the *bobolian* (priestesses) and *Ketua Kampung*

5.2.2. A result of methodology

Without doubt, the techniques adopted in this research play a pivotal role in shaping my decisions on how to present arguments about Kiau Dusun plant knowledge. The methodological implications of my research are fourfold. First, and in relation to the theoretical implications I describe above, the conclusions I am able to make from this study of Kiau Dusun plant knowledge hinge upon the issue of approach. It is crucial to consider that I have chosen to employ a contextual analysis to understand how a web of political, economical, social, cultural and environmental variables can interact in the maintenance of plant knowledge. For this research to simply say, for example, that employment and education are factors that fragment plant knowledge is to ignore the very meaning these factors can have for different segments of the Kiau Dusun community or how opportunities presented in employment and education represent internalised and rationalised components of a desired Kiau Dusun self-concept. This research therefore is the important preliminary, and inevitably cumbersome, step in contextualising Kiau Dusun plant knowledge within a framework that extends across time and space.

Second, I feel this research presents an opportunity to innovate participatory methods of elucidation in field techniques. I have specifically chosen to conduct exercises that, as far as possible, would downplay my role as an investigator. Rather, I have chosen to rely on joint discussions to elucidate information about plants, where informants are encouraged to explore their knowledge about plants in an interactive platform with their peers. While this kind of data may be difficult to quantify, its integrity and strength rests upon the participatory and often prolonged processes through which it has been collated, and therefore reflects the level of awareness that informants have gained by virtue of participating in such a process. I have relied heavily on this body of qualitative and participatory data in fleshing out the results tabulated from more question-and-answer techniques such as the Plant Trail exercise. In retrospect, I envisage a much richer and more relevant store of results if such a plant trail were designed on the basis of a transect that cuts across various plant habitats from the centre of Kiau to the thick of forest areas such as *Lokos Diou*. I am also compelled to urge the development of field techniques that employ mediums such as photography because these allow indigenous people to capture and present their interpretations of natural resources without having to isolate resources from the context of the wider human and natural landscapes. Another aspect is the use of combined latitudinal and longitudinal field methods that enable researchers and local communities to investigate more evolutionary perspectives of how indigenous knowledge is acquired, maintained and transmitted. Using my results and field experiences as a preliminary basis for further investigation, I envisage a very real potential for refining and innovating quantifiable measures for investigating indigenous plant knowledge that can both satisfy the

requirements of multivariate statistical analyses and nonetheless be accessible to, and can be achieved by, local communities.

Third, I contend that I may well have influenced the level of awareness (i.e. salience) people have about their plant knowledge, and certainly played some part in stimulating the work of GOMPITO. Quite simply, my presence as an outside agent with a curiosity in plant knowledge has heightened an overall appreciation of plant resources and compelled village curiosity about their own plant knowledge. I question whether the level of awareness about plant resources would have developed in this way if I had not spent the last four years studying plant knowledge in Kiau. The level of awareness about medicinal plants was heightened as a result of the Plant Manual exercise, which brought a largely theoretical body of knowledge to the forefront as a priority for revitalisation. In this light, I perceive my role of having introduced academic interests and methodological approaches to studying plant knowledge as yet another variable in the web of change.

Finally, and as an overall assertion of methodological implications, is the issue of benefits to the community that is being studied. I strongly believe that local communities deserve to benefit from any research exercise carried out with them. This whole research was designed as an academic contribution to understanding indigenous plant knowledge, as well as a practical contribution to the Kiau Dusun community that provokes their understanding and appreciation of their indigenous plant knowledge. It is for this reason that I have chosen to: 1) adopt a contextual analysis, using 2) participatory methods for mapping the status of Kiau Dusun plant knowledge, with the aim of 3) exposing the Kiau Dusun people to opportunities for reinforcing their plant knowledge.

SECTION THREE: ACTION

5.3.1. Revitalisation

As I noted earlier, the purpose of this chapter is to evaluate the overall results of my research. The preceding sections provide an interpretation of the ways in which indigenous plant knowledge is fragmented. This final section provides a conceptual means to address this fragmentation, so that indigenous plant knowledge can be produced and reproduced in ways that are seen as valuable by the local people themselves.

With the success of GOMPITO and sustained support from a number of government and non-government organisations, the Kiau Dusuns are in a rather privileged position to address any

concerns about the fragmentation of their plant knowledge. Thus far, I have come across a number of measures taken by the community to reinforce their indigenous plant knowledge including inventory-taking of the kinds of medicinal plants used, documentation of how to go about using plants, and actual simulation of plant use[2]. While the level of awareness and enthusiasm in the local community is very heartening, I find it difficult to envision that these seemingly *ad hoc* measures will provide any sustained impact on reinforcing plant knowledge unless the following are taken into account: the depth to which a plant conceptualisation is elaborated and diversified, the ability of a self-concept to accommodate value to plant resources, and most importantly, the relevance of indigenous plant knowledge in contemporary normative reality.

5.3.1.1. Circumstances in normative reality

The Kiau Dusun, and any other indigenous community for that matter, need to answer this question: Why revitalise and reinforce indigenous plant knowledge? Circumstances in Kiau Dusun normative reality indicate that certain types of plant uses are generally becoming less of a priority in daily routines. Any counteraction therefore calls for an understanding of how this body of knowledge will be relevant to the contemporary, and indeed, future needs of the community. I explore this by dissecting the question into two levels of action – revitalising theoretical knowledge and reinforcing practical or enacted knowledge.

Reinforcing enacted knowledge

This is perhaps, the easier body of knowledge to explore because it is visible in the current practices and institutions in the community. It is, so to speak, a living body of indigenous knowledge that, in cognitive terms, has a viable medium of expression in a contemporary context. As such, enacted knowledge is largely task-oriented and its maintenance is based upon ensuring that the practical application for this knowledge is perpetuated in some form that continues to be relevant in people's lives. While some people in the village feel that documentation is the basis for reinforcing plant knowledge, I do not feel this is the contingent or sufficient medium because the survival of enacted knowledge requires that this knowledge be put to regular practice. This is illustrated in a project conducted with the Warao of Venezuela where researchers compiled a bilingual manual on traditional phytomedical knowledge (Wilbert, 2002). The manual was specially designed for school children and contained information about medicinal plants that are still being used in contemporary contexts. It was found, however, that Warao school children were unable to relate to this literary medium as they found the words and images in the manual represented concepts that were isolated from contextualised meaning. As a result, school children did not manage to grasp or learn from this manual even despite the

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[2] E.g. demonstration workshops and learning competitions such as the GOMPITO house building contest

context of a formal classroom and teacher's guidance. The solution was to introduce a practical hands-on method of teaching that encouraged school children to interact, not only with the plant species, plant habitats, and practices, but also with each other, that the learning of phytomedical knowledge took place effectively. This experience is a lesson that is particularly relevant to the Plant Manual exercise, which shows how documentation is perhaps only the preliminary stage of indigenous knowledge preservation that needs to be followed up with an explicit emphasis on the practical hands-on learning of this knowledge[3].

This raises an issue not addressed in the scope of this dissertation – contexts that stimulate learning and knowledge transmission, which are embedded in the practices and institutions of the community. On the one hand, there are researchers who stress the importance of biological contexts to enhance the acquisition of indigenous knowledge. Shepard (2002), for example, argues that sensory cues such as the taste or odour of a medicinal plant are vital in enhancing how well that plant is remembered. I have already discussed the importance Berlin (1992) places on morphological cues, that is, the way the plant looks, as a basis for talking about plants and may well play an equally vital role in how plant knowledge is acquired. Similarly, comparisons between the Specimen Identification Task and Plant Identification Task in my research demonstrates the importance of ecological cues, in that informants were better able to recognise and talk about plants when in a natural habitat rather than in an artificial setting.

Other researchers, notably Hewlett and Cavalli-Sforza (1986), highlight the role of social and cultural contexts in the transmission of indigenous knowledge. The authors argue that one important vehicle for reinforcing knowledge acquisition is the family institution where family-based activities are a crucial foundation for passing on plant knowledge (also Nabhan, 1998; Zarger, 2002). In Kiau, this could be examined by observing how family members participate in a diverse range of agricultural activities and having home gardens near to the house where busier household members have opportunities to cultivate and manage food crops are examples where knowledge about food plants can be reinforced. This process encourages a family-oriented organisation to food intake, whether the preparation of daily meals or special meals[4], and encourages an appreciation of eating homegrown crops and home cooked meals (also Garine, 1990). House building is another example where people still apply this knowledge, for example, when building the family *sulaps*. GOMPITO's simulation contest that specifically involved children in house building was an excellent move, but longer term measures have to be taken so that the skills are not just reserved and sculpted for the once a year competition. This involves encouraging families to build *sulaps* together as a family activity that begins with

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[3] On several occasions I have observed the lack of a systematic attempt to integrate the Plant Manual into practical activities organised by GOMPITO or the primary school in Kiau.
[4] E.g. wedding banquets or post-natal meals

seeking out and harvesting the raw materials, processing materials, and building the *sulap* in the traditional way (i.e. without nails). This also applies to making the *sulap* furnishings and accessories as a family activity so that knowledge about the plant materials used in making *wakid* (carrying baskets) and *kukurungan* (chicken baskets) is put to continued practice.

In terms of community commitment to safeguarding transmission of knowledge, families therefore exploit their daily routine as the main medium for identifying where plant resources can contribute to, and be a part of, family activities that stimulate awareness about their way of life and provides a forum for households to discuss their future. Crucially, this process of reinforcing enacted knowledge opens the way for people to experiment and innovate their knowledge and skills about plant use in a way that is embedded in the practices and institutions within the community (Abay *et al.*, 1999; Nabhan, 1998).

A crucial point raised by Hewlett and Cavalli-Sforza (1986) is that patterns of transmission of knowledge are not restricted to parent-child communication (termed vertical transmission), even though this is usually the most important mechanism. Rather a there is also the horizontal or contagious form of transmission, where knowledge is shared between two individuals irrespective of whether they are siblings, peers, neighbours, traders, or casual acquaintances. This is in agreement with Zarger's (2002) argument that siblings or a child's peers play a crucial role in the transmission of knowledge among children. It is one account of how knowledge can be diffused rapidly within the community and is possibly the main mechanism for the transmission of new knowledge, such as tourism value, that penetrates from outside the community.

Revitalising theoretical knowledge

According to the *principle of fit*, theoretical knowledge faces the greatest difficulty in being maintained if no relevant application can be established and perpetuated in some form in Kiau Dusun normative reality. To begin with, documenting plant uses is a move that transcribes the oral into the written tradition, and certainly provokes the possibility that this will be the kind of knowledge we read about rather than the kind of knowledge we actually put to practice. If theoretical knowledge is meant to represent an historical record of plant knowledge then serious thought needs to go into methods of documentation, something that KLF has already started in Kiau. If revitalising theoretical knowledge is meant to rekindle practices, as in the case of medicinal plants, then practical measures have to be developed to ensure that this kind of knowledge has a *relevant place* in the daily routine. A relevant place is not merely a relevant function, but also includes issues such as having plants in an accessible location, in reasonable supply, and that people see how the use of such plants can fit into their daily routine and

contribute to the needs of their household (also Nabhan, 1998). GOMPITO's ethnobotanical garden is an example where medicinal plants are grown in an accessible location, and could potentially become a centralised nursery or seed bank that families tap into for their own home gardens. Crucially, families have to be committed to encouraging an interest in medicinal plants so that the harvesting, preparation and consumption of a traditional medicinal tonic is embedded in a practical kind of family ritual. There needs to be awareness that "traditional" medicine and "modern" medicine are not necessarily mutually exclusive domains (Leaman *et al.*, 1996), building upon the existing practice where a mother recuperating from a hospital delivery consumes "traditional" post-natal tonics to aid her recovery.

Revitalising theoretical knowledge is perhaps, more frustrating when so much effort that has gone into inventory-taking and documentation does not stimulate enough opportunities for this knowledge to be sustained, thereby rendering it as a cultural artefact transcribed in writing (Shepard, 2002). For that matter, I believe there are aspects of theoretical plant knowledge, such as the medicinal properties of large timber trees like the *binuang* (*Octomeles sumatrana*), that will not be able to find a sustained relevant place in contemporary Kiau Dusun practices and therefore a great deal of rational compromise needs to be made as to which kinds of theoretical knowledge will remain documented and which other kinds have the potential to be reinstated as practice.

I can however, postulate two possibilities for Kiau. First, the nature and number of theoretical bits of knowledge is not the same in all communities. Discussions with other Dusun villages around Kinabalu reveal that some other communities may still be practicing plant knowledge that is now theoretical in Kiau, thereby creating an opportunity for the Kiau Dusun to see how this knowledge can be put to practice in their own village, and vice versa. This process of exchange has immense potential for revitalising and maintaining a vast body of indigenous plant knowledge that continues to provide valuable contributions to contemporary Dusun lives.

Second, there are aspects of Kiau Dusun theoretical plant knowledge that have viable practical application and are the kinds of first generation theoretical knowledge that is still deeply elaborated (see chapter four). So while a process of exchange can happen between communities, this same process of exchange also needs to happen within the Kiau Dusun community. I believe GOMPITO has great potential in creating relevant place and instituting occasions where theoretical knowledge can be applied. In addition to calendar events, regular activities, such as apprenticeships with *bobolians* and other trades people like house builders, consolidate theoretical knowledge within the practices and institutions of the community (also Leaman *et al.*, 1996). Given that Kiau receives a weekly arrival of foreign tourists and with tourism as a

popular village agenda, there is ample opportunity to use tourism as a basis for motivating people to revitalise theoretical knowledge. Activities such as cooking traditional meals, using traditional dress, performing song and dance with traditional musical instruments, guiding in and around the village area, and conducting live demonstrations of how to weave *atap* leaves or make simple medicinal concoctions, are all examples of how theoretical plant knowledge can be put to practice in a very relevant and profitable way. Some caution, however, is required so that tourism activities do not resemble a showcase of indigenous knowledge and practices that are automatically staged for the entertainment of foreigners and remuneration of local villagers. Tourism should be portrayed as one platform for stimulating village-wide interest in the contemporary viability of outmoded practices, and thus used as a spring-board to conduct other non-tourist related, regular and more intricate activities that allow villagers to put theoretical knowledge to practice in their daily routines.

5.3.1.2. Elaboration and diversification of plant conceptualisations

Following on from the issue of how indigenous plant knowledge is relevant to fulfilling needs in normative reality, the subsequent question is what kinds of indigenous plant knowledge are we talking about, or in other words, where do we start? My research contributes this angle: an important part of reinforcing and revitalising plant knowledge is the decision as to what kinds of plants do people want to know about, or, to define the specific *domain of thought*. The first challenge would be to examine the kinds of plants available in Kiau, which involves looking at the local habitat and distribution of plants. Participatory techniques that involve inventory-taking, free listing, floral surveys, and vegetation mapping, are necessary methods that will help to elicit information about the kinds of folk-species currently found growing in the area in relation to the kinds of folk-species that people know about or can remember (Backes, 1999; Pretty *et al.*, 1995). Access to larger databases such as the PEK database provides crosscutting information about other Dusun villages, and is certainly a necessary tool in obtaining a wider picture of the kinds of plants that people are using around Kinabalu. This implies addressing the sustainable management of the entire ecosystem, in addition to knowledge about ecological relationships, in order to identify viable means for specific interventions such as transplanting forest plants or over-harvested plants into nearby home gardens or the GOMPITO garden (Maikhuri & Nautiyal, 2000). Adequate supplies of raw materials, sustainable cultivation and harvesting techniques should also be considered when creating avenues where plants can be used to satisfy daily routines and generate additional income (Arnold, 1997).

The second challenge is to strategically examine the kinds of plant conceptualisations that people want to maintain and develop, for instance, by looking at different kinds of utilitarian plant conceptualisations. Even though medicinal plant knowledge is high priority for revitalisation, it

may be more viable right now to start with reinforcing knowledge about food plants because food plants are an integral part of the daily routine. A clever twist to this move would be to extrapolate medicinal knowledge from the food plants that also have medicinal uses, such as *layo aragang* (*Zingiber officinale*), *sogumau* (*Alpina galanga*) and *tapayas* (*Carica papaya*). This builds upon the multiple plant conceptualisations that characterise the very richness and flavour of Kiau Dusun plant knowledge in a way that stimulates one plant conceptualisation to reinforce and revitalise a diverse range of plant conceptualisations.

The third challenge is to examine the level of elaboration of a plant conceptualisation, in that people maintain enough knowledge to actually put the knowledge to practice. This involves reinforcing and revitalising knowledge about plant names, morphology, distribution, life cycle, ecology, use, method of use, and potential for alternative applications (Maikhuri & Nautiyal, 2000). It is an opportunity for people to explore the plant world and innovate fresh applications where this body of plant knowledge can continue to be used, such as through tourism. The cultivation of a deeply elaborated plant conceptualisation means that people are using these plants regularly and that these plant resources have a secure relevant place in Kiau Dusun normative reality.

5.3.1.3. Relevance to the self-concept

Finally, my research argues that in revitalising and reinforcing their plant knowledge, the Kiau Dusun need to decide who are their target groups. My research reveals that the older generation know more about both theoretical and enacted plant knowledge, and thus effort should concentrate on transmitting their knowledge, whether in oral or written form, before these people pass from the community. While there should be great emphasis on encouraging young people to acquire this knowledge, there should also be equal emphasis on encouraging people of all ages and backgrounds in the village to participate in the revitalisation and reinforcement of plant knowledge.

The *eye of the beholder* argument states that a person can rely on multiple self-concepts that define their membership in a particular group of persons, where such self-concepts are not necessarily mutually exclusive. There are two feasible ways to address this issue: specialisation and sharing. First is to exploit the existing plant knowledge of a particular group by encouraging and providing opportunities for this group to develop their specialised plant knowledge. For example, the mountain guides in Kiau have a vast knowledge of forest plants, and even high montane plants, that they have developed over years of guiding tourists through the forested areas in Kiau and up the summit trail. This group of people can potentially develop a more diverse and elaborated knowledge about these plants because it is this very kind of knowledge

that makes them popular and successful guides. Additionally, these guides would be able to train other community members interested in tourism as a foundation for transmission of knowledge that has a relevant place in Kiau Dusun normative reality. Second, and perhaps far more challenging, is for organisations like GOMPITO to propagate a Kiau Dusun self-concept, or number of self-concepts, that promote the sharing of plant knowledge, thereby building upon the existing sense of community in the village. I found many people interested in plants but few can find the time or space to develop plant knowledge or put this knowledge to practice. The most optimistic strategy here is to raise awareness that aspirations for urban modernisation, high-paying jobs, and university qualifications do not conflict with an affinity for the plant world. I have seen people from other villages who continue to weave mats, cook traditional dishes, and keep small herb gardens even though they now live in urban towns.

5.3.2. Debunking romance

In this dissertation I have presented a rather unusual case of an indigenous community who experience change as something that is both expected and peculiarly healthy. To explore this case, I have framed my enquiry by looking at the contextual bases upon which their indigenous plant knowledge is distributed. It is a snapshot that attempts to elucidate the various influences that permeate within the community. Foremost in my argument is the notion that variations in plant knowledge can be attributed to a number of contextual influences whether political, economical, social, cultural or environmental. Furthermore, these contextual influences are a product of changes that penetrate from outside the community as well as changes that take place *inside* the community *itself*. *And finally*, these changes comprise the foundation for the community's historical development, whereby the value of *indigenous* plant knowledge stems from a deep appreciation of their unique history.

There is a very real danger of portraying indigenous knowledge as a key to the survival of traditional lifestyles. It is a perspective that invites the perception of indigenous communities as romanticised artefacts struggling to keep the past alive in today's context. Indeed, our traditional past is a vital and vivid definition of our present. In much the same way, our present is also defined by aspirations and ideas about the realisation of an appealing future. For the Kiau Dusun, the momentum to revitalise and reinforce plant knowledge demonstrates the significance of this body of knowledge, not just as an artefact of their unique history, but also as an essential component in the complexities of the present day context, and as an elaborate personification of realising a desired future. Contemporary Kiau Dusun plant knowledge is in a constant process of evolution as part of the Kiau Dusun negotiation with change. It is this stimulating process of ongoing rationalisation, over space and time, that continues to shape and reshape the character of their plant knowledge today.

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