

# Living Knowledge

Institutionalizing learning practices  
about biodiversity among the Muinane  
and the Uitoto in the Colombian Amazon



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## INTRODUCTION

It is claimed that about three-quarters of all major medicinal plants in international commerce are used in ways first devised by folk doctors and shamans at their place of original collection (Hecht and Cockburn 1989). Although estimates vary concerning the role of indigenous peoples in the search for potential sources of new medicines, most agree that it is important, both for sustaining their own livelihoods and for global health. Some propose that traditional knowledge increases the efficiency of screening plants for medicinal purposes by more than 400 percent, while others estimate that bio-prospectors can increase trials from one in 10,000 to one in two, by consulting indigenous peoples (Pradesh 1999). Another, rather famous example of the value of indigenous knowledge concerns the climatic knowledge of the Masai pastoralists, which has enabled them to foresee and act upon major droughts long before researchers and officials who employ modern state-of-the-art remote sensing technology (Moris and Copestake 1993). Such examples are very impressive, but how can it be that indigenous peoples know so much about the environment they inhabit? How do they learn, and on what does their learning depend? It is questions like these that sparked my interest in undertaking the research leading to this dissertation.

The literature explaining the extent and character of this type of knowledge falls largely into two fields. Most authors agree that the creation and extent of this knowledge is related to people's productive activities and their location. However, some authors take it a step further. They argue that place and human action do not fully explain how knowledge is generated and, not least, maintained. People's cultural models provide the framework for their learning experiences. These are then reflected upon and tried out within culturally shaped institutions and form a basis for their productive and reproductive strategies and practices. This dissertation explores both viewpoints.

However, it is also well known that the contexts within which this knowledge is produced and maintained are under pressure in large parts of the world. The continuous expansion of the agricultural frontier into forest areas is only one of many points of contact between modern and other ways of life and production. The question is how indigenous knowledge systems are affected along processes of societal and technological change.

This study addresses the production and reproduction of indigenous peoples' knowledge systems, particularly when they are related to biological diversity. The conceptual concern is the relationship between the generation, maintenance and change of such bodies and systems of knowledge and livelihood strategies. The

main analyses are based on a total of seven months of fieldwork<sup>1</sup> in Colombia among the Muinane and Uitoto peoples of Northwestern Amazon. My aim is to feed into the on-going political struggle concerning rights of access to and use and conservation of biological diversity and associated knowledge, by contributing to the understanding of the relationship between living and knowing.

What are the political potentials of this knowledge and thus of the livelihoods of indigenous peoples? Several processes since the mid-1980s have placed the resolution of the conflicts regarding biological diversity on the global agenda. The most important processes were driven, on one hand, by the increased knowledge of and concern with environmental destruction, and the awareness among large NGOs and intergovernmental bodies of their failure to counter this destruction effectively. On the other hand, the development of new technologies that enabled relatively fast screening procedures of potentially valuable biological elements increased the interest of industry and governments. Also, strengthened organisations for indigenous peoples from, among other places, Latin America and Greenland, have to some degree managed to draw the attention of international fora to the local conditions upon which the conservation of biodiversity and the development of associated knowledge rely. By stressing the importance of the link between their livelihood strategies and their ancestral knowledge systems and pointing out its positive effect on past, present, and future use and conservation of biodiversity, indigenous peoples' organisations have demonstrated their ability to engage in cultural politics.

My study is motivated by two main concerns:

*First*, indigenous peoples' struggle depends largely upon their knowledge of plants and their continued access to biological diversity.

*Second*, tropical biological diversity and its conservation relate to indigenous peoples' livelihood strategies and their development.

Thus, in this study I examine how is indigenous peoples' knowledge related to livelihood strategies, cultural practices and territory, and analyse how indigenous peoples' knowledge on biodiversity is related to place and culture. This involves a research interest in how knowledge production is affected when place and culture are under stress.

The dissertation is organised as follows:

In the first chapter, I introduce the reader to the complex and contested field of biodiversity. The aim is to understand the socio-political landscape in which indigenous peoples' organisations move, and the actual and potential role of their knowledge in global strategies for the conservation and use of biodiversity. The major actors and negotiating fora are presented to illustrate and analyse the

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<sup>1</sup> Periods of 2-6 weeks spread over the agricultural year between May 1995 and March 1998.

contradictions and diverging interests, their discourses and power. This is followed by a discussion of the motives for merging these and the development of new strategic alliances. The analysis of the political setting produces questions of an empirical and conceptual nature concerning the relevance of the ways in which knowledge and knowledge production are commonly seen; of the importance of social and cultural dimensions for the production of knowledge; and of knowledge-producing systems' resilience under massive social changes.

In the second chapter, I am concerned with ways of understanding and dealing with the conceptual questions concerning the dynamic character of knowledge production in relation to biological diversity and the linkages to social, cultural, political and biophysical dimensions of context. The chapter falls in two parts:

In the first part, I examine a debate that has contributed substantially to the way we understand knowledge production today, not least concerning biological diversity. The debate has resulted in the construction and politicisation of a body of 'non-scientific' knowledge.

The analysis departs from a critique of the positivist notion of knowledge production as objective, universal, and free of influence from special interests, and continues by discussing the arguments and motives of the authors and practitioners who propose the division between local and scientific knowledge and its making.

In the second part of the chapter, I focus on central aspects of the contextual character of the making and keeping of knowledge. Knowledge production depends upon sets of knowledge processes. I set out by drawing on discussions of both mental and relational processes, with a particular focus on reflection, negotiation, and interaction. The analysis of central processes leading to the production of knowledge is taken further by exploring the relevance and character of so-called knowledge institutions, seen as frameworks of shared meanings institutionalising, promoting, and refining learning processes and capacities.

A five-step research strategy is developed in chapter three. A set of research techniques inspired by constructionist inquiry, geographical mapping, and ethno-biological methodology are employed and developed to understand, deconstruct and correlate social, cultural and biological dimensions of the production of knowledge on biological diversity.

Chapters four and five are the empirical accounts. In chapter four, I address how biophysical conditions and the social organisation of production contribute to the shaping of people's knowledge on biological diversity. In chapter five, I focus on the culture-specific processes of "evacuating" knowledge among the Muinane and Uitoto people, and explore the relevance of people's participation in cultural institutions for the social distribution of knowledge on plant diversity.

In chapter six I step back and draw overall conceptual and political conclusions concerning the relationship between the making of indigenous people's knowledge on biological diversity and the ways in which people live.

## **CHAPTER 1**

### **POLITICAL, ECONOMIC AND ETHICAL DIMENSIONS OF BIODIVERSITY**

#### **New situation of strategic alliances, new types of conflicts, and new political space**

This chapter discusses the current and historical political, economic and ethical dimensions of the question of indigenous peoples' knowledge, use and conservation of biodiversity.

The term, biodiversity, generally creates associations of peaceful landscapes, leisure time, exotic animals, beautiful plants and so on. It is a 'plus-word', full of positive connotations. Although for some people biodiversity also raises concerns about the loss of valuable resources, it does not present itself as the highly contested question it actually is. Actors interested in using, conserving and benefiting economically from biodiversity are directly or indirectly involved in struggles to agree about the rights to access and/or to ownership of biodiversity and associated knowledge. Text box 1.1 presents a comparison of and brief comments on a few central quotations that describe the positions of some of the key actors in the ongoing negotiations and some of the results. The text fragments reveal the lines of tension and conflicting voices in the disputes and negotiations within this area. The conflicts over rights to knowledge and rights to plant genetic material are certainly among the most heated issues concerning use and conservation of biological diversity. During the 1990s, indigenous peoples' organisations have placed much emphasis on this debate, as it relates to rights to particular ways of life, including places, natural resources and knowledge. During this period, the apparently irreconcilable gap between indigenous peoples' understanding of common property rights to biodiversity and associated knowledge, on the one hand, and the demands of the biotechnological industry for universal intellectual property rights based on patents, on the other,<sup>2</sup> has become a point on the international agenda. The legally binding and potentially heavily sanctioned GATT-TRIP Treaty on Trade Related Intellectual Property Rights, which serves as a foundation for the

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<sup>2</sup> As expressed by the US delegation to the CBD and WTO.

World Trade Organisation (WTO),<sup>3</sup> demonstrates all too well that indigenous peoples' organisations are up against powerful actors. However, rather surprisingly, the quotes in text box 1.1 also indicate an unimpressed attitude among indigenous peoples' organisations when they raise their own voices in defence. Feeling the pressure exerted and interventions made by so-called 'gene hunters' and others, they move in and out of changing strategic alliances with non-governmental and governmental organisations and manage to enact a sort of 'cultural politics' that stretches into national and international legislation (Escobar 1998; Kronik 1993). The text fragments in text box 1.1 also show that by the end of the 1980s indigenous peoples' organisations were discontent with the environmental movement and were feeling misrepresented and ignored in their discourses on issues of biodiversity.

This chapter introduces the reader to the complex and contested field of biodiversity. The contradictions and divergent interests, their discourses and power, are illustrated and analysed. The aim is to understand the socio-political landscape in which indigenous peoples' organisations move, and the potential role of their knowledge for the conservation and use of biodiversity. This is not an attempt to make an objective description, which is hardly possible, but rather to explore and demonstrate how the concept was born out of an increasingly politicised environment. To accomplish this, I analyse the two central historical processes regarding use, conservation of and control over global biological diversity:

- First, the issues dealt with by the so-called nature conservationists and their motives and strategies. They have focused mainly on the conservation of wild life and natural habitats.
- Second, the field of conservation of domesticated and non-domesticated plant genetic resources.

Crucial to both of the debates is increasing anxiety over the apparent failure to defend current and future biological diversity against the negative impact of man's hitherto unprecedented use of the biophysical environment. I wish to illuminate part of the story about the failure within the two historical discourses on nature conservancy and the use and conservation of plant genetic resources to deal with certain issues and conflicts while excluding key stakeholders, such as representatives for both industry and indigenous peoples. The anxiety and inefficiency of the measures taken, coupled with a tendency to increase commercial interests and raise environmental awareness, have jointly contributed to the merging of the two debates that have introduced the concept of biodiversity.

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<sup>3</sup> Article 27, in particular, article 27.3 (b).

*Text box 1.1: Key quotes regarding positions and conflicts in the arena of biodiversity*

<p><i>“There is no such thing as communal rights”, a US delegate proclaimed at the Conference of Parties to the UN Convention of Biological Diversity (CBD-COP) plenary session in Leipzig, 1996. He was addressing indigenous movement representatives and NGOs and referring to the negotiations concerning legal rights to biological material and knowledge. The US delegation hereby demonstrated how they support i.a. the pharmaceutical industry in their demand for a universal intellectual property rights regime based on patents.</i></p> <p><i>“... Parties shall provide for the protection of plant varieties either by patents or by an effective sui generis system...” GATT-TRIP Treaty, art. 27.3(b). 1995. The Trade Related Intellectual Property Rights (TRIPs) agreement hereby obliges parties (almost all countries) to protect the rights of commercial breeders and biotechnologists and their companies, and to ensure that they can claim and receive royalties for new seeds through patents or Plant Breeder rights</i></p>	<p><i>“Recognising the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.” UN Convention of Biological Diversity (CBD), §15.1 on genetic resources. 1992.</i></p>	<p><i>“We are concerned...that the Amazonian peoples... have been left out of the environmentalists’ vision of the Amazonian Biosphere. The focus of concern of the environmental community has typically been the preservation of the tropical forests and its plant and animal inhabitants. Little concern has been shown for its human inhabitants who are also part of that biosphere.” COICA, 1989 (The Coordinating body for Indigenous Peoples’ Organisations of the Amazon); cf. Gray 1991.</i></p> <p><i>“They steal our holy plants, our blood and our knowledge, only for the sake of profit” 1999.</i></p> <p><i>Far from the corridors of top diplomacy, Ecuadorian indigenous peoples’ organisations mobilise to stop access by ‘gene-hunters’ to plant genetic resources, while a US-based pharmaceutical company tries to patent their holy plant “Ayahuasca”...</i></p>	<p><i>“Each Contracting Party shall, as far as possible and as appropriate: Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote wider application with the approval and involvement of holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices.”</i></p> <p><i>CBD§8j on In situ Conservation. 1992.</i></p>
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Therefore, I will discuss the motives for merging the two processes further with departure in two recent and central fora in this respect: The National Fora for BioDiversity held in Washington DC in 1986, and the Keystone Dialogue held with plenary sessions at the Keystone Centre in Colorado in 1988, Madras in 1990, and Oslo in 1991. Both of these preceded the Convention on Biological Diversity (CBD) and had significant impact upon its very existence and its content. Understanding these motives facilitates a discussion of the development of new strategies and mechanisms and helps explain how relevant, but so far neglected, actors managed to enter the debate during the Keystone Dialogue, and through this were able to influence the Biodiversity Convention and the TRIPs agreement.

Finally, the visions and strategies of the indigenous peoples' movement in this political struggle are presented and their lines of argument critically discussed. Unlike earlier or other discourses formulated by indigenous peoples' organisations and supporting actors, which are often based on ethical concerns, the recent line of argument is based on the creation and proprietorship in relation to specific valuable knowledge. The processes leading to the creation of such knowledge are embedded in so-called traditional lifestyles (see text box 1.1, CBD § 8j). The argument continues that these particular lifestyles rest upon certain cultural and biophysical circumstances, so that if these are threatened, the processes necessary for the maintenance and development of such "knowledge, innovations and practices" (CBD 8j) will also be threatened.

According to the official clearing house mechanism of the Convention on Biological Diversity,<sup>4</sup> these links "*between conservation of biological diversity and cultural diversity, and the dependence of such communities and the continuation of their traditional access to biological resources*" are now recognised. This prompts me to inquire into the character of such "knowledge, innovations and practices", the links, and the societal conditions upon which they seemingly depend. I am particularly interested in the role of processes of social change.

## **Introducing "biodiversity"**

Today, "biodiversity" is a well-known concept both to the general public and to popular institutions, to the press, politicians and bureaucrats. Kids learn about it in school and so on. Often, biodiversity is referred to as something valuable and worthy of protection, and each year, large sums of money are spent to keep it that way. By definition, it covers the multitude and complexity of micro-organisms,

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<sup>4</sup> [www.biodiv.org/indig/](http://www.biodiv.org/indig/)



genes, species and ecosystems. Yet biodiversity is a rather recent concept. The concept of biodiversity is known among specialists to have emerged from a conference held in Washington in 1986. Sponsored by the politically powerful institutions of the National Research Council's Commission on Life Sciences and the Smithsonian Institute,<sup>5</sup> the conference featured more than 60 leading biologists, economists, agricultural experts, philosophers, representatives of assistance and lending agencies among its professional participants. At the National Forum on Biodiversity, an effort was made to examine all the facets of the issue. The presentations ranged from estimates of the state of biodiversity, its value, our dependency on it, and the political, economic and scientific challenges we are presented with in seeking to conserve it. All 60 scholars stressed the importance of biodiversity and the need to maintain it, and they agreed that the greatest threat to this goal comes from human activity.

The intentions of launching this new concept were to address genetic erosion and loss of biological diversity through co-ordinated regulation and conservation. But why was there a need to meet these concerns in a new way, spearheaded by a fresh concept and backed by powerful players? Why not simply continue within the realm of the institutions already dealing with different aspects of the problem? Certainly, the rates of deforestation increased during the 1980s, and the loss of and threat to the diversity of living organisms increased historically with developmentalism – but the situation did not differ essentially from the 1950s, the 1960s or the 1970s. So what made the difference?

During the 1980s, there was a growing concern and some sense of desperation among key players working for the conservation of biodiversity, such as IUCN, FAO, WWF, UNEP and WRI. They were increasingly aware of the fact that each of their separate efforts had limited impact on the problems of mass extinction at both the genetic and species levels. Contributing to this awareness was also the fact that enough data was being gathered during this period to make an overall assessment of the so-called extinction crisis. The picture was not a merry one (see text box 1.3).

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<sup>5</sup> A national research foundation (USA) that is also the world's largest museum complex.

*Text box 1.2: Character and importance of the diversity of the living*

*The immense and incomplete estimates of the value of biological diversity*

The value of the earth's biological diversity – its ecosystems, species and genes – can hardly be overestimated. It is recognised as a source of spiritual, aesthetic, recreational and economic values. One may ask whether it makes sense to even try to estimate the values in monetary terms. Some argue that not knowing the economic benefit arising from biodiversity contributes to its degradation, since for example national economic systems and policies fail to value the environment and its resources adequately (Zedan 1995: ix). The direct past, present and future benefits of biodiversity are truly impressive. Encompassing every form of life, biodiversity comprises the variety and variability of all plants, animals and micro-organisms, and the ecological complexes of which they are part. It supplies all our food, much of our raw materials and energy, and many of our medicines. The tropical forests, for example, important as they are for much the earth's biodiversity, provide us with an endless list of products. Fruits, honey, medicinal products and timber are but a few examples, and many new products reach the world market, which promotes increasing interest from consumers. In addition to timber products, over 150 products are sold internationally with an annual value of more than 10 billion USD. On top of this comes the even more important local and national trade (Prebble 1999). Other, more indirect, benefits are less known but just as important, considering their importance to the world's ecosystems and not least to humanity. Fjeldsaa and Rahbek (1999) give a few examples of the services provided by a rich biological diversity. One example is the estimated monetary value of the activities of insects to agriculture and fruit plantations: It should amount to 417 billion USD for pollination and 17 trillion USD (US\$17,000,000,-000,000!) for nutrient cycling. These figures have been published in one of the most prestigious scientific journals, *Nature*. However, these figures cannot be more than rough estimates, since they calculate the cost of having to do the job of insects by applying biocides and fertilisers. But astronomical as they are, these figures help us understand the extent of the "resource" (Constanza et al. 1997). Furthermore, there is a proven positive correlation between the complexity of species composition and both drought resistance and nutrient cycling (Tilman et al. 1996). It also helps to lower the effect of fluctuations in the physical environment. Species-poor cultural landscapes are vulnerable and often demand irrigation, fertilising etc. In many areas, water quality is related to the ability to ensure complex natural vegetation (Maltby 1986; Gash et al. 1996).

Until recently, it has been almost forgotten that the biologically diverse places that maintain and shelter complex species compositions have been inhabited by people who in their daily lives benefit from, learn about and have an impact on the ecological composition of nature. These people, however, are increasingly making their presence heard and seen to public opinion in general and to powerful actors in particular.

*Text box 1.3: Threatened sites of importance to biodiversity*

In response to the new awareness of loss of biodiversity, attention was directed towards the sites where important biodiversity is found. The criteria by which biological diversity was ranked varied and still do. In developing strategies for use and conservation of plant diversity, the discussions have largely been divided into two fora, one discussing agro-biodiversity and the second discussing non-agro-biodiversity. There are several overlaps. Not least of these concerns tropical forests, where practices in the closed forest can be closely connected to those of the more intensive sites of production, such as the bringing in of seeds, tubers, and conversely, the gradual de-intensification of the productive areas where forest fields are turned into humanised forests. Agro-biodiversity is conserved according to location. *In situ* conservation aims at conserving the plant at the place where it grows naturally or is cultivated. *Ex situ* conservation takes the plant to a central place, like a botanical garden or an agricultural research centre. Both techniques have their strengths and weaknesses, and these are dealt with elsewhere in more detail. *Ex situ* conservation strategies are developed to avoid the threat of losing genetic material due, for example, to loss of environmental and other conditions. However, it is argued that *ex situ* conservation gradually causes the plants to lose their special context-bound resistance and other properties by removing them from their cultural and natural habitat.

Early conservationist approaches were influenced by European and North American groups of colonial hunters who valued a few kinds of large animals, referred as 'the big-five type of animals'. During recent decades, powerful Northern NGOs like Conservation International have pointed out the values of the so-called hotspots (with very large numbers of species/area unit). Fjeldså and Rahbek criticise the hotspot approach, arguing that conservation efforts should rather be targeted to protect the most endangered of the most seldom, endemic, and specialised species – those encountering the so-called extinction crisis. They claim that the extinction rate is 1000 times the 'natural' rate. Only few of the important threatened species are found in the proclaimed hotspots (1999: 50). However, the proposed conservation strategy is also a hotspot-like preservationist one – only with other criteria. If we move away from 'wild diversity' to 'production-related diversity', the loss of genetic diversity within species occurs at an even faster pace than species extinction. Traditional food plants and local races of staple crops are being abandoned and lost forever in favour of newly developed ones (Zedan 1995: xii).

During the last millennia, people have sought places that were particularly interesting because of the probability of finding healing herbs etc. This has recently increased dramatically. Pharmaceutical companies, ethno-pharmacologists and others seek, collect, and examine a wide variety of plants, and make this their criteria for choosing sites to explore. Sometimes (although rarely) they encourage their conservation. Most of these areas are found in the species-rich highlands and

lowland tropical forests located along the equatorial belt. For example, it is claimed that 70 percent of the plants containing cancer-mitigating substances originate from the low tropical forests (Hecht and Coburn 1989: 61).

The tropical forests are disappearing at an alarming rate in recent decades. FAO estimates that the annual loss of forests from 1990 to 1995 was 3.7 million ha. in Africa, 3.1 million ha. in Asia, and 5.7 million ha. in South America (FAO 1997). The World Resources Institute estimates that 450 million ha. of tropical forests have disappeared on a global scale since 1960. This corresponds to one-third of Asia's forests and one-fifth of both South America's and Africa's forests (WRI 1997).

The varying opposing actors and production patterns continued their destructive activities largely unhindered. Therefore, launching the new concept did not initiate a new field of action, since dedicated people and institutions were already dealing with all the elements of the concept (genes, species and ecosystems).<sup>6</sup> They were, however, dealing with them separately and with a lack of coordination. The initiative was more likely a political manoeuvre carried out to join forces against powerful new and existing conflicting interests. The aim of the conference was thus to foster a new alliance of scientific, governmental and commercial forces for international conservation, and thus to reshape the international conservation movement in the decades to come (Wilson 1988).

Before going further, a brief historical analysis and presentation of the principal actors involved before the Washington meeting is necessary. To understand some of the structural discontinuities produced by the meetings between these actors and other stakeholders, we need to know more about not only the types of actors, but also how they were discussing and acting upon these issues.

## **How biodiversity was dealt with and by whom in the 20th century**

Two parallel but, until recently, only sporadically connected historical processes stand out and need to be analysed in order to explain what the term biodiversity is meant to capture and which aspects were introduced or left out. These processes also serve to shed light on the rationale of several of the present key actors. These are:

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<sup>6</sup> As we shall see, their efforts were often partial, not always the most efficient, and the cultural dimension was most often handled as an 'add-on'. However, it is not primarily these flaws that led to the unification of these fields of action.

1. The ethical conservationist motivation, mainly debated within nature conservation fora
2. The utilitarian agricultural motivation, mainly discussed in connection with plant genetic resources.

### Nature conservation

The first nature conservation agencies and organisations were established around the beginning of the twentieth century. These national and non-governmental entities were created as a reaction to the changes in the physical landscape resulting from industrialisation. Their aim was to preserve natural habitats of landscape or cultural value from exploitation. By mid-1900, these national-level efforts were sought strengthened internationally by forming the IUPN (1948), the International Union for Protection of Nature (later IUCN),<sup>7</sup> which was to focus on research and communication. Critics within the organisation felt a need to be more action-oriented and broke with IUCN in 1961 to establish WWF. However, they remained in close partnership, filling different roles but pursuing more or less the same target. This cannot be said about the relations between the conservationist organisations and development institutions such as the UN Food and Agriculture Organisation, FAO. One example is when the Organisation for African Union asked IUCN to develop a convention to deal with both needs for conservation and development, assisted by FAO and UNESCO. The three institutions disagreed fundamentally in terms of objectives, priorities, and strategies. FAO argued that IUCN failed to consider the need of African people for development by neglecting to view wild species as sources of food. They accused IUCN of solely addressing aesthetic and scientific concerns (Boardman 1981; cf. Carstensen 1988).

Until the late 1970s, both IUCN and WWF favoured establishing national parks as a key strategy to protect wildlife and their habitats from “*destructive human activities*” (Myers 1984). All production and other ‘harmful activities’ were abolished and access was to be highly regulated. In a much-cited study for the World Bank on wildlands, Ledec and Goodman ranked the available conservation strategies relevant to wildland diversity (i.e. not domesticated plants or animals). *In situ* conservation strategies with access limited to scientists scored highest (Ledec and Goodman 1988: 17; cf. Jensen and Kronik 1999). While this may be the case in certain places, in others it has diminished biodiversity. In the case of one of the oldest national parks in the world, Kruger National Park in South Africa, all people were cleared out when the park was founded. Subsequently, the park was managed to favour certain species (making waterholes etc.). The species composition became homogenised, while living conditions disappeared for other species,

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<sup>7</sup> Since 1956 known as IUCN, International Union for Conservation of Nature.

such as different antelopes (Kennedy 1999). Thus, human action, as well as 'inaction', affects the character of the biological diversity within an area.

The "fencing/policing and management strategy" has created a series of conflicts with the original users of these areas, and also among different interest groups within the conservation movement. The internal dispute was largely between actors with predominantly aesthetic motivation versus those with a predominantly 'natural-historical' motivation. Aesthetic motives include both scenic and emotional aspects. Actors emphasising recreation values and wild life conservation fall into this category. Some are characterised by a romantic search for purity, loneliness, outstanding beauty etc. (Carstensen 1988).

The motives shaped by natural-historical ideas were originally influenced by a romantic glorification, on the one hand, of the completeness, variation and abundance of nature, and on the other, of its original and unique manifestations. In a natural historical-biological context, this comes through, also today, as a strong interest in inter- and intra-species variation, particularly in relation to the most seldom and/or evolutionary unique species (Carstensen 1988 p.117).

Although both organisations still advocate different models of restricted access to biologically high-value areas, a shift began during the late 1970s and the early 1980s. Issues such as the societal benefits from protecting and maintaining these areas became more common (McNeely and Miller 1984), which, not without conflicts, added the cultural dimension to the emotional/aesthetic and scientific motives (Carstensen 1988: 172). Both in the milestone report, "World Conservation Strategy", from 1980, and at the World Congress on National Parks and Protected Areas in Bali in 1982, development was now to an increasing extent sought integrated with conservation. I see two major reasons for this shift.

1. There was an increasing awareness that society was not only putting the conditions for nature's reproduction at risk through its activities, but also undermining its future natural resources.
2. Conservationists were having increasing difficulties defending their park strategy of areas completely isolated from human activities, both physically and on moral grounds.

The first reason provided the conservationist actors with a strong line of argument that has been predominant ever since. Nature was redefined as a set of resources, and the conservation of nature was seen, when done rightly, as an important element within the management of nature necessary in order to secure the survival of humanity. In this way, the conservationist organisations brought themselves closer to development institutions like FAO. This had implications for further collaboration, both in the area of nature conservation and the area of conserving plant genetic resources. The redefinition of nature as natural resources linked environment to development, still stressing however the negative effects of development on the state of the environment (IUCN/UNEP/WWF/FAO/UNESCO 1980). People

living in or around areas that had been selected for conservation for biological reasons only were still often seen as destructors of nature. Therefore, the second reason was generally met with a series of mainly methodological discussions, policies and activities: development of buffer zones, testing of so-called sustainable production. These only rarely built upon these people's experiences or addressed the underlying societal reasons for the overexploitation of natural resources.

### **Plant genetic resources**

One of the important issues dealt with under the biodiversity umbrella is plant genetic resources. However, the state, ownership, utilisation and conservation of plant genetic resources did not become a global issue overnight. Traditionally, this was an issue dealt with only in the agricultural debate. Later, with technological innovation, it has also become a major issue among actors involved in the pharmaceutical business.

The objective of the actors concerned with plant genetic resources, both historically and currently, is to secure as broad a genetic base as possible within relevant species. Modern agriculture tends to focus on the intra-species variation of a few major crops in order to enhance food security. To some extent, wild and weedy relatives are included in the collections. Pharmaceutical companies have a much wider scope. They look for the active components in both cultural and other plants and other biological material.

The principal actors working on plant genetic resources are, in addition to farmers, the private, national and international agricultural research centres (among them the Consultative Group on International Agricultural Research, CGIAR), the Technical Advisory Committee to the CGIAR, TAC, the Food and Agriculture Organisation, FAO, and a handful of public and private donors like Rockefeller, Ford and Kelloggs Foundations, and the biotechnological industry.

At the beginning of the century, a growing awareness emerged of the importance of plant genetic resources and of the failure to protect them (see text box 1.3). Although it is still being discussed how and where hunters and gatherers started planting seed, tubers and roots, thereby starting the first agricultural revolution, the outcome of early farmers' efforts cannot be disputed (Hobhouse 1985; McCorrison and Hole 1991, cited from Rhoades and Nazarea 1999). The historic tendency for pre-industrial agricultural communities has been to foster and increase landrace diversity rather than decrease it (Harlan 1995).

As long ago as 8 to 12 thousand years, 'primitive' farmers had already successfully experimented with invading wild 'weedy' species in their settlement clearings and had domesticated the first crops (Harlan 1975). Through local knowledge, people have historically domesticated approximately 7,000 plant species.

The results of local knowledge-based management of the gene pool serve as components for further scientific breeding. Today, the 20 most cultivated plants currently supply the world with 90 percent of its food. Of this, wheat, rice and maize (Zedan 1995) supply over half. Not only did prehistoric cultivators give humanity the major food crops and animals which nourish us today. They simultaneously created their own specialised knowledge systems about the food, fiber and medicinal values of thousands of plant and animal species (Schery 1972; Fowler and Mooney 1990). This also serves to illustrate the importance of local mechanisms for *in situ* conservation based on high quality knowledge systems. However, the current focus on a narrow selection of crops is also indicative of the vulnerability of the world's food supply, especially if it stems from a narrow genetic base. The genetic base of these food staples is generally very narrow. For instance, the entire Canadian prairie is cultivated with only one variety of wheat, and the entire soybean industry is based on only six plants. The most catastrophic example of vulnerability and exposure to pests with a narrow genetic base is the potato crop failure in mid-19th century Europe due to the late blight, a fungus most likely introduced from the Americas. Most of Europe had come to depend on a few varieties; in Ireland, there was total dependence on a single variety.

The strategies embarked upon were collecting, describing and conserving varieties of major crops in what became known as *ex situ* conservation, i.e. removed from their natural habitat. These include botanical gardens and zoo's for the conservation of whole organisms and various types of 'banks' to store 'organism parts'. The *ex situ* banks most relevant to the conservation of plants and plant genetic diversity are seed, pollen, and gene banks. The collected varieties were historically meant for breeding and distribution purposes. De Candolle (1885; cf. Rhoades and Nazarea 1999) and later Vavilov (1926, 1949; cf. Rhoades and Nazarea 1999) were the first to observe that the density of inter- and intra-specific variation of crop species was found in "centres of domestication". These tend to be in the ecologically complex mountainous regions or areas of marked dry-wet seasons in Africa, Asia, and Latin America (Rhoades and Thompson 1975; see also text box 1.4).

*Text box 1.4: Historical inter-dependency between human society and plant genetic resources*

"Due to a variety of causes, major ancient civilisations – such as the Andean, Mesopotamian, Mesoamerican, Indus, and Chinese – evolved near these centers of domestication in close association with diverse plants and animals. In complex ecological settings under conditions of human population expansion, the co-evolution of human culture and plant populations led to a level of people-plant interdependency so high that some modern crops – such as maize – cannot reproduce themselves without purposeful human intervention (Iltis 1987). The historical and ethnographic records are rich with data on how cultural knowledge intertwines with the biological to a degree they cannot be separated and still



maintain dynamic evolutionary-ecological systems (Nazarea 1998). This detailed knowledge not only focused on production but also storage, processing, cooking, and utilisation qualities needed for the survival and rejuvenation of crops and humans (Nazarea-Sandoval 1992). As a result, domesticated crops can be understood as culturally created and conceived human artefacts – valued for qualities such as utility, taste, color, shape and symbolism (Zimmerer 1991)” (Rhoades and Nazarea 1999).

During the 1960s and 1970s, the effort to collect plant genetic material for the most important food staples was drastically increased. It was increasingly organised internationally by the formation of international agricultural research centres that comprised the so-called CGIAR. At first, it was facilitated by sponsors like the Rockefeller Foundation but soon after taken over by a donor community dominated by countries of the North.

*Ex situ* conservation ensures control over access (public and private domain) to genetic resources for breeding and biotechnological research and for marketing and other types of distribution. *Ex situ* conservation has its benefits but also its limits.<sup>8</sup> As argued by Iltis (cf Rhoades and Nazarea 1999), David Wood (1993) and others, the properties of certain plants need a particular environment with continuous human and bio-physically induced disturbances in order to maintain and develop such properties (such as drought resistance etc.). An increasingly recognised problem with *ex situ* conservation is the loss of information and knowledge about the services provided by, for instance, a collected plant. These services may be utilitarian, ecological or otherwise. During the last few years, the documentational approach has been refined by actors such as the international plant genetic research institute, IPGRI, and others who promote the collection of so-called passport data, such as place of origin/collection, eventual local names, use categories etc. While such data are useful in order to obtain an overview of where the plant genetic material is situated, how widely spread it is, where centres of high/low diversity are, and maybe even where centres of origin are located, such approaches are limited and should not stand alone. First of all, much current and potentially relevant information is not collected.<sup>9</sup> Secondly, much information is not yet understood and therefore not asked for. And thirdly, the tremendous task and the high costs of the *ex situ* conservation technology involved in carrying out this work means that only a very limited selection of highly diverse environments can be expected to be collected. On the other hand, there are many critical voices

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<sup>8</sup> I will mention a few and refer to Pistorius (1997) for a more detailed list of the pro's and con's of *in* and *ex situ* conservation strategies.

<sup>9</sup> It simply does not fit the blueprint information gathering systems.

concerning the lack of quality control of the resources conserved *in situ* and concern about the loss of control over access.

Vavilov's centres of domestication<sup>10</sup> were used as a "genetic treasure map" in many European and American conservation efforts (Pistorius 1997). Technological advances, both within plant breeding and with the rise of biotechnology, urged increased collecting. However, surprisingly little interest has been paid to *in situ* conservation mechanisms.

*In situ* conservation strategies were (re-)introduced into the debate, fuelling both the disputes over property rights to plant genetic resources and associated knowledge and the appropriateness of the preference for *ex situ* conservation mechanisms among strong actors (agricultural research centres and the donor community).

### **From the issues of nature conservation and genetic resources to the concept of biodiversity**

The most noticeable development within the issues of nature conservation and plant genetic resources in the 1980s was their politicisation. The economic prospects of using biodiversity were facilitated by the recent technological advances, causing a shift in the attention and understanding of biodiversity from a largely unrecognised and little understood common good with aesthetic value, to a highly desired resource. Governments and other actors started discussing issues such as intellectual and other kinds of property rights, as well as the terms for access to plants and associated knowledge. These issues have strong North/South dimensions, which are fuelled by the fact that plant suppliers were mostly countries in the South, whereas users and gene banks were mostly found in or controlled by the North. The debate largely took place within FAO.

The first mention of a legal convention of plant genetic resources was at the 21st FAO conference in 1981. Some developing countries pushed for it to be within the framework of FAO, which implied, according to Pistorius, that FAO would gain legal control over the exchange and distribution of genetic resources in the CGIAR network. However, this was strongly opposed by leading developed countries (mainly USA, UK, and Australia). They preferred a donor-controlled CGIAR. This event opened formal procedures for the worldwide exchange and distribution of genetic resources (Pistorius 1997). Several Northern actors felt uncomfortable with the apparently unfavourable North-South balance within FAO and wished a shift to another forum or a new international body (personal communication during PrepCom4, UNCED; see also Mooney 1996).

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<sup>10</sup> Also referred to as centres of diversity (Pistorius 1997) or centres of origin (Vavilov).

Biotechnology, which is a set of technologies that open new possibilities for the directed manipulation of genetic materials, enhances at least potentially the value of genetic diversity. Pharmaceutical and agro-industrial companies invest massive sums to develop these new methods which allow them to screen large quantities of plant genetic resources for potentially useful active components. Such technological developments, which rapidly intensified during and following the 1980s, represent changes in relationships among actors and form the framework for conflicts and redefinition of rights and relationships. The fact that biotechnology only requires a one-time context-specific input (like a DNA string) and is not dependent upon raw material (like iron, glass etc.) means that biotechnology varies essentially from other technologies concerning access and control (Fowler 1994). In 1988, Jack Kloppenburg showed the inter-relatedness of the use of intellectual property rights issues and the development of advanced breeding and biotechnology, calling it the commoditisation of the use of genetic resources. Commercial actors entered the arena wishing to secure their profits and research expenditures. They aimed to extend American property rights regimes through global patenting, and back them up with efficient sanction mechanisms. These actors have had an indisputable influence on how biodiversity is handled today, with all the institution building and bridging of issues involved.<sup>11</sup>

Research on plant genetic resources has helped feed growing urban populations, but it has been seriously criticised of its failure to reach the poorest farmers, since the new technologies demand investments to modify the landscape and finance high levels of inputs. Another serious criticism is the impact upon local plant genetic resources of substituting thousands of varieties with a few modern high-yielding varieties. Together with the environmental impact from increased irrigation and the use of chemicals etc. this fatal loss has contributed to the environmentalisation and politicisation of the plant genetic resources issue, fostering new alliances of NGOs, farmers, some national governments and international institutions. It has also contributed to emphasising *in situ* conservation strategies. Institutions like IUCN, UNEP, WWF and WRI began to get involved in the plant genetic issue, not from the agricultural perspective of FAO and CGIAR, however, but from an environmental perspective. This coincided in time and theme with the UN Brundtland Commission (WCED 1987). In 1989, the General Assembly of the UN agreed upon the scope and procedure for establishing legal instruments suitable and able to regulate future use and conservation and resolve relevant conflicts, and initiated the subsequent preparatory phases leading to the Convention on Biological Diversity at UNCED in RIO.

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<sup>11</sup> Industry lobbies the US delegation to the UN intensively.

## **Actors reacting to new potentials in environmentalisation of the biodiversity issue**

Several actors and fora contributed to establishing the agenda for how biodiversity was to be discussed, and to choosing which actors should deal primarily with which issues. International conservationist and utilitarian organisations played important roles historically, but the process accelerated significantly once the two aforementioned approaches were merged and co-ordinated contact was made with other actors. These include: pharmaceutical companies; NGOs (RAFI, GRAIN, WRI); multilateral or intergovernmental institutions (like IUCN, UNEP and FAO); and to some extent popular movements. A milestone in this process of negotiation was the so-called Keystone Dialogue. The central issues involved were the control over genetic resources; connecting the property rights issue with the global issue of conservation; the exchange and use of plant genetic resources; and a shift from the “free access regime” to a system regulated by the state. Worth mentioning are also the World Resources International, WRI, IUCN, and UNEP. These institutions joined forces to develop the World Conservation Strategy (IUCN/UNEP/WWF 1982) and the Global Biodiversity Strategy (WRI/IUCN/UNEP 1992). In this way, they contributed to the environmentalisation of the plant genetic resources issue and the merging of aesthetic and natural historical motives for conservation with societal motives within the nature conservancy discourse.

## **New interests and new players on the scene**

During the late 1980s, utilitarian and ethical motives for the conservation of biodiversity were being merged. Conservationist and broader environmental or developmental institutions began to develop common objectives, policies, strategies, and concrete actions (WCED 1987; Reid and Miller 1989; and WRI, IUCN, UNEP 1990). Other actors, such as indigenous peoples’ organisations, industry, academics etc., published their concerns in response to these efforts. They raised issues such as intellectual and other kinds of property rights, benefit sharing, cultural diversity, and local knowledge. The structure of the international arena was changing and new legal instruments saw the light of day.

One of the major results of this process, according to Fowler, is the new space for negotiation that was then being developed, where adversaries could share at least one goal – a successful resolution of the conflict (Fowler 1995). However, to get this far, all relevant stakeholders must realise that they have something to gain from such negotiations in order to enter them constructively, or to even wish to enter them at all. The process has indeed come a long way. But to judge from such popular protests as those at the WTO meeting in Seattle in 1999, and the hundreds of thousands of Indian farmers protesting against the patenting of certain cultural

plants, these mechanisms are still far from global in scope. The central consensus-building effort to outline the subject matter and propose the rules of the game happened during the so-called Keystone Dialogue. This dialogue comprised a series of round table meetings held between 1988 and 1991 for the purpose of breaking down barriers between actors and setting a future agenda (Fowler 1995: 172). The consensus-building exercise brought together more than 100 representatives of governments from North and South, industrial giants like Ciba-Geigy and Pioneer Hi-Bred, multilateral institutions, including UN agencies, NGOs like RAFI and GRAIN, national and international gene banks, and researchers, politicians and political activists. As explained by a key player from RAFI:

*Over three long years, seed duellists – patent directors of some of the worlds most hated transnationals, members of the devil-incarnate NGOs, Latin diplomats and Northern bureaucrats – confronted each other and learnt (...) slowly and painfully to move towards a consensus. (...) Coalitions of completely unexpected ‘bedfellows’ emerged and re-formed themselves throughout the years to reach consensus on points ranging from community conservation needs to the dangers implicit in intellectual property (Mooney 1996).*

Mooney explains the fact that the very powerful industry wished to participate in the negotiations by referring to their long-term research and development strategies and a need to partake in setting the scene for future markets (*ibid.*: 27). In other words, they treated it as a risk minimising exercise aimed at avoiding potential legal surprises, considering their heavy investments in research.

The relatively rapid consensus achieved within the Keystone Dialogue group reflects a trend within a growing number of environmental and agricultural organisations to extend their mandates to include a similar, integrated approach (Pistorius 1993).

Some of the results and recommendations of the Keystone Dialogue relevant to this project are the emphasis given to *in situ* conservation and the reaffirmation of farmers’ historic rights to save seeds without charge or challenge (The Oslo Group; *cf.* Mooney 1996). In the final consensus report, “Global Initiatives for the Security and Sustainable Use of Plant Genetic Resources”, the group recommended the following:

*UNCED 1992 consider plant genetic resources conservation as an important part of overall biological diversity conservation. (...) Plant genetic resources provide the basic raw materials to adapt crops to: expanding biotic and abiotic stresses; changing consumer preferences; and possibly changes in the environment... (Keystone Center 1991).*

The Keystone group outlined three recommendations:

1. To recognise the importance of the value of biodiversity for crop improvement.

2. To acknowledge that crop genetic diversity should be reached by a greater emphasis on *in situ* conservation instead of *ex situ* conservation, leading to the combination of the two.
3. To promote a closer involvement of the farm community in the (often *ex situ*) conservation and utilisation of genetic resources.

The different processes each contributed to the negotiations and the signing and ratification of a mechanism *meant* to be able to handle the global utilisation, conservation, and sharing of nature in both the widest and most specific sense possible:<sup>12</sup> the Convention on Biological Diversity (CBD). This is not to say that consensus has prevailed ever since. Struggles over rights to resources continue, only now, in a different and more regulated setting. The results of the negotiations may be summed up as in text box 1.5 taken from Mooney (1996).

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<sup>12</sup> The concept of biodiversity and subsequent institution building was meant to capture and bridge different domains and debates evolving around ways to prioritise, protect, use, and share the diversity of species, the genetic variability, the sustaining ecosystems etc.

*Text box 1.5: Some results of the Keystone Dialogue*

Issue	Before	After	Comment
International cooperation	No transparency, deteriorating cooperation	Increased openness, growing trust and co-operation.	Much of the progress was intangible. Gains are fragile and need reinforcement with a revised, broadened and legally binding FAO Undertaking as a protocol to the Biodiversity Convention.
The safety of <i>ex situ</i> gene banks and the overall conservation system	North's governments and industry said everything was basically fine and no new initiatives were necessary. South and CSOs said safety was a serious problem and there was an urgent need for new funding.	Recognition that there is a safety problem. There is an urgent need for new systems and long-term support.	
The role of FAO and IBPGR (later IPGRI)	North: FAO should keep out of IBPGR's way. South: IBPGR should be subordinated under FAO.	An intergovernmental body on the basis of one nation one vote (possibly FAO) was proposed to take charge and IBPGR should be a technical arm to this new body.	FAO/IPGRI relations improved enormously and IPGRI agreed to report to the FAO Commission but additional infrastructural work was needed.
National sovereignty over germplasm	North and South: plant genetic resources are the common heritage of humanity and must be fully and freely exchanged.	Common heritage still allows breeders to withhold specialist stocks until final varieties are produced; governments have the right to withhold germplasm that is vital to their economic interests.	FAO's 'agreed interpretations' acknowledge these changes but a whole new and clear Undertaking was needed that could become a protocol of the Biodiversity Convention.
Intellectual property and genetic erosion	North: There's no connection. South: There <i>is</i> a connection.	Plant Breeders' Rights could work against the interests of small farmers and, therefore, could accelerate genetic erosion.	Some industry participants in Keystone have since denied this connection once again even though they signed the Keystone report.
Intellectual property rights in general	North: These are beneficial to agricultural development everywhere in the world. South: These are a rip-off of Third World innovations and constitute a system that will force the South to pay royalties for their own genius.	Existing intellectual property systems exclude the poor and could be counter-productive for farmers in the Third World.	These statements had an impact at the Earth Summit and are among the reasons why the texts on intellectual property rights were not as strong as the US wanted.

(From Mooney 1996, table 1)

## Structure of the debate

Some observers have termed the relationships of power and knowledge behind the concept of biodiversity as 'hegemonic' in the sense that it consists of a complex network and a

*... vast institutional apparatus that systematically organises the production of forms of knowledge and types of power, linking one to the other through concrete strategies and programs. International institutions, Northern NGOs, botanical gardens, universities and research institutes in the first and third worlds, pharmaceutical companies and the great variety of experts located in each of these sites occupy dominant sites in the network. As they circulate through the network, truths are transformed and re-inscribed into other knowledge power constellations (Escobar 1998:p56).*

The Keystone process took this a long way, and it was even further tied together and formalised through the negotiation, formulation, signing and ratification of the Biodiversity Convention, the CBD. The CBD has become the "*master narrative of biological crisis*", as phrased by Escobar, "*translating the complexity of the world into simple narratives of threats and possible solutions*" (1998).

This process pretends to structure the way issues related to biodiversity are to be handled now and in the future; however, powerful parallel structures are also in the process of development, and they have influenced, and still do, the formulation and implementation of the convention. Some actors, both industry and governments, have been accused of playing a double game – in the on-going negotiations on biodiversity and the parallel negotiations on free trade.

The parties to the CBD organised the Convention to deal with three objectives. These concern sustainable use, conservation, and benefit sharing, and stress reciprocity in the exchange of genetic material and technology and the promotion of strengthened intellectual property rights, as well as the principle of national sovereignty over biological resources.

The utilisation issue was divided into three aspects, which are addressed to the nation state:

1. To integrate sustainable use into its decision making and avoid or minimise adverse effects upon biodiversity
2. To protect and encourage relevant customary use of biological resources in accordance with traditional cultural practices
3. To support remedial actions by local populations and encourage co-operation between government and private sector developing sustainable ways to use biological resources (CBD art. 10).

Two of the central articles (CBD art. 15 and 16) concern access to genetic resources and technology. Both articles treat access to technology and genetic resources in parallel, ideally promoting productive international agreements



without *requiring* them (Gollin 1993). These articles, more than any others, became the subject of a North-South dialogue, or more precisely conflict, between suppliers of genetic diversity vs. holders of biotechnology. The South stresses national sovereignty, whereas the North (led by USA) urges the uniform and globally applicable intellectual property rights (IPRs), which they succeeded including in the GATT (WTO) TRIPs agreement (see textbox 1.1).

The conservation effort is also to be integrated into national decision making by means of a threefold strategy: Identification and monitoring; *in situ* conservation; and *ex situ* conservation (CBD articles 7-10). In the first official document of such high legal and political status, with massive intergovernmental support,<sup>13</sup> the CBD article 8 promotes a strengthened role of *in situ* conservation in line with the Keystone recommendations, but mentions that *ex situ* conservation still has a role to play. Article 8j and the Preamble introduce the relation between the way rural and indigenous people live and the knowledge they produce and maintain. It stresses the importance of cultural, traditional practices and lifestyles for such knowledge and calls for equitable sharing of benefits derived from such knowledge, innovations and practices (see textbox 1.1).

Article 19, like article 16, addresses preferential technology transfer, with a particular focus on biotechnology. However, both articles are sprinkled with diplomatic terms like “as appropriate”, “when relevant”, “where feasible” and “on mutually agreed terms”, which, to put it nicely, leaves the Convention open for interpretation by the parties involved.

In the ‘fast lane’ negotiations (which are however temporarily blocked by popular protest at the recent meeting in Seattle) within the World Trade Organisation, WTO, the articles addressing intellectual property rights are less ambiguous, and backed by very serious trade-related sanction mechanisms. The US delegation, supported by a very enthusiastic President Clinton, works for as uniform and globally applicable intellectual property rights (IPRs) as possible (see text box 1.1). The negotiations have been characterised as the most closed circle ever formed on IPR, open only to a few high level officials and top ministers from a carefully selected number of governments (Fowler 1997). A strong, primarily North American-based biotechnological lobby influences the process.

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<sup>13</sup> At least at the level of the signatures of presidents, prime ministers etc.

## **The politicisation of nature conservation and plant genetic resources**

The new interest in biological diversity and certain unresolved problems have politicised the debates. To summarise, there are three lines of tension, which dominate the arena:

- The struggle for control over genetic resources within both agriculture and nature, driven by the increased demand for genetic resources for agricultural and pharmaceutical research, partly fuelled by the industry's massive investments in biotechnology
- The struggle over rights to knowledge (local and scientific)
- The struggle over potential profits and proposed benefit sharing from the marketing of products derived from both knowledge and genetic resources

This new situation made possible the development of several powerful mechanisms and institutions, such as the Biodiversity Convention (CBD), and the TRIPs dimension of the GATT Uruguay round on trade-related intellectual property rights (now WTO).

The CBD, which in Housman and Zaelkes words is "*an unusual example of the conjuncture of environmental, trade and intellectual property law*" (1992). A good example of the diverging interests in and concerns about the merging of these three legal domains is found in the aggressive attitude of the US delegation to the UN. The Bush administration seemed very influenced by the biotech companies. Although by the end of the negotiations other parties had given concession after concession in order to secure the important signature, the United States opposed the transfer of biotechnology and refused to sign the Convention, claiming that it undercut strong intellectual property protection and weakened competitiveness. After a change of government, and presumably due to advances in the 'fast lane' GATT negotiations, USA finally signed the Convention.

The TRIPs obliges parties (almost all countries) to protect the rights of commercial breeders and biotechnologists and their companies, and to ensure that they can claim and receive royalties on new seeds through patents or Plant Breeders rights.

The new situation thus facilitates and institutionalises further exploitation and to a large extent avoids or fails to address underlying causes of the loss of cultural and biological diversity. However, it also creates political space for otherwise marginal actors such as NGOs and popular organisations (like the indigenous ones).

## **Enter, the indigenous peoples' organisations**

In this section, I analyse the motives, strategies, and roles of indigenous peoples' organisations in the debate on biological diversity. But when did they enter the debate and what have been the implications of this? The analyses above of the international debate and the historical process for establishing rules and norms concerning use, conservation, and benefit sharing of biological diversity form the framework for understanding the development of indigenous peoples' positions and their reasons for choosing biodiversity as their main entry point to international diplomacy. The indigenous peoples' movement was active in the process up to the signing of the CBD, assisted by, among others, the Danish and Norwegian delegations to the UN. After this, the movement continued its presence during the four Conferences of the Parties to the CBD held during the 1990s. These negotiations concerned mainly the implementation and interpretation of the CBD. Likewise, important related processes have continued, such as the negotiations on intellectual property rights and trade within the WTO etc. In the following, these debates are discussed, viewed through the lens of indigenous peoples' knowledge.

Not surprisingly, indigenous peoples' interests are diverse, and the practices of their organisations and communities move along a range of different strategies. There are examples from Bolivia, Peru, Ecuador and Colombia of shorter sighted, economically based alliances founded on co-operation between, for example, public and private pharmaceutical research entities,<sup>14</sup> which most often have disregarded the intellectual property rights issue. At the other end of the scale, they join or develop political strategic alliances that aim to protect and secure vital rights and conditions for the continuous development of culturally based livelihood strategies (COICA, personal comments 1994) necessary for the production of knowledge on biodiversity<sup>15</sup> (Convention of Biological Diversity §8j).

The difference between the motives of most other actors involved and indigenous peoples and farmers can be described as the differences between a 'biodiversity project' as opposed to a 'life project'.

While a number of international NGOs, like GRAIN and RAFI, has been very active trying to shape the way biological diversity is to be conserved, the indigenous movement has from the beginning tried to link territorial demands and principles of self-government into the debate.

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<sup>14</sup> Like Shaman Pharmaceuticals.

<sup>15</sup> In the following chapters, I explore the nature of the relationship between how people live, how they organise the management of biodiversity, and the ways they produce and maintain knowledge of biological diversity.

The NGOs have raised such questions as: By whom and how should biodiversity be managed? Who has a stake in all this? And therefore: Who ought to partake in the decision-making process and the distribution of benefits derived from the utilisation of the resource? Along the way, they have fought fierce battles within relevant international bodies like the FAO to introduce and promote legal concepts like farmers rights as opposed to plant breeder's rights, and *in situ* conservation strategies as opposed to *ex situ*.

The indigenous peoples' movement has managed to navigate with diplomatic skill<sup>16</sup> in the debate over biological resources. For the first time in UN history, these groups have succeeded in redefining their position from the noble and the savage; the marginalised and the pitiful to become characterised as important, knowledgeable and innovative actors (CBD art.8j; see text box 1.1). To some extent, they moved out of the 'frozen' public image of static, romanticised subjects characterised as people whom society was morally obligated not to harm (too much). In this process, they have distanced themselves from the image of people without voices of their own. They have rejected the developmentalist and conservationist views of 'being in the way' of both conservation and development efforts. Hereby, they have achieved international recognition of their role as keepers and developers of biological diversity, and most important, they have managed to underline the inherent link to territorial claims, cultural knowledge, livelihood strategies and institutions.

For the indigenous movement, these first international signs of recognition did not arise out of a vacuum. They are some of the results of many years of political and cultural struggle. Latin American indigenous peoples – especially during the last three decades – have organised themselves around claims for land and civil rights. Pursuing these goals, they have employed both violent conflict and populist political strategies – never feeling at ease with the Western left-right dichotomy. Whereas Latin American states called the 1980s the lost decade because of the debt crisis, the indigenous movements referred to it as *la decada ganada*, the decade they had won (Bebbington et al. 1992). They had gained hitherto unheard of political ground in terms of land titling and political representation, and not least, they had strengthened their own sense of identity. Sometimes the reconstruction of indigenous identity (from farmers of subsistence) was initiated, facilitated, or strengthened by way of strategic concerns. Being indigenous suddenly proved useful, for instance in Peru, in order to gain or sustain land rights.

In Ecuador and Colombia, very large areas of land were titled to indigenous populations. Being indigenous also resulted in influential space in the negotiation process for a new constitution for Colombia.

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<sup>16</sup> Considering their often marginalized situation in the nation state – and therefore marginalized in the United Nations (states).



**Picture 1. Colombian indigenous senator Lorenzo Muelas  
During the 4<sup>th</sup> Conference of Parties to the Convention on  
Biodiversity in Bratislava 1998**

However, during the 1970s and 1980s, they had little room on their agenda to include international issues of how to regulate biological resources. So apart from a few clashes with the growing environmental movement, which often “*spoke on behalf of the indigenous peoples without true representation*” (COICA 1989; see text box 1.1), they first entered this debate in a co-ordinated manner during the late 1980s and early 1990s.

An article in their web-based biannual magazine COICA, Co-ordinating Body for Indigenous Peoples’ Organisations from Amazonia, relates indigenous peoples’ fight for resources, land, knowledge, and practices to the CBD and the following years of negotiations. COICA sees these negotiations as a process of high strategic importance, since “*biodiversity to the Western [peoples] is synonymous with intrinsic and gigantic potential might, of enormous economic, social, political and cultural value*” (COICA 1999).

COICA explains further that since indigenous peoples were not granted a role in Agenda 21, COICA and other indigenous bodies decided that the biodiversity question was a suitable arena to promote their causes.

In the wake of the GATT agreement on trade-related intellectual property rights (TRIPs) COICA hosted, together with UNDP, a regional conference on intellectual property rights and indigenous peoples’ rights (in Santa Cruz, Bolivia 1994). The TRIPs included an article (27.3b) in which alternative IPR systems (to patents), the so-called *sui generis* systems, were accepted. Given the influential lobby working for universal IPRs and the fact that the TRIPs agreement was to be renegotiated in 1999, the indigenous movement and supportive NGOs saw the need to develop their own positions by analysing whether the *sui generis* systems could be a way to secure collective property rights.

In the declaration from the COICA/UNDP meeting, the indigenous organisations developed a political and strategic outline and a short-term plan of action. The basic principle was that indigenous peoples must be “*recognised as collective entities possessing intangible rights over their own nature*”. They decided that the CBD ratification and implementation process should be followed carefully. Therefore, during the third Conference of Parties (COP3) in Buenos Aires in 1996, the indigenous movement proposed alternative mechanisms for the implementation of article 8j. A suggestion was made to create an ‘open-ended group’ on the matter, with equal participation of indigenous peoples. The indigenous peoples’ organisations met in 1997 in Madrid, and in 1998 in Bratislava to refine their positions. There was a sense of great expectation prior to the COP4. However, these expectations, as expressed by the taped mouth of Colombian indigenous senator Lorenzo Muelas (picture 1), were not met at the conference. The national government delegations of USA, China, and some countries from the South decided not to listen to nor accept substantial points raised by indigenous peoples. Thus, it became clear to the indigenous movement that article 8j is in reality a low-level entity, on which national governments have the final decision. This was

further emphasised at the first meeting of the “Ad hoc open-ended intersessional working group on article 8(j) and related provisions of the Convention on Biological Diversity” during March 2000 in Seville, where steps were taken towards a synergy between TRIPs and the CBD. Currently, the institutions and national parties are looking into ways of developing legal protection for rights to knowledge and plants at the national level, and to secure that plant genetic material be given geographical reference. This should enable benefit sharing across national boundaries. However, none of these initiatives will secure indigenous peoples’ rights in countries where they are marginalised by the national state.

At the WTO meeting in Seattle,<sup>17</sup> the planned review of the TRIPs article 27.3(b) ended up in procedural discussions. Governments of the South interpreted ‘review’ as ‘renegotiation’, whereas others did not wish to open up for renegotiations. The United States sought to limit the *sui generis* systems or even erase the term, thus strengthening the universal IPR system based on patents. Hereby, they would devaluate article 8j of the CBD. However, they met strong opposition from governments from the South. Upon reviewing the process, COICA concludes that they see important lessons in

*... maturing processes of alliances with indigenous and non-indigenous sectors from all over the world, to co-ordinate long term strategies and actions. (...) If these alliances are consolidated and work sufficient time the coming process will consolidate and the presentation before the conferences will be even more consistent. Another lesson is that we should be ready to take positions which put pressure on the states to recognise certain fundamental rights they should never compromise with. This way we managed, in Bratislava, to secure that we at least be given a voice in the “Open-ended Group”. Within systems like the United Nations, the dynamics of the conferences often respond to very rigid, slow and bureaucratic structures. Therefore we must focus our efforts to work for and consolidate the processes by way of studying, ‘el cabildeo’ [internal negotiations and dissemination] and to make proposals continuously (COICA 1999).*

The alliances that are built and maintained are shaped by the objectives and means exercised by the partners. The notion introduced earlier that these allies differ from the indigenous actors, in that they see their ends as a biodiversity project and not as a ‘life project’, may present the more vital constraints for the alliance. An example may be that the partners wish not only to encourage people to live according to vital elements of their cultural norms and practices, but to make this a condition for the partnership. This would be impossible and entirely undesirable for the indigenous organisation and represent a limit to co-operation.

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<sup>17</sup> Which as a result of the popular protests never really took off.

Avadio Green, the president of the National Organisation for Indigenous Peoples in Colombia, ONIC, expressed during an interview that the links between living and knowing are of crucial importance to them, especially concerning biodiversity. He said that they made an effort to follow and influence the debate, assisted by indigenous and non-indigenous lawyers and others, but that they had little capacity to do so. Avadio Green expressed a need for in-depth understanding of the processes that are putting indigenous learning and livelihood systems under pressure and sometimes even at risk.

Similar to Avadio's concerns, COICA reflects on their weaknesses in the process. COICA describes the difficulties with keeping up with the complex and multifaceted national and international agenda. Likewise, they suffer from a lack of capacity to "*socialise the processes with their popular basis*", and a continuous lack of resources to gain an in-depth understanding of the matter. Having said this, however, COICA recounts the many accomplishments (as described above) and describes future battlegrounds (COICA 1999).

Considering the heterogeneity among and within indigenous peoples' communities and organisations, it is promising to see how far they have managed to come in influencing the negotiations on the CBD. I have already stressed the indigenous movement's strategic cultural politics as one explanation for their current successes. However, the rhetoric and alliance building would be short sighted and of limited effect had they not been substantiated with very strong arguments concerning knowledge of biodiversity and mechanisms to use it and, not least, conserve it. The recommendations issued by the Keystone group and the work of academics underlining the need to base future conservation efforts to a much larger degree on *in situ* use and conservation strategies and mechanisms<sup>18</sup> were instrumental for this process. (Rhoades and Nazarhea 1999; Balée 1989; see also Kronik n.d.). These recommendations were substantiated by a growing body of so-called ethno-biological and ethno-ecological literature on the extent and value of indigenous peoples' knowledge of biological diversity. Especially, a number of studies from tropical and subtropical regions have documented over the last decades the vast extent (Conklin 1954; Berlin, Breedlove, and Raven 1974; Descola

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<sup>18</sup> One of the limits to IK on plants often referred to is the inadequacy of orally transmitted and stored knowledge over time and distance. Therefore, a documental (written) approach is often promoted. However, the high level of detail and the 'completeness' of the cultural domains of this knowledge (plants known to a cultural group/all plants known from a relevant area) indicates the existence and use of efficient and highly developed ways of storage and transmission of knowledge and information. Another limit easily imaginable is the difficulty to access plant material from a distance to solve situations of stress from the environment, for example. However, studies have shown that a large percentage of the plants used by one ethno-linguistic group can also be found in use among other people very far away (Balée 1989). This indicates that there are, and have been, very developed ways of distribution and exchange of important germplasm.



1988; Boom 1987 and others) and the local and global significance of indigenous peoples' knowledge of plant diversity (Kronik 1993/1999; Rhoades and Nazarea 1999, Balick 1988, Hecht and Cockburn 1989, Lacy 1994, Prádesesh 1999). Indigenous peoples' knowledge of the utility and ecological characteristics of plants and their models for conservation have proved to be particularly vast, complex, and detailed in highly diverse environments (Berlin 1992). Examples from quantitative surveys in the Amazon Basin reveal that the percentage of all known species compared to the total amount of all species is very high. In several studies, up to 95 percent of the total number of plants found in randomly selected forest areas was known and named by a culturally or spatially defined group of people. This was documented by among others, Boom (1987) in Bolivia, Posey and Balée (1989) in Brazil, Padoch and De Jong (1991) in Peru, and Sánchez Sáenz and Rodríguez. (1990), Vélez and Vélez (1992) and Duivenvoorden and Lips (1993) in Colombia.

Conklin (1954) was among the pioneers to analyse the richness of the factual knowledge within the domain of plants in his study with the Hanunóo in The Philippines, demonstrating knowledge of more than 2000 plants and an intimate knowledge of local flora and of classificatory principles. By showing that the Hanunóo people use 93 percent of the plants they know, Conklin was apparently the first to counter the common understanding that local economies are sustained by using a very narrow selection of the plant genetic base regularly (Conklin 1954; cf. Levi-Strauss 1962). This work contributed to an increase in the amounts of ethno-botanical and ethno-biological work undertaken that investigated different aspects of so-called folk taxonomies, i.e. how indigenous peoples have categorised flora and fauna over the last four to five decades (Berlin, Breedlove and Raven 1973, Berlin 1992). An indication of the complex character of the knowledge systems encountered and their diverse domains and types of knowledge, is that ethno-botany and ethno-biology evolved to cover several disciplines, such as anthropology, botany, ecology, economics, ethno-pharmacology, linguistics and psychology (Martin 1995).

## **Conclusion**

From this discussion, we may conclude that the issue of conservation and use of biodiversity is a highly politicised one, with diverging interests and discourses. During the last 10-15 years of the 20<sup>th</sup> century, powerful institutions have been developed to handle these interests and the various existing and potential conflicts. The indigenous movement has advanced tremendously using the biodiversity issue as its platform for securing fundamental rights. However, these rights are still subject to national legislation and for the most part to national implementation, and to supra-national actors and forums. The most remarkable

positive stepping stone for the indigenous peoples' movement is the formulation achieved, especially in article 8j of the CBD, which officially recognises the dynamic character of knowledge production and the inextricable links to traditional lifestyles, as they were coined. There is little doubt that this is the case, when one is confronted by the increasingly detailed literature on local cultural models of nature. Studying these, and in particular relating them to so-called modern understandings of nature and ways and requirements to use and conserve biodiversity is no easy task...

*Unlike modern constructions, with their strict separation between biophysical, human and supernatural worlds, local models in many non-western contexts are often predicated on links of continuity between the three spheres and embedded in social relations that cannot be reduced to modern, capitalist terms (Escobar 1998).*

Indigenous peoples' knowledge is therefore rarely understood on its own terms, or it is refunctionalised to serve the interests of Western-style conservation. Therefore, to understand how indigenous peoples' knowledge is produced and maintained, "*we have to go beyond, for example, political economy's argument of capital's predation of local ecologies and knowledge*" (Shiva 1997 cf. Escobar 1998). Thus, I intend in the following chapters to explore how indigenous peoples' knowledge is related to livelihood strategies, cultural practices, and territory, considering basic cultural and epistemological issues, and paying particular attention to the extent to which local and modern forms of knowledge entail different ways of apprehending the world and of appropriating the natural, as suggested by Leff (1997).

The analyses of this research question require a conceptual and empirical exploration of how indigenous peoples' knowledge on biodiversity is related to place and culture, how it is being institutionalised; which elements, institutions, practices and processes that form part of the different livelihood strategies are most important to knowledge production on biodiversity; and how knowledge production is affected if these elements, institutions, practices, processes are under stress? In order to address these questions there is a need to understand how knowledge production is looked upon today and has been looked upon recently. It appears that a powerful dualism or dichotomy has been created between scientific and other bodies of knowledge. The inherent hierarchy of this dichotomy may serve to emphasise issues of power and failures to grasp the importance of contextuality. However, it also pre-empts important analyses of common features such as specialisation and indigenous research practices. Hence, there is a need to explore why we look at knowledge production this way, and discuss whether it is helpful for an analysis of the dynamic of the making, maintenance and changing of this knowledge.



## CHAPTER 2

### CONCEPTUAL FRAMEWORK

In the previous chapter, the political struggles over biological diversity and especially the importance and future role of local knowledge in the use and conservation of these currently and potentially valuable resources were discussed in the international context. Questions were raised concerning the dynamic character of knowledge production related to biological diversity and the linkages to the contexts of place, action, and culture. As of recently, the creation, or more broadly, the production of knowledge is being discussed as taking place through a number of different processes (Havelock 1986; Illeris 1999) that lead to the establishment of facts. Facts are seen as both concrete knowledge; knowledge of ways of doing things; and knowledge of causal or other relations of any nature. As diverse as such facts may be, they are claimed to have a common denominator, namely that they, or rather their meaning and relevance, are to different extents subjective and related to the context of their making, and that they can be placed historically and culturally. While these ideas, and the criticism of positivism they represent, seem to be gaining ground, questions about in which ways and to which extent such knowledge processes are linked to context remain less explored. The analysis in this chapter stems from a wish to explore these questions further. The discussion falls into two parts: The first is on knowledge and knowledge production; and the second examines the pivotal relevance of context to knowledge production.

#### **Knowledge and knowledge production**

Here, I examine a recent central debate on local knowledge, including a discussion of whether local knowledge is different from scientific knowledge. This debate has contributed substantially to the way we understand knowledge production today, not least concerning knowledge production about biological diversity. The debate has resulted in the construction and politicisation of a body of 'non-scientific' knowledge, and a parallel demonstration of how scientific knowledge production is inherently related to the context of its making, thus disputing its alleged universality and the neutrality of particular interests.

However, few of the proponents of a common 'non-scientific' body of knowledge have devoted much attention to defining what they mean by 'local' or 'locality'. Is the term simply employed to establish contrast with the acclaimed universality of scientific knowledge? Or is it used to indicate the special historical conditions for

its generation, exposed as local knowledge production may be to pressures from expanding industrialisation or isolation through processes of marginalisation? How, then, can we understand what delimits this sense of 'locality'? How fixed are the boundaries, and what is their nature? Does it indicate that local knowledge is produced from a different set of processes? Or is it rather, or also, the alleged unique character of the culture/nature relationships among so-called local, rural or indigenous people that best describes this notion of locality? These questions guide the following analysis.

### **The idea that objective and universal knowledge is free of the influence of special interests**

The phrase, as a matter of fact, is often used as an opener, when someone wants to persuade us of something they think we should not hesitate to believe. In modernist thinking, scientific facts are seen as ahistorical, objective, universal, and value and context free. For a long time, science has been regarded as the only true provider of such knowledge.

The dominant positivist belief in objective truth and in science's monopoly on the discovery of such truth can be traced back to ancient Greece. Essentialism, as first developed by Plato and his pupil, Aristotle, claims that everything has a finite, absolute, and describable essence. However amused we may be of its description of the essence of human beings as "a two-legged featherless animal", essentialist thinking has actually been of impressive importance in the ways Western and other societies understand and act upon the world. It permeates most of our society and is sustained by strong institutions. It affects the ways in which we seem to make order, especially after empiricist understanding was developed one and one-half millennia after Plato. The empiricists argued that it was not enough only to describe the finite truths about the nature of things and beings – they also had to be tested in 'reality'. Thus, fundamental knowledge processes for most past and present knowledge production were formulated, such as 'observation', 'description', and 'testing'. These processes can be employed to gather and analyse certain aspects of field material. When studying knowledge about something as concrete as plants, as I do, one is constantly presented with seemingly endless lists of facts about their specific qualities, characteristics, and meanings, and the ways to handle them. While analysing this information, positivist thinking may bring us part of the way toward understanding the links between knowledge production and ways of living. For instance, it helps us understand why old people know more or less than young people, why men know some things and women others etc., insofar as differentiated social and cultural access to certain activities and fora will expose people in different ways to different domains and types of knowledge. This does not conflict with the positivist notion of 'one objective truth'. However, other lines of thought must be consulted to understand how

different individuals can view the same phenomena differently, and with the same right. Unlike positivism, social constructionism emphasises the negotiation of processes leading to the establishment of knowledge, claiming that all knowledges, such as taxonomical, ecological, horticultural etc. types of facts, are all products of complex processes of inquiry, negotiation, and institutionalisation (Latour 1999). Positivism and essentialism, with their faith in absolute objective truth, cannot explain this.<sup>19</sup> Within the framework of social constructionism, facts are seen as constructs developed out of culturally and historically specific contexts (Burr 1995; McCarthy 1996). In other words, facts are dealt with as fabricated knowledge. So, whenever I refer to knowledge as information or fact, it carries a history. It is mainly the 'history', i.e. the processes leading to the production and reproduction of knowledge that I find interesting, especially how they are socially and culturally embedded.

The prevailing understanding of knowledge as being free of influence by political interests and social values had a strong influence on post-World War II multi-lateral development assistance and agricultural research and technology transfer. Practice during this period is particularly relevant for discussions on local knowledge (Chambers and Jiggins 1986; Agrawal 1995). Uncritical praise of the benefits of Western science and technology was implicit in the efforts made and the ways in which they were planned, executed, and discussed. The dominant view was that lesser developed regions and countries could be 'raised' to acceptable 'levels' of development by climbing a number of well-defined steps through proper use of the best available knowledge and the transfer of scientifically proven technology and resources. This 'best' knowledge was defined by its high scientific standards developed in modern institutions. Development plans, conservation plans, agricultural research and extension schemes etc. were outlined, but only rarely did they take socio-political conflicts, environmental conditions etc. into consideration. Massive investments were allocated to so-called mega-projects, which were meant to tackle structural problems 'overnight'. The problem complexes were often based on what the donors had to offer. They were not client-driven and based on a thorough historical analysis of power relations and underlying constraints (Ferguson 1990). In chapter one, I addressed these aspects in the context of the use and conservation of biological diversity, referring to some of the damages resulting from this line of thought, and I analysed some of the major new alliances being formed, partly in response hereto. Some of the main players on the international scene continue to develop strategies based on an understanding of the superiority of scientific knowledge to other knowledges, while others were based on a critique hereof (Escobar 1999). A group of academics and

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<sup>19</sup> The only way positivism can explain this would be to refer to them as two different views, both of which are only partial truths (due to human lack of capacity and the infinite character of the world).

practitioners had embarked, implicitly or explicitly, on a political project to counter the centralised, technically oriented, (mega-) project solutions to third-world development, addressing in part the failure of the so-called green revolution technologies to reach the poorest farmers (Chambers and Jiggins 1986; Agrawal 1995). One of the most influential local knowledge proponents, Richard Chambers,<sup>20</sup> emphasises inequality, power, and the sense of prestige as some of the differences in relation to modern scientific knowledge. He claims that scientific knowledge

*... is centralised and associated with the machinery of the state; and those who are its bearers believe in its superiority. ITK, in contrast, is scattered and associated with low prestige rural life, even those who are its bearers may believe it to be inferior (Chambers 1980 cf. Agrawal 1995).*

This was part of a political project to establish a dichotomy between rural people's knowledge and Western, scientific, and/or so-called modern knowledge. Separately as well as together, these academics and practitioners conceptualised what they saw as a body of knowledge, which had as its main common denominator that it was different from scientific knowledge. The concept of local knowledge<sup>21</sup> springs from a process of politicisation that has shaped the ways in which it is understood today. As argued by Bebbington (1994), the first sense in which local/indigenous knowledge is constructed is as a concept within an academic community. Simply by naming it, this community of scholars and practitioners (including Altieri (1987); Brokensha, Warren and Werner (1980); Chambers, Pacey and Thrupp (1989); Gliessman (1990); Warren, Slikkerveer and Brokensha (1991); Warren, Slikkerveer and Titiola (1989)) have created the idea that such a body of knowledge exists in a coherent form. As we saw in chapter one, the effort has been successful. Local knowledge in general, and knowledge of biodiversity in particular, are now taken more seriously than a few decades ago, as result of a political process to which the authors named above have contributed substantially.

In the following, I will examine briefly the arguments employed in constructing a dichotomy between local and scientific knowledge, in order to understand what is common to knowledge and knowledge production within what is claimed to be a coherent body of knowledge. Probably the most commonly accepted classifying principle for 'non-scientific' knowledge is its claim of particular boundedness to a locality. As stated by Jack Kloppenburg:

*The locality of such knowledge production [is the concept] which most completely intimates the many dimensions of its character. Such knowledge is*

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<sup>20</sup> Proposing the term "indigenous technical knowledge", ITK, at a milestone workshop at IDS, Sussex, 1979.

<sup>21</sup> Including terms like indigenous knowledge, indigenous technical knowledge, indigenous agricultural knowledge, and rural people's knowledge.

*local in the sense that it is derived from the direct experience of a labour process which is itself shaped and delimited by the distinctive characteristics of a particular place with a unique social and physical environment (Kloppenburg 1991).*

I will present various aspects that have been claimed to constitute the 'local' of local knowledge.

### **The idea that local knowledge is derived from *closed* versus *open* knowledge system**

Certainly, most local knowledge systems have more limited access to information than, for example, high profile public and private research institutions. But 'having different types of access to quality information' does not equal 'not having access to non-local information'. Levi-Strauss is often referred to as the source of the notion of the closed knowledge system. He saw these systems as "*islands in a chaotic sea*" (1962). This raised a long debate, mainly during the 1970s, in which post-structuralists argued that instead of looking for stability in structures, one should analyse movements and relations within and between structures (Stjernfeldt 1994). Rather surprisingly, Howes and Chambers, the organisers of an important workshop<sup>22</sup> at Institute for Development Studies, IDS, Sussex in 1979, paraphrase Levi-Strauss in this respect in their influential article from 1980, arguing that so-called indigenous technical knowledge differs from scientific knowledge in "*the way practitioners of the two modes of thought represent to themselves the natures of the enterprise in which they are engaged*". "Science", Howes and Chambers continue, is an

*... open system whose adherents are always aware of the possibility of alternative perspectives to those adapted to any particular point in time. ITK, on the other hand, as a closed system, is characterised by a lack of awareness that there may be other ways of regarding the world (Howes and Chambers 1980: 330).*

On this point, the various advocates of local knowledge disagree. Bell, for instance, argues that it makes no sense to delimit the making and maintenance of this knowledge (ITK) from other sources of influence, current and historic (1979). Cultural flows bring in new non-local specific insights and thus contest existing explanations, and they are not particular to either scientific or other knowledge productions, but to context – hence, all knowledge production will depend upon contextual conditions and relations. Giddens (1979), Sahlins (1985), Descola (1994) and others have more recently demonstrated that there is no such thing as a closed knowledge system. All types of knowledge constitute both empirical ideas

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<sup>22</sup> For the introduction and conceptualisation of "indigenous technical knowledge" (ITK).



and the principles that underlie their formation, organisation, and meaning. All types of knowledge productions are influenced, in varying forms and degrees and over time, by many sources, including modern ideas and technologies. Giddens argues that the imagined closed character of a system is opened when people, as part of their practices, interpret concepts into a different context than the system.

Within the larger discussion of local knowledge production as 'open' or 'closed', a more specific debate has evolved around the notion, 'local as opposed to central'. This debate is based upon an understanding of the production of knowledge and of local knowledge itself as being marginalised from greater society, both in terms of access to rights, benefits, and decision making, as well as to sources of information. Substantive differences due to 'remoteness' from dominant knowledge systems are often related to historical processes of marginalisation. This view entails an understanding of the importance of their particular ways of living, working, and learning in a particular place to knowledge production about biological diversity found among indigenous and other rural peoples. Banuri and Appfel Marglin (1993) and Rhoades and Nazarea (1999) point to the co-incidence of historical and current processes of marginalisation from the world economic order and the presence of high quality local knowledge systems. They argue that marginality at various levels is a key common designator of *in situ* conservation-based local knowledge systems. Rhoades and Nazarea reinforce their argument, drawing on the work of Dasmann (1991), with the observation that most farmers with a highly diversified production system are typically found in more remote mountain, island, rain forest, or desert agro-ecosystems, which are temporarily insulated from the dominant forces of the outside world economy. Rhoades and Nazarea continue:

*Communities – and households within communities – with a propensity to maintain diverse systems tend to be disenfranchised from the dominant order surrounding them. Even the individuals who tend to be key native conservators are marginal within their own households (Rhoades and Nazarea 1999: 220).*

Likewise, there are numerous historical examples of local knowledge (e.g. of production systems or the biological diversity of the forest) that *has* vanished because of specific economic and other reasons. Although Rhoades and Nazarea treat the issue of marginalisation as a phenomenon that happens to correspond positively with the quality of biodiversity management systems, it is important to stress that marginalisation does not necessarily lead to higher diversity. By this I mean that the argument should not be used for legitimising or even enhancing processes of marginalisation, as this evokes controversial connotations of ethnocentricity. People responsible for developing the knowledge systems that Rhoades and Nazarea refer to, may not see themselves as marginal – actually, often on the contrary. Savyasaachi describes how Hill Maria indigenous people of India see themselves and the land they live in as the centre of everything (1993), just as

indigenous groups do in the Amazon (Echeverri 1997; Kronik 1999). However, knowledge of the impact of processes of marginalisation should lead to history-specific methods of analysis of the meeting of cultures:

The dimension of marginalisation has also been addressed in discussions around the meaning and use of a term comparable to 'local', namely 'indigenous'. By referring to the 'post-colonial' dimension, however, attention has mainly been focused on debates concerning the destabilising effects of processes of repression and marginalisation<sup>23</sup> on the societal and cultural conditions necessary for the production and maintenance of local knowledge.

### **The idea that local knowledge is produced by different processes than scientific knowledge**

Two contrasting views are offered by Howes and Chambers, on the one hand, and Bell, on the other. Howes and Chambers, seemingly inspired by Lévi-Strauss' notion of *bricolage* (Lévi-Strauss 1962),<sup>24</sup> propose that local and scientific knowledge production differ with respect to analytical capacity. They say:

*An important difference between science and ITK lies in the way which phenomena are observed and ordered. The scientific mode of thought is characterised by a greater ability to break down data presented to the senses and to reassemble it in different ways.*

They claim that the "mode of ITK", on the other hand, "is 'concrete' and relies almost exclusively on intuition and evidence directly available to the senses" (Howes and Chambers 1980).

Martin Bell, an early discussant of ITK, was among the few from the IDS seminar to question the making of this knowledge. Unlike Howes and Chambers, he does

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<sup>23</sup> As those held in the UN General Assembly and in the ILO (paragraph 169).

<sup>24</sup> *Bricolage*, also referred to as handyman's knowledge production, was first coined by Lévi-Strauss in his historic first chapter of "Le Pensée Sauvage" (1962). It describes a skilled methodology of combining and recombining available material (like plants) and knowledge of the material, employing them as semi-fabricata in the search for new forms and products and, in consequence, knowledge. Lévi-Strauss contrasts the *bricoleur* with the engineer. The latter is supposedly able to and actively seeking to break new territory through his or her unlimited access to knowledge and products. The inconsistency of Lévi-Strauss is that in some parts of his work he refers to the advanced mechanisms and methodologies of indigenous peoples, not only to store vast domains of knowledge but also to break new ground, while on the other hand, he claims that the knowledge production of the engineer not only differs from that of the *bricoleur* by its different conditions, but also by the apparent lack of any wish on the part of the *bricoleur* to expand knowledge beyond rather unspecified boundaries.

not find grounds to consider the production of indigenous technical knowledge to be methodologically different from scientific knowledge production. He argues that too little is known concerning both categories:

*ITK is probably often created by processes involving these features of the scientific method [systematic observation, quantification, cumulative acquisition, experimentation and hypothesis testing] – albeit in varying degrees, and with varying formalisation of the procedures (Bell 1979: 45).*

Somewhat in contradiction to his *bricoleur*'s lacking ability to expand knowledge frontiers (see explanatory footnote above), Lévi-Strauss (1962) argues against seeing scientific and local knowledge productions as simple dichotomies. He argues that both imply the same method of thinking and thereby differ less in their nature than by the phenomena they deal with and the circumstances under which they are developed and maintained. It is more appropriate and convenient to compare them as separate epistemologies and ontologies with different theoretical and practical results (Lévi-Strauss 1962).

Adding to this, a parallel body of literature has appeared that examines critically the nature of knowledge production. Authors like Latour and Woolgar (1986), Harraway (1988), and Knorr-Cetina (1995) have documented how different representations of scientific production are inherently related to the contextual conditions under which it is made. These findings contribute to understand scientific knowledge production as being developed and maintained within so-called cultures of science. Such cultures of science are composed *inter alia* by incentive structures, specific environments, and varying types and degrees of influence and demands exerted by certain clients on knowledge production. Authors like Horton (1967), Harding (1994), and Hess (1995), call into question the claims of universality that are often made for science.

Historically, there are good reasons to believe that these research-like activities referred to above by Lévi-Strauss and Bell, have been formalised into institutions, specialisations, and complex learning systems. Lévi-Strauss (1962) and Rhoades and Nazarea (1999) speak against the earlier so common notion that so-called traditional knowledge is only generated from either a conscious pursuit arising from a pressing 'need-to-know', or from 'accidental circumstances', such as suggested by idealist and romanticist traditions. Lévi-Strauss argues that indigenous peoples have not only developed impressive folk taxonomies (see also Conklin 1954) and invaluable technologies such as pottery making, weaving, and agriculture, but that achieving and not least maintaining these rich domains and skills require highly developed knowledge processes and social mechanisms.

*The 'enormous conquests' cannot be explained by unforeseen accumulation of a series of accidental discoveries, nor by discoveries carried out through passive observation of certain natural phenomena.*

But, as he continues,

*The conquests depend upon centuries of active and methodological observation and bold hypotheses-setting which are validated or discarded through tireless repetitious trials (Lévi-Strauss 1962).*

Rhoades and Nazarea draw on Harlan to extend this line of argumentation, documenting that the historic tendency for pre-industrial and marginalised agricultural communities has been to foster and increase diversity rather than decrease it (Harlan 1995). Their management is based on specialised knowledge systems (Rhoades and Nazarea 1999,<sup>25</sup> see also Braidwood 1967; Howes and Chambers 1980; Richards 1985; Banuri and Apffel Marglin 1993; Ramachandra Guha 1993; and Rhoades and Bebbington 1995).

This historic evidence is supported by a growing number of ethnographic studies that demonstrate the existence of self-confident, articulating, complex systems of knowledge in what are experienced by many as inhospitable regions of the world, such as the Kalahari desert, the Australian outback, the Indian jungle, or the Amazon forest. This illustrates a very important point: That any knowledge-producing system includes a high degrees of conscious reflexive activity.

However, this is not necessarily particular to indigenous peoples. Anthropologists and sociologists working in and around centres of technology generation like the CGIAR spearheaded important shifts in the way farmers' knowledge systems are viewed today (Bebbington 1990). They have stressed and illustrated the skill and ingenuity of peasant technical knowledge systems (see Chambers, Pacey and Thrupp 1989), and have played a key role in promoting the idea that there is a body of knowledge that we could call indigenous science (Brokensha et al. 1980; Richards 1985). According to these arguments, indigenous and other rural people not only maintain and develop valuable insights and knowledge. They also develop institutions and learning processes for acquiring and maintaining these insights. These institutions and learning processes are shaped by cultural practices developed over time in interaction with different social groups, cultural flows, and complex<sup>26</sup> and changing biophysical conditions. In my view, this work together with that of Bell (1979), Rhoades and Nazarea (1999), and others raise some important points for further inquiry. These include the degree and kind of formalisation of knowledge processes.

The production and reproduction of knowledge consist of knowledge processes such as observing, contesting, experimenting, communicating, evaluating, validating etc. The composition and relevance of each of these processes vary with

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<sup>25</sup> Rhoades and Nazarea (1999), however, claim that these systems differ fundamentally from scientific methodology, but they do not substantiate this point in their article.

<sup>26</sup> Particularly in the case of the highly diverse Amazon rainforest, which presents endless possibilities for discovering new ways of doing things, but also endless threats in the forms of pests, diseases etc.

location, which in turn influences the social, cultural, and natural conditions. Havelock (1986) proposes an analytical division into a number of sub-processes, much like Bell, but emphasises that this is merely for analytical purposes as the sub-processes are so interrelated that they will be hard to pinpoint, not to mention separate in 'real-life' situations. Some processes can be divided in time and even by agent, but often several of the processes will take place in one act and/or carried out by one person (see also Long and Villarreal 1993). So it does not necessarily make sense to order the processes in chronological sequences, like a train of thought and action consisting of separate wagons.<sup>27</sup> It is more helpful to divide the processes involved in knowledge production into their cognitive mental acts and their social relational activities. This will provide us with a complete, or the best possible picture of knowledge production, since knowledge is ultimately carried by the individual but negotiated between people. These processes cannot be dealt with meaningfully without understanding the context in and from which they occur, including the mechanisms validating and/or disputing knowledge. This involves analysis of issues of cognition and recognition, as well as agency and institutionalisation, not forgetting the relations of power involved.

So, instead of embarking on an empirical and conceptual inquiry into the making of indigenous peoples' knowledge on the basis of a generalised and uncritical dichotomisation of local and scientific knowledge, it is more appropriate to step back and start with knowledge production in general, and break it up analytically, as suggest by Agrawal (1995), into different domains and types. The production of knowledge within each of these domains should be seen as open and dynamic systems that may entail different methodologies and epistemologies. As Agrawal explains:

*Somewhat contradictorily, but inescapably so, the same knowledge can be classified one way or the other depending on the interests it serves, the purposes for which it is harnessed, or the manner in which it is generated* (Agrawal 1995).

Agrawal adds that it is not only relevant to deal with the knowledge we encounter, but also to understand the ways it is regarded and presented by different stakeholders. The focus must be on how knowledge production is shaped (and constrained) by different cultural, socio-economic, and biophysical context-specific conditions, as well as on the political motives affecting how knowledge is presented.

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<sup>27</sup> As illustrated by Long and Villarreal (1993).

## **The universal significance of context for knowledge production**

In this second part of the chapter, I focus on central aspects of the contextual character of the making and maintaining of knowledge. Knowledge production depends upon sets of knowledge processes. I set out by drawing on discussions of both mental and relational processes, with a particular focus on reflection, negotiation and interaction. The analysis of central processes leading to the production of knowledge is taken further by exploring the relevance and character of so-called knowledge institutions, seen as frameworks of shared meanings that institutionalise, promote, and refine learning processes and capacities.

### **Knowledge processes**

#### *Mental and relational processes*

In the following, I discuss how knowledge is developed, disputed, and maintained, first by the individual and then by society. I draw first on recent literature from mainly cognitive anthropology and psychology, and then on sociological studies of knowledge. Although I do not go into detail regarding psychological processes, it is useful to briefly touch upon this angle of the debate on learning, especially among cognitive anthropologists and psychologists, in order to explore how knowledge processes can occur as mental acts – both in contact as well as in non-contact situations. This angle also contributes to understanding intercultural variation, i.e. why people in similar cultural (etc.) settings interpret the same event or impression differently.

We order our perceptions in groupings or categories according to complex information obtained through our senses (i.e. information on objects which look, taste, feel, smell or sound alike or different from something else) and through our experiences with objects and relationships between them. Cognitive scientists have been working on different aspects of the ways in which information is perceived. In this work, the concept of schema stands out. Mandler describes schema as “organising experience”:

*Activation of parts of a schema implies the activation of the whole, distinct from other structures and other schemas. Schemas are built up in the course of interaction with the environment. The schema that is developed as a result of prior experiences with a particular kind of event is not a carbon copy of that event; schemas are abstract representations of environmental regularities. We comprehend events in terms of the schemas they activate. Schemas are also processing mechanisms; they are active in selecting evidence, in passing the data provided by our environment, and in providing*

*appropriate general or specific hypotheses. Most, if not all, of the activation processes occur automatically and without awareness on the part of the perceiver-comprehender (Mandler 1984:55-56 cf. D'Andrade 1995:122).*

These cognitive frameworks are evoked to categorise, verify or dismiss information without our conscious awareness or will, and are therefore not necessarily linked directly to the usefulness (or non-usefulness) of, or need for, a particular piece of information.

A schema may be highly individual, which is one explanation of why people interpret situations differently. This last observation is supported by recent socio-neurological research, which shows that for humans and animals to react upon perceptions, these have to be interpreted first by the individual. Chilean researchers have come up with interesting evidence of the fundamental need for living organisms to interpret perceptions before they can act upon them. In short, they studied how frogs perceive and catch flies and found that there is no neurological connection between the two processes to explain how the frog can distinguish the fly from other flying objects. The observation that a frog *can* distinguish led Maturana and Varela to conclude that this identification is only possible through interpretation of the perceived event, of something flying by (Maturana and Varela 1987).

The concept of schema contributes to an understanding of how bodies of knowledge are context-specific by nature, as they originate from processes of interactions with the environment and are organised through some kind of experience. This body of research contributes to an understanding of mental processes as significant dimensions of knowledge production. To this, however, we must add the social relational processes, including for instance those taking place within cultural practices and institutions that serve as mechanisms for validating and storing knowledge (Illeris 2000; Wenger 1998).

Thus, the making of knowledge has both individual and social dimensions. To generate knowledge according to this definition, it has to pass through individual *and* social and cultural filters. During these processes, it is subject to negotiation among different parties. Evoking the social and cultural filters, or rather mechanisms and relations, is what I refer to as the processes of institutionalisation of knowledge production. Illeris divides knowledge production<sup>28</sup> into two distinct sets of mental sub-processes and one social set of sub-processes: (i) a mental set of sub-processes of acquisition and adaptation; (ii) a psycho-dynamic set of processes, mobilising energy for and affecting the acquisition process; and (iii) a social relational set of sub-processes between the learner and the environment where learning is taking place. The cognitivist view of knowledge processes

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<sup>28</sup> I have taken the liberty of referring to Illeris' use of the term "learning" as knowledge production.

referred to above falls mainly within the scope of Illeris' (Illeris 2000) first and to some extent second set of sub-processes. The psycho-dynamic processes are vital to consider in order to understand the importance of the learner's perception of specific situations in which learning takes place and how they affect knowledge production. Illeris says that the psychic energy that is mobilised in relation to how the learning subject experiences, feels, and is motivated by a situation, has great importance for the quality of learning. Illeris refers to the psycho-dynamic processes as mental conditions for learning. This insight is relevant for the present research project, both in the sense that it strengthens the argument that knowledge production is inherently linked to context, and also for the very research process through which I aim to understand people's constructs of reality, including the reality constructed in interview situations. However, given my own research interests and background, the following analysis focuses primarily on relevant socio-relational processes and the context in which they take place.

Accepting that knowledge is subject to continuous negotiation between social groups and across space, as well as to changes over time means that its nature is non-essentialist. This does not imply, however, that knowledge is completely fluid. Knowledge is socialised through structures. In these structures, knowledge is negotiated. This process adds inertia to knowledge, giving it a dynamic of its own, and it thereby contributes to continuity and stability.<sup>29</sup> As knowledge is institutionalised, it has structural implications far beyond the circle of people negotiating it. Knowledge thereby becomes relational, historical, and both constitutive of and constituted by culture and society.

### *Reflection, negotiation, and interaction*

This line of thought is further explored by social constructionists, such as Burr (1995), Guba and Lincoln (1989), and McCarthy (1996). With roots in early sociologists of knowledge and their contribution to our understanding of thought and existence as activity that always links mental attitudes and knowledge production to action, McCarthy defines knowledge as

*... any and every set of ideas and acts accepted by one or another social group or society of people - ideas and acts pertaining to what they accept as real for them and for others... knowledges cannot be divorced from the historically specific forms of social intercourse, communication and organisation (1996).*

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<sup>29</sup> Therefore, not all new ideas or new ways of seeing things will be widely acknowledged within the context and the social groups they are directed toward, just as not all people have influence on all knowledge they employ.



Social constructionism is useful to explain that even though certain phenomena might be of an essential nature, we will never learn this, since every individual may interpret phenomena differently. Although individuals interpret differently, commonly accepted knowledge is established and informed through different types of institutionalisation of knowledge. People's interpretations are negotiated and may be modified, discarded, or accepted in this process. Knowledge of the world is therefore not derived from the nature of the world as it 'really is'. People construct it through daily interaction. Their versions of knowledge become fabricated in the course of their social life. Therefore, what we regard as 'truth', i.e. our currently accepted ways of understanding the world, varies historically and cross-culturally and is not a product of objective observation of the world, but of the social processes and interactions in which we are constantly engaged. If we understand 'reality' as consisting of a series of mental constructions and reject the idea of an objective reality 'as it really is', then only interactivity can lead to a construction or its subsequent reconstruction (Guba and Lincoln 1989). The different processes we engage in, and the different cultural schema we have developed and use for interpretations of phenomena, result in different views and even opposing 'truths' about the same phenomena. This is not to push aside the importance of the material context but to explain the significance of the ways we think about it.

The importance of action and interaction is further explored by Burr, who argues:

*Knowledge and social action go together. These negotiated understandings could take a wide variety of different forms, and we can therefore talk of numerous possible 'social constructions' of the world.<sup>30</sup> But each construction also brings with it, or invites, a different kind of action from human beings (Burr 1995).*

Vivien Burr argues that knowledge and action are inherently and mutually related, so that a change of one may lead to a change of the other. Following this understanding of knowledge production, we must study the process rather than the structure. Rather than trying to understand 'the nature of things', or the 'laws behind phenomena', constructionists suggest we look at *how* knowledge is achieved through interaction. A similar line of thought was expressed in Garfinkel's *Studies in Ethnomethodology* from 1967. He was among the first to introduce the idea that structures and systems are not real things but conceptions produced by people through interaction. Interaction, he argues, rests upon taken-for-granted techniques and knowledge, or what I refer to as routine-like practices. Giddens draws on Garfinkel to underline the notion of reflectivity. He argues that in giving a rational account of our actions, we are actually constituting them and the social world in which we live. We reflect constantly on what we are doing, incorporating

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<sup>30</sup> Burr's argument also explains why she and other constructionists, e.g. McCarthy, often use the plural form of "knowledge".

knowledge about our situation and ourselves, and changing our activities accordingly (Giddens 1984).

But everyone does not reflect equally upon all types of activities. Lots of activities are handled everyday without conscious reflection; we do them so often, or we do them so well, they become routine. This adds to the inertia of knowledge and the structural continuity I discussed earlier. Likewise, other activities present new or hitherto unknown tasks, which demand considerable reflection and other knowledge processes. Giddens helps us understand the differences between routine and research-like practices. Different types of practices affect different types of knowledge productions within different domains.

### **Institutionalising knowledge production - research, specialisation, and mechanisms**

The central argument made above that knowledge production involves a high degree of conscious reflection, whether by indigenous people in the Amazon forest, ecological farmers in Europe, or researchers in high-profile scientific research institutes. Given the vast, complex, and detailed character of such knowledge domains as plant names, uses, agro-ecological practices, or medicinal knowledge, two lines of inquiry follow: The first aims to understand the character of such reflective practices, and the second line of inquiry addresses issues of the cultural needs for specialisation into certain fields of knowledge, and the need for efficient institutions for learning, teaching, validating, discarding, and distributing this knowledge.

Beginning with the observation made about the universality of conscious reflection to knowledge production, not all activities and processes in any knowledge production involve the same kind or degree of reflection. Inspired by Giddens, I propose an analytical separation of knowledge produced by routine-like practices through so-called practical consciousness and knowledge produced by research-like activities, through a so-called discursive consciousness (Giddens 1984).

Giddens argues that experience and processes of interpretation are vital to both routine-like and research-like practices. However, while the tacit character of the knowledge which routine-like practices often draw upon, maintain, and develop is "*remembered by the body*", the research-like activities require active reflectivity (Halkier 1999). Both types of practices are fundamental to production, reproduction, and distribution of knowledge within and across domains. However, while routines contribute to the maintenance of knowledge and the sense of normality, the research-like activities may contribute to expand, break, or actively legitimise the boundaries of a specific body of knowledge. The more developed the reflexive capacity around action is, the greater are the possibilities for a person or society to change its way of acting. All people perform both types of practices in their

everyday lives. Still, the practices are not necessarily equally distributed, either temporally or by individual. Given the inter-cultural and intra-cultural variations, the differing principles of social organisation, and the unequal participation in social processes leading to the making of knowledge, this distinction raises empirical questions: If some individuals are more involved with research-like activities than others, then how does this involvement and the character of practices performed affect societal knowledge production?

Practices are activities carried out by individuals in particular ways. Routines are the continuous stream of activities that are taken for granted by the individual and rest on and function according to so-called tacit knowledge. In contrast, the research-like activities consist of intentionally chosen activities, which the individual can verbalise, and thus carry out on the basis of processes of reflection (Giddens 1984; Gullestad 1989; Simonsen 1993; *cf.* Halkier 1999). This, however, is not to say that the research-like activities only occur as isolated events which the individual can choose to let happen. Research-like practices are also part of the socio-cultural patterns or structures, if you like, of everyday life. These activities, contrary to routines, often make use of rules, whereas routines have no need for rules, as they are embedded in what is being done. Hence, routines contribute to the maintenance of a sense of normality; they add a recursive element to the concept of action and help to explain the reproduction of knowledge and, for that matter, rules and norms, which the more reflected research-like practices can assist in breaking or actively legitimise (Ilmonen 1997: 4-5; *cf.* Halkier 1999). One may hypothesise that in highly complex environments, such as biologically diverse tropical forests, the incentives for people to develop research-like practices on relevant domains, and not least institutions for their maintenance, are comparably greater than elsewhere – or following Agrawal (1995) and Spradley (1977), lead to specialised knowledge production within particular domains. This may in turn lead to a more general strengthening of local research-like activities. Finally, Giddens would probably argue that the more widely the specific research-like practices and analytical capacities in general are spread out socially, the better prepared the particular societies are to deal with processes of social change (Giddens 1984).

### **Knowledge institutions - developers and maintainers of shared meanings and reflexive capacity**

Social order, which includes institutions, exists in the minds of their members and others and is continuously produced through their activities, not least in dialogue and interaction with other people (Garfinkel 1967). The 'glue' of institutions, what keeps them from falling apart, is the shared meanings developed, maintained, and sanctioned among their members and affected outsiders. The institution is thus constructed and reproduced by its members and depends upon their

continued participation, whatever their motives are. People's participation is subject to competing offers and constraints within the social context of which it is part. The resilience of an institution is therefore subject to its continued relevance for its members. Institutions, however, like knowledge, do not necessarily change overnight. They too have a built-in, self-perpetuating dynamic shaped by routine-like activities and established, shared meanings. This inertia of institutions has a structural influence on people's activities.

The purposes for participating in institutions are naturally as manifold as the *raison d'être* for the institutions themselves. The institutions I am mainly interested in are those that more or less explicitly aim to maintain and develop knowledge processes and especially the conscious reflexive capacities of people and society. This is not to say that other institutions are irrelevant. Marriage, for instance, is highly relevant to knowledge production, although it is hardly its main purpose. Reflexive activity is evoked by the individual or with the help of others. When looking into the role of institutions with respect to knowledge production, this is the main angle: how institutions evoke, and are developed to evoke and develop, reflexive capacities. Reflection, and with it people's discursive consciousness, is often evoked through inquiry into a certain sequence of actions (Giddens 1984). Hereby, the individual becomes able to express and explain a previously experienced activity verbally, which in addition provides the opportunity to modify future activities.

Lave and Wenger (1991) contribute to understanding knowledge production<sup>31</sup> by exploring it from a relational perspective in which the shared meaning of an institution is negotiated among its members. Lave and Wenger introduce the concept of *situated learning*, which refers to an assumption that practices are always situated in specific people's lives and culture, whereby knowledge production is seen as an integrated part of a creative social practice, which in turn is embedded in complex societal relations. Thus, the knowledge institution is placed in a field between person and society, in which interests are represented and practices exercised in a continuous process, which at the same time secures the stability, social change, and survival of the institution (1991). Participation, as a complex social process, therefore becomes of imperative importance to learning. Access to participation in different processes can be made the object of inquiry, when specific individual's learning processes are to be analysed. Focusing on participation and access to institutions in which to participate has, according to Wenger (1998), serious implications for what is required to understand learning. For individuals, it means that learning is acquired through engagement in and contribution to the common historical and social resources, boundaries, and perspectives of institutions. For institutions, the focus on participation means that learning is about developing their common historical and social resources, boundaries, and

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<sup>31</sup> Specifically, within an on-going debate on learning.

perspectives, and securing new generations of members (*ibid.*).<sup>32</sup> From the common-sense idea that institutions and the people forming them have an interest in developing their knowledge of how to tackle a changing context, it follows that they also have an interest in strengthening their aggregate reflexive capacity. This may be achieved through strengthening the basic and specialised learning processes, by providing access to and encouraging participation in relevant institutions and practices, and stimulating and removing constraints from creative activities (Wenger 1998).

## **Conclusion**

Two important conclusions emerge for further empirical analysis, first that knowledge production in general is inherently linked to context; second that a high degree of conscious reflexive activity is common to most types of knowledge production

### **Context is universal to knowledge production**

To summarise, knowledge is processed information that contains meaning for a social group when related to context. Factual knowledge must be distinguished from the processes through which it is developed and continuously disputed/-negotiated and changed. This does not mean, however, that information which has been validated as knowledge in a given place and time cannot be extrapolated and transferred beyond context, but it remains 'information' and not 'knowledge'. For information to become knowledge, it undergoes transformation through different knowledge processes to make it fit new situations, places, and/or periods of time. Any group of people is to some extent heterogeneous, and different individuals will not necessarily transform information in the same way, and they will perceive and classify or discard the information according to the ways they transform it.

Concepts like indigenous technical knowledge, local knowledge etc. have often been dichotomised from scientific knowledge and its means of production and reproduction. The discussion in this chapter makes it clear that knowledge and knowledge production are related to action and influenced by special interests. It is employed as a political and social tool. The alleged dichotomy has been convenient and rather successful for political purposes, to indicate differences in

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<sup>32</sup> Institutions are different from organisations, mainly with respect to their degree of formalisation. For organisations, the relational focus on learning means that learning is about protecting the sustainability of the web of institutions and practices through which an organisation knows what it knows, and whereby it may become effective and of value as an organisation

relations of power and access to resources and to dispute scientific knowledge's claimed universality and patent on truth. However, in the course of this political project, relevant common elements, such as those shared by folk taxonomies or the work of a botanist or so-called natural healers and medical doctors, were often neglected. Unnecessary barriers were erected between those who might otherwise be able to learn from and strengthen each other's methodologies etc. In drawing the defining boundaries, advocates of local knowledge have often sustained their arguments by claiming substantive, methodological, and epistemological differences to scientific knowledge production. I argue that it makes more sense to distinguish between types and domains of knowledge and the different ways in which context influences their production, reproduction, and distribution. The production and reproduction of knowledge consist of social processes such as experimenting, observing, contesting, communicating, evaluating, validating etc. The composition and relevance of each of these processes vary with activity and location, for example the social and cultural organisation of material production and reproduction and the biophysical conditions. Knowledge is therefore dynamic and specific to context. The apparently closed character of a knowledge system or domain becomes open when people, as part of their practices, interpret concepts into a new context.

### **Conscious reflective activities are universal to knowledge production**

Knowledge production involves a high degree of conscious reflection. Special attention should be paid to the character of such reflexive practices, the cultural needs for specialisation into certain fields of knowledge, and the need for efficient learning institutions. Accepting that knowledge is subject to continuous reflection and negotiation between social groups and across space, as well as being subject to change over time means that it is non-essentialist in nature. This, however, does not imply that knowledge is completely fluid. Knowledge is socialised through structures. Within these structures, knowledge is negotiated. This process adds inertia to knowledge, giving it a dynamic of its own and hereby contributing to continuity and stability. As knowledge is institutionalised, it structures far beyond the circle of people negotiating it. Knowledge thereby becomes relational, historical, and both constitutive of and constituted by culture and society.

The empirical challenge is to identify central practices and institutions with respect to learning, and to understand their dynamics and relevance to the maintenance and development of knowledge of biodiversity. In this respect, it is not only relevant to deal with the knowledge we encounter, but also to understand the ways it is regarded and presented by different stakeholders. The focus must be aimed at how knowledge production is shaped (and constrained) by different cultural, socio-economic, and biophysical context-specific conditions, as well as at the political motives affecting how knowledge is presented.



## CHAPTER 3

### RESEARCH STRATEGY

#### **Knowledge production, livelihood, biodiversity – catching the process**

In this chapter, I present the main analytical tools that I employed during visits to the Colombian Amazon. The presentation falls in five parts. The complex problem of how knowledge is constructed and how it may change with social change requires a stringent and open-ended approach to avoid reproducing and imposing my own norms and categories. With this fundamental consideration in mind, I set out to reach a basic understanding of which relations to deconstruct and which phenomena and conditions to inquire into. In other words, I have undertaken a baseline study of the social, cultural, and biophysical conditions and sought to gain an understanding of motives, interests, conflicts, and learning processes involved in local natural resource management. Through a number of exploratory exercises, I qualified the choice of communities in which to do fieldwork. This was the **first** step.

When aiming to relate processes of knowledge production to something as multi-dimensional as ‘living’, the analytical endeavour of breaking it up into meaningful categories or strategies may seem difficult, especially when dealing with a culture which is only rudimentarily known to the researcher. Therefore, the only viable and meaningful approach is to use local criteria. Hence, in the **second** step of the methodology, I developed a technique to extract local perceptions of livelihood strategies. Through this venture, I provided for the identification of different salient types of practices, networks, and institutions. Furthermore, this technique provided a means to order the informants by these local criteria. In this way, I could target the subsequent in-depth investigation of the relations between livelihood, knowledge production, and social change. Hereby, I addressed biases of giving the social networks of the primary contact persons relatively more attention than other people. It also served to ensure optimal efficiency during the relatively short period of fieldwork (in comparison to many anthropologists).

In the **third** set of exercises, I further qualified the choice of key informants, households and institutions, key domains and types of knowledge, and the final choice of biophysical focus, both spatially and biologically.



The **fourth** step was to start different series of both quantitative and qualitative exercises, collecting cultural “facts” and individual-level “stocks of knowledge”, understood in Schutz’s (1971) open-ended and incomplete sense as not static. The processes and the interests leading to the fabrication and maintenance of the “facts” were then tracked. In order to do so, I undertook open-ended conversational interviews: joint sessions of transcription and interpretation of cultural narratives; and the collecting of life histories. By following these, I explored the social processes involved in the reproduction of salient cultural institutions. The kind and composition of research-like and routine activities were followed continuously throughout the fieldwork.

Finally, the **fifth** step was to develop and perform what might be called an exercise of “confrontation of cultural constructs”. The main motive was to extract and provide an opportunity to discuss overall cultural constructs of knowledge and their production, reproduction, and distribution. Naturally, it also served as a triangulation mechanism for my own understanding of their view of “knowledge about knowledge”.

## **Research process**

After having discussed and negotiated the first terms of access to two regions of potential interest with the relevant national and regional authorities and held meetings with research institutions to qualify and select a number of potential research locations, the next step was to get to the field sites. I spent a total of seven months doing fieldwork in two communities. My visits were spread out over a period of 2½ years, from the summer of 1995 to the autumn of 1997. The eight visits to the Araracuara region, which varied in duration from 16-35 days, were spread out over the year in order to be able to follow cultural and production-related activities.

There were several reasons for choosing to break up the fieldwork period into shorter intervals rather than staying for one long period. While I was not in the field, I worked as visiting researcher at the International Centre for Tropical Agriculture, CIAT, in the Colombian Andes, and was affiliated with the national research institute, Sinchi, which had 20 years of experience working with the Colombian Amazon. Once a year, I returned to CDR and RUC in Denmark to teach and meet with my supervisors. This arrangement provided me with a lot of flexibility in terms of planning and being able to react to special events and new ideas. I was thus able to go into the field for two to five weeks to try out and finish the various exercises, and then return to the research institutions named above to analyse the results and plan how to continue. The second advantage, which may also be the most important, was that I was able to follow cultural, social, and bio-

physical processes over a longer period of time. By this I mean both everyday life activities and decisions that were being negotiated, made, and implemented, for example, in relation to the three annual production cycles I witnessed, but also the events that mark important periods in people's lifecycles. One example is the cultural careers of the region, which are named through dances that celebrate graduation from certain knowledge domains. These are held at 6-12 month intervals, and I was able to participate in a number of them, which resulted in a growing understanding of their complex nature. Not least significant, the working relationships I enjoyed with people there developed favourably from visit to visit. The people I encountered and worked with in the region got to know me as the guy who "asks a lot – but not for too long to get bored". Finally, it turned out that my way of coming to a place, staying there long enough to make my rather precise inquiries, start and finish the limited number of exercises I carried out during each trip, coincided with some of the basic principles of their cultural learning system. Knowing how to ask, to stay on track, and not least to demonstrate seriousness by returning repeatedly to the region in order to follow up apparently assured them of my true interest and good intentions. Quite a stroke of luck, considering that the very good working relationships I experienced by the summer of 1996 were not necessarily what I expected just a few months before.

*Text box 3.1: The process of identifying and negotiating research locations*

During the process of getting my project funded, I visited relevant national and regional institutions and authorities and was invited to participate in the national dialogue on indigenous peoples' knowledge and rights concerning biological diversity. I was also invited to do fieldwork in two regions, Putumayo, near the border to Ecuador, and Araracuara, some 600 km further to the East (Kronik 1995). Once I received the funding, I visited the two regions to plan and negotiate the terms of my research. In both places, I completed the first steps of my research strategy, mapping resources, actors, and their practices. In Putumayo, the situation, with social unrest and the lack of the presence of the state, is very different from that of Araracuara. Official statistics say that 95 percent of all cultivated land was covered by coca leaf production. So everybody, except those from the Cofán village I was to work in, was deeply involved in the drug business – they lived and survived by it. Settlers, who exerted strong cultural and economic pressure on the indigenous group, surrounded the indigenous reserve with their land-expanding and -demanding form of production. The guerrilla, who protected and 'milked' the coca producers and traffickers, upheld 'law and order'. To get to the village, we had to pass three laboratories. I was to collaborate with the Ministry of Health's malaria patrol, which was the only state agency allowed in the area, on a very interesting programme on potential fields of synergy between indigenous and scientific medical knowledge. In accepting to work in the area, I had weighed the security situation and felt comfortable and inspired to be working with a highly

respected community leader and with the visionary leader of the Health Department to study the violent “battlefields of knowledge”. This was an opportunity I would rather not miss. However, the situation became worse during the summer and autumn of 1995. Substantiated rumours had it that the President could no longer block an airborne campaign of spraying herbicides (*Glifosat*) to combat the coca problem, now that the new Chairman of the important US Senate’s Foreign Affairs Committee was a right-wing Republican (Senator Jesse Helms). The coca producers and the guerrilla organised themselves and took over the most important cities and the infrastructure in the Department of Putumayo.

Therefore, I began to look for a second community in the vicinity of Araracuara. This would strengthen the project logistically and methodologically, save travelling time, and provide other and probably better possibilities for analytical comparison, since there would be a higher degree of common culture and direct forms of influence between the two communities.

I visited four communities upstream from Araracuara on a two-week trip with the president of the regional organisation for indigenous affairs, CRIMA. This did not turn out to be as easy as I thought. Although I learned something during the eight months of intermittent negotiations with local and regional organisations, it was beginning to stress my otherwise flexible set-up. The meetings and the subsequent communication demonstrated three things: First, people in the region have good reason for a general unwillingness to take on a tedious research relationship with inquiries into the personal realm without getting anything in return. Second, they expressed general suspicion due to bad experiences with ‘white’ people (including violent encounters with Colombian and Peruvian institutions). Third, there was confusion among the young leaders of local and regional organisations about the different national signals regarding the value and exploitation of indigenous peoples’ knowledge by rich companies that made profit from their ancestral collective property. I have experienced several examples where they were invited to national-level conferences as hostages of a state that has an interest in showing that it does ‘something with the Indians...’ while at the same time inviting representatives from pharmaceutical companies to discuss multimillion dollar investments and profits. No wonder they are confused, as they have rarely earned anything on the basis of their ancestral knowledge, and no wonder they are suspicious when meeting a researcher who wishes to study how their knowledge evolves and is learnt.

## **Achieving a bird's eye view of social, cultural, and biophysical conditions and relations**

The first step in my research strategy was to develop a brief overview of the social and cultural relations and practices. In addition, I needed a basic understanding of the biophysical conditions they draw upon, to be more precise, a view of the state they are in; how the resources are being used, conserved, and/or overexploited; and which changes have occurred over time and are taking place as a result of human activities. To achieve this, I carried out a number of mapping exercises in Putumayo and Araracuara, and later in Chukik+, supplementing these with what I could gather from literature.

Having acquired census data,<sup>33</sup> I walked the area of Araracuara and Putumayo with an elder in each place, drawing (and geo-referencing) maps of the area. We drew most of the forest fields (a few hundred of them), indicating their approximate age from the time they were cleared and sown; streams; most distinguishable landscape types; and houses, communal buildings etc. At a later stage (during step 4), I gathered more detailed information on the content and stages of production cycles.

Together with CIAT's GIS lab, I produced a few maps to inform the spatial dimension of the analysis and inquiry. The maps were further used for a discussion of the various strategies employed by households and individuals. We focused on a number of the most different types of households that the elder person could think of in this respect, trying to extract as wide a range of strategies as possible. Subsequently, I visited some of these households to learn more about their uses of the natural resources. This was however still at a very superficial level. Then, we discussed their apparent motives for performing these strategies rather than other ways of managing the natural resources. In this way, I was able to establish some moral indications of how to 'live the good life', what to do, and what not to do. This helped me prepare for the subsequent explorative household survey on practices, networks, and types of resources used for different types of production and reproduction.

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<sup>33</sup> The information was cross-checked with the state employee, *el corregidor*, and later with a community leader. Census information in Latin America can be highly unreliable, as it often reflects political struggles for land and public resources.

*Text box 3.2: The fruit plantations as a salient element in some livelihood strategies*

An important insight from the exercise in Araracuara was learning about the status and the respect the *anciano* (elderly person) had for experienced users of the indigenous production system, as those who provide people with protection against pests, diseases, and food shortages. In brief, the system consists of annual clearing, burning, and sowing of a high forest plot, and annual clearing of a small secondary forest plot, to store seeds *in situ*. In the main field, the *chagra*, food staples like sweet and bitter cassava are planted together with up to 70 species of fruits, vegetables, herbs, and ritual plants like tobacco and coca. Once the staples are harvested after two years, the fruit trees and palms begin producing. They provide fruits in succession at different intervals up to 35-50 years. Due to increased pressure on the land, people are increasingly shortening this period, which mistakenly has been referred to as fallow. The system is common to large parts of the Amazon. The possible long-term effect of this system on the ecological character of the forest has led some researchers to conclude, in a much disputed article, that large parts of the Amazon are anthropogenic (Balée 1989). However, that is another story.

By June and July 1996, the local research permit was confirmed and the work in Araracuara was intensified. A leader of the Araracuara community proposed that I should visit the upstream village of Chukik+, where many had relatives. At this stage, I had proceeded with the work in Araracuara with a more detailed exploratory inquiry into the social, cultural, and biophysical realms. At a meeting in the *maloca* of the Clan of Drums with clan leader, Mariano Suarez, and representatives from all three clans of Chukik+, it was decided that I should perform a sort of pilot study. I spent a few weeks there repeating the above mapping exercises and making exploratory inquiries.

The aim of the exploratory inquiries was to qualify a subsequent choice of key informants and households for in-depth analysis. They were to cover the widest possible range of livelihood strategies. Furthermore, the inquiries were to inform a later, larger scale conversational questionnaire on the linkages between livelihood strategies, knowledge production on biodiversity, the importance of participation in local institutions, and the influence of different processes of social change. I also needed to select a culturally salient segment of the overwhelming biological diversity, and to make an effort not to leave out important dimensions of the cultural and social organisation of production and reproduction.

With the help of a community leader, three households were selected from Araracuara representing three distinct lifestyles. In one, recent migrants from far upstream, the man works in the hospital as a nurse and the woman depends on recently established women's networks for access to seeds, labour etc. Another

household was chosen because they live entirely from their own production and participate actively in cultural institutions and networks. The third household depends entirely on income from non-indigenous institutions and petty commerce. In Chukik+, the community council suggested that I should work with each of the three clans in turn. As each clan only consists of one to four extended families, I decided to work with a complete sample.

The exploratory exercises consisted of 'mapping' everyday-life activities and practices, which I undertook during the 3-4 days I stayed with each household/-clan. The principal techniques I used were participant observation and endless open-ended inquiries into cultural and socio-economic issues. These were supplemented by a number of exercises specifically directed towards a particular problem or field of analysis. I paid particular attention to the role of different segments, such as gender, age, kinship, status, and ethnicity, and to people with particular relations and interfaces to market-based institutions and flows. Some of the activities I followed are carried out individually, others collectively. While both are important for knowledge production, they often contribute with different aspects and in different combinations of knowledge processes, including varying composition of research-like and routine-like practices. To capture these processes and practices, I made a special effort to map participation in activities carried out by different networks and institutions based on kinship, friendship relationships etc.

As concluded in chapter two, it is relevant to break up knowledge production into several domains, and to study different types of knowledge, knowledge processes and systems within these boundaries. The exploratory exercises were thus also designed to inform the criteria for selecting one or several domains for further in-depth analysis. This entails establishing an overview of all or at least as many as possible of the domains directly and indirectly relevant to use and conservation of biological diversity.

### **Eliciting local perceptions of "livelihood strategies"**

Through the exploratory inquiries, I managed to get a good sense of the strategies pursued to maintain or achieve the ways of living sought by different people. However, these results were still too vague to use analytically, both in order to pinpoint key dimensions of different livelihood strategies and even less to classify people according to them. One thing seemed certain. There were several different strategies present, even within a single household. In fact, individuals demonstrated that they drew on different strategies in order to deal with different situations. It did seem, however, that they were mostly inclined to one strategy. Based on this

information and the conviction that knowledge is borne by the individual, I made the individual the level of analysis, and not for instance, the household.

But how do we understand this concept of livelihood strategy, and is it possible to break it up into operational terms to enable a study of its dynamics? Will we thereby be able to understand the interplay between different dimensions in order to discover how some groups of people within a society or culture, who pursue/-live different livelihood strategies, encounter certain local and other institutions and actors? And can we determine whether all this is essential?

At this stage of fieldwork, I set out to develop an exercise to address these questions, especially aiming to:

- Elicit local criteria and principles that determine people's livelihood strategies.

At the same time,

- Classify my primary sources of fieldwork information by these same criteria.

And finally,

- Achieve a useful order of these groups and individuals for subsequent statistical analysis of the impact of following certain livelihood strategies for the production of knowledge and utilisation of biological diversity.

The names of each person in the sample were written on a numbered card. A total of 58 individuals were sampled according to maximum variation of the sampling factors assumed to have an impact on the livelihood strategy of people in the area, such as age, sex, kinship, ethnicity, social status, and the community to which they belong. Then, six informants were selected from this sample according to the same criteria. They were visited individually and asked to sit with me alone for an hour and sort the cards in categories according to "how people think, act, feel, relate, and produce". After the man or woman had sorted the randomly shuffled cards into a number of piles (in this case, from three to eight piles), he or she was asked to check the piles again, making sure they fit. Subsequently, they were asked to tell the interviewer in which ways the first pile differed from the rest, and why he or she had put the cards in the same group. The descriptions of each pile were written down meticulously, and at the end, the numbers were noted (see Annex 2).

One of the central questions I have encountered in regard to this exercise is the feasibility of establishing an order among the livelihood strategies, and whether the logic of this order will be more than an accidental weighing of certain criteria mentioned to describe a group of people. It is possible that the informants developed the classification according to a logic specific to the situation and the moment in which the exercise was carried out. This could mean that the classifications would differ substantially at another moment or in another situation, or even due to the sequence of the cards in the original pile. Livelihood strategy is a multi-faceted concept which may cover as diverse dimensions as how people relate to

each other, how people produce, how they participate in social gatherings, their roles and obligations, if any, within and outside the community etc. These criteria, unlike e.g. levels of well being, may not follow the same linear logic. Would the person interviewed have ordered the sample differently if only asked to put the cards in piles according to one facet of livelihood, e.g. according to production? I have run both qualitative and quantitative tests to study the information derived from this exercise in order to discuss why it makes sense to use it for further analysis (see chapter five).

## **Deciding who to interview, and what to talk about**

### **Institutions**

Four salient cultural institutions emerged from and/or were emphasised in the livelihood strategy-descriptions introduced above. The kind and degree of participation in these institutions emerged as significant indicators of people's ways of living, defined as how they think, act, feel, relate, and produce. Now, it was possible to concentrate on:

1. Work relationships, among these the cultural institution called *minga*,
2. A special forum for reflection, communication and ritual practices, the *mambeadero*,
3. The political/administrative institution of local government called the *Cabildo*, and
4. The educational ritual institution referred to as the careers of dances.

The possible relations between these types of participation and involvement in different knowledge processes could also indicate differences in the distribution of factual information contained in the different types of knowledge of plants. This was followed closely during the subsequent series of interviews, during participant observation, and while listening to and transcribing ritual narratives. Furthermore, this was addressed to the extent possible during public planning meetings and events like the cultural dances.

In the analysis carried out during and after fieldwork, I gave particular attention to the following expressions of institutionalisation:

1. Dissenting opinions from the contact with non-indigenous actors and other 'non-members' of the institutions.
2. The processes of negotiating the relevance and truthfulness of certain types of knowledge and incoming information.
3. How they assert different forms of power.



4. Historical view of the institution, including a particular focus on processes of change.

- What is going on, i.e. what is the institution a framework for?
- How do the people involved learn?
- How do they express that they gain knowledge?
- Is the institution or are the knowledge processes formalised?
- Which are the principal historical changes seen in light of the above?

### **People**

The livelihood strategy exercise, which resulted in useful information at the level of the individual, served to qualify the selection of informants for in-depth interviews (N=16). The number of informants relates to what is referred to as the law of diminishing returns. Originally, I had made a list of 24 persons, but as the interviews went on, I gradually found out which topics were being exhausted. In other words, after 16 interviews<sup>34</sup> very little new information was presented to me, so I decided to stop the interview series and concentrate on other activities. The livelihood exercise was also instrumental in selecting a larger number of persons (N=41) for collecting ethno-biological information aimed at a systematic test of my hypothesis of the correlation between ways of living and knowledge produced and maintained on biodiversity.

### **Biophysical categories and cross-cutting domains**

Before starting fieldwork, I had been advised by natural scientists to focus my research object by selecting only one plant group. This was certainly a good suggestion. They had recommended choosing palms as the plant group, as it provides obvious advantages over many other plant groups. The choice of palms does not limit the choice of use-category, as many species within this group are used in all relevant use-categories and knowledge domains, i.e. food, crafts, and ornamental production as well as medical and spiritual activities. At the same time, palms have the advantage of being easily identifiable through use of photographs or illustrations, thus facilitating fieldwork and the treatment of research data. However, I postponed the final decision until I had carried out a systematic ethno-biological

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<sup>34</sup> With persons covering the range of relevant segments and livelihood strategies. The interviews were only meant for qualitative and not quantitative analysis. To make a statistical multivariate analysis of all relevant segments would require a complete sample of the two populations, given their relatively small size.

mapping of plants. I undertook various sorts of the so-called free-listing exercises on 'important' plants with different members of the six households, after having made a domain analysis (see Spradley 1979 for a full description) with a group of individuals, categorising 'everything growing'. The group was established according to the principle of maximum variation.

Hereby, I established domains and categories for further in-depth analysis. Palms did emerge as a local category within both villages.

*Text box 3.3: Palms – importance in general and in the locality*

Recent research from the Amazon underlines the pivotal importance of palms among indigenous peoples (Balée 1989; Balick 1988; Balslev and Barfod 1987) and *mestizos* (Phillips and Gentry 1994), both culturally and in terms of local and regional economy. Palms thereby provide the material basis for the study of relevant processes leading to the production and maintenance of knowledge on functional biodiversity as well as for studying how such processes are related to the social organisation of production and reproduction. But there are further reasons for focusing on this plant group. Palms are relatively uncomplicated for the non-botanist researcher to identify, since they differ morphologically from other plants (including trees). Given the morphological character of palms and their economic importance as the source for a large variety of uses, palms are often a well-established plant domain within folk taxonomies. This is also the case in the study area in and around Araracuara, Colombian Amazon, where palms are a rather well defined plant group for both the Muinane and the Uitoto (Kronik *et al.* 1999; Sánchez Sáenz and Rodríguez 1990). With 26 genera and 64 species in the region (Galeano 1991), the plant group is of a reasonable size, with rich but manageable inter-species and intra-species variation.

The Muinane subdivide *suuno* palms into 13 subgroups (Kronik *et al.* 1999). The Uitoto seem to have no term for palms. In the ethno-biological classificatory system of Brent Berlin (kingdom, life-form, intermediate, generic, specific and varietal), palms as a group would fall into either life-form (like vines, grasses, trees) or the smaller group of generics coined intermediate. Much folk taxonomy lacks names for the categories of kingdom and intermediate (Berlin, Breedlove and Raven 1974; Berlin 1992).

From a free-listing exercise (N=25), it was determined that the domain of palms is salient, i.e. culturally significant and easily recognisable. This helped define and delimit the domain of palms and their uses. According to Martin (1995: 214), an inquiry with approximately 20-30 people is required to give a free list for medium-sized domains such as palms and palm use categories cited by the Muinane and the Uitoto of around 100 items. So a stratified sample of 25 persons

from the two communities was asked to list 15 palms and their uses. Forty-seven different palm species and a total of 101 use categories were named during this exercise.

Free listing also provided a first understanding of the relevance to knowledge about palms of certain dimensions that were assumed to be important to the organisation of local livelihood. These were gender, ethnicity, age, and occupation, social and cultural status, and access to forest products and the market.

It can easily be imagined that some people deliver a less complete list than they are actually able to. There can be many reasons for this: lack of time, lack of confidence, shyness, culturally insensitive behaviour on the part of the researcher etc. To avoid this, a strict and conscious approach is required, as in all interview situations.

### **Distribution of knowledge – establishing and maintaining facts**

Therefore, a series of both quantitative and qualitative exercises establishing cultural facts and individual-level stocks of knowledge<sup>35</sup> were initiated. The processes leading to the manufacture of and the interests in maintaining the facts were then traced in open-ended conversational interviews, and joint interpretation of cultural narratives and life histories, relating them and the social processes involved to the reproduction of salient cultural institutions. The kind and composition of research-like and routine-like activities were followed continuously throughout fieldwork.

To discuss qualitatively based notions concerning the explanation for such distribution of knowledge and help to further understand the impact of contact with modernity, an ethno-biological exercise was carried out on a plot with 23 different palm species after the series of qualitative inquiries. Given the larger sample (N=41) and the concreteness of the situation, the exercise should enable a more accurate exploration of the distribution of ethno-botanical knowledge among people in the two communities than the free-listing exercise.

Palms were sampled and collected to reflect both high and low cultural importance, access (i.e. closeness and remoteness), and the various eco-zones in the region, including cultural and more natural landscapes. Out of the 23 palms selected, 12 were randomly selected from the 20 highest-ranking palms in the free listing exercise in relation to cultural importance. The remaining 11 palm species were more remote and rare palms randomly selected from a list of all palms in the region, excluding the 20 most important (see Kronik *et al.* 1999 for botanical

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<sup>35</sup> Understood not in a static sense, but in Schutz's (1970) open-ended and incomplete sense.

references). Then, a nearby plot, a 30-year-old *chagra*, was found where 13 of the palms already grew. The remaining 10 were brought there from within a walking-distance of 1-5 hours and replanted.

The plot was prepared by one of Araracuara's two traditional counsellors, Aurelio, who is Muinane, and his Uitoto wife, Alcira. Both are trilingual. Afterwards, the palms were numbered and their botanical names were noted with the assistance of Galeano's book (1991) on palms from the region. Before we could start the exercise, however, Aurelio demanded that the work should be authorised by the elder Uitoto counsellor, thus assuring validity. In this way, Muinane and Uitoto names were listed and the information triangulated.

Each of the 41 persons<sup>36</sup> involved in the exercise were asked individually, at a convenient time during a period of two weeks, to (i) identify the palms by name (Uitoto, Muinane or vulgar name) and (ii) indicate the services they provide (uses). They were compensated for their time with money payment appropriate to local conditions. 'Paying for knowledge' is a culturally sensitive issue locally. However, compensating people for their time and effort is only reasonable and can be dealt with cautiously. It is not uncommon in this part of the world (see Berlin 1992; Phillips and Gentry 1993).

The conversational interviews consisted of approximately 40 questions concerning some eight themes. Attention was given to establishing a fruitful interview situation, relaxed but focused, preferably under only four eyes. Given the abstract nature of knowledge, I sought to ground or concretise the situation at the beginning of each interview. I did this by asking the person to begin by selecting one palm that he or she considered important. Whenever relevant and possible, I would link abstract ideas to the use and conservation of this palm or other plants or techniques. The themes around which we talked were:

- a) The importance of the particular palm and factual knowledge about its use and conservation;
- b) Knowledge processes and epistemology;
- c) Motivation and factual knowledge;
- d) Institutions and rituals;
- e) Access to knowledge and plants;

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<sup>36</sup> Forty-one persons were then sampled according to their dominant livelihood strategies, taking into account representation of the criteria identified in the free-listing exercise (stratified considering gender, ethnicity, age, occupation, social and cultural status, and access to forest products and the market). The sample consisted of 16 women and 25 men. 40 of them were between the ages of 18-78 (a 14-year-old was omitted from the age analysis). 18 were Uitoto, 22 Muinane (and one "other" was omitted from the ethnicity analysis). 25 lived in the "centre" village of Araracuara and 16 in up-stream Chukik+.

- f) Social aspects and history of learning processes;
- g) Economic values, income, and market-oriented strategies;
- h) Migration and contact;
- i) Questions about the merging of and confrontations between different knowledges and their methodologies and epistemologies.

These broader inquiries were followed up and informed by a series of in-depth interviews with these same people, mixed with life histories and inquiries during walks in the forest and/or during work in the *chagra* and *rastrojos*.

During the night-time, I asked for and recorded a number of ritual narratives, which I transcribed and discussed and had interpreted by various close contacts.

### **Confronting cultural constructs**

During the summer of 1997, I participated in a conference on action research<sup>37</sup> and was inspired by constructionist inquiry as discussed by people like Yvonne Lincoln.<sup>38</sup> This inspired me to try out a research strategy that modified the open-ended approach, which I had followed so far, into what could be called a confrontational constructionist approach. The results were remarkable. While travelling the two days to get to Araracuara from the conference at Cartagena, I worked on a small presentation of my construct of the learning system among the People of the Centre. After arriving in Araracuara, I first tried it out with a group of close contacts to see what kind of reactions might arise.

The idea was to present my construct of their knowledge system and the learning processes involved in as much detail as possible to different segments and institutions in order to modify misconceptions, focus my study, and most important, extract different local constructs of learning processes and knowledge production from the responses to the exercise.

Naturally, this exercise would not have been possible without my prior open-ended inquiry, participant observation, and the hard work of establishing good working and personal relationships. Perhaps, it would also have been less fruitful in areas where people are not as articulate and conscious about their knowledge

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<sup>37</sup> The World Congress' 4<sup>th</sup> Conference on action research, action learning and process management and the 8<sup>th</sup> Conference on participatory action research: Convergence in knowledge, space and time. Cartagena, Colombia, June 1-5, 1997.

<sup>38</sup> I am grateful to Helle Munk Ravnborg for bringing my attention to this material and line of thought.

production and more or less systematised learning processes. This was only one of several rather unique types of triangulation of the various sorts of complex cultural information I gathered during the time I was in the area. Another example was the process leading to the publication, “Fééjahisuu – Palms of the Grandchildren of the Centre of the World” (Kronik *et al.* 1999). During the process of establishing, finding, and describing the range of palms known by the Muinane, I went through the information with individuals at least a dozen times. Finally, a forum was established where the three clans agreed upon the content of the book after having negotiated intra-cultural variations in the names and classificatory order of the 80 palms.

Another example of these cultural responses and the verification of parts of my work is the video and the forthcoming broadcast version, “Yuak+, the Dance of the Fruits of the Earth”. Yuak+ is the cultural career that I was fortunate to have the opportunity to become rather closely acquainted with. In addition, I was asked by the owner to document it for them on video (Kronik 1997) as a reciprocal gesture “to cool down my act of leaving the area, taking out their knowledge” (Besario Castro 1997). Making a video entails many of the same fieldwork methods and editorial choices about what to record, what to leave out, and which context the different types of information should have, as making a written publication. During the preparations of the dance (held in September 1997), I collected and sometimes filmed a number of narratives, discussions, ritual dialogues, and individual viewpoints. These, plus the songs and riddles performed during the dance, were discussed thoroughly with my ‘process advisor’, Aurelio Suarez, who helped explain and interpret during the days following the dance event. Parts of these sessions were filmed, and all the recordings were then shown and discussed with several of the participants. The final version of the video, which was first mostly intended for local use, was shown and discussed half a year later. It was well received, although Aurelio felt that something was missing, and that the product deserved to be made in a better quality. This resulted in an invitation to come and film a later dance meant for a larger audience. Due to guerrilla activity, these plans were postponed until November 2000 (Kronik and Krøyer 2001). These examples of key persons’ and key groups’ continuous validation of my knowledge, which is referred to by Kvale as an “intersubjective agreement”, increase the value of the results. This concept is a reflection of the current emphasis within the social sciences on regarding truth to be negotiated in a local context. Hereby, the interpretative community is extended to include the subjects investigated and the lay public.

*Communicative validation approximates an educational endeavor where truth is developed in a communicative process, with both researcher and subjects learning and changing through the dialogue (Kvale 1996).*

Before continuing to the presentation and analyses of knowledge production in the Araracuara region, let me present the construct I developed of the knowledge

system. This gives an indication of the complexity of the system and helps to understand the various types of communication used in the region.

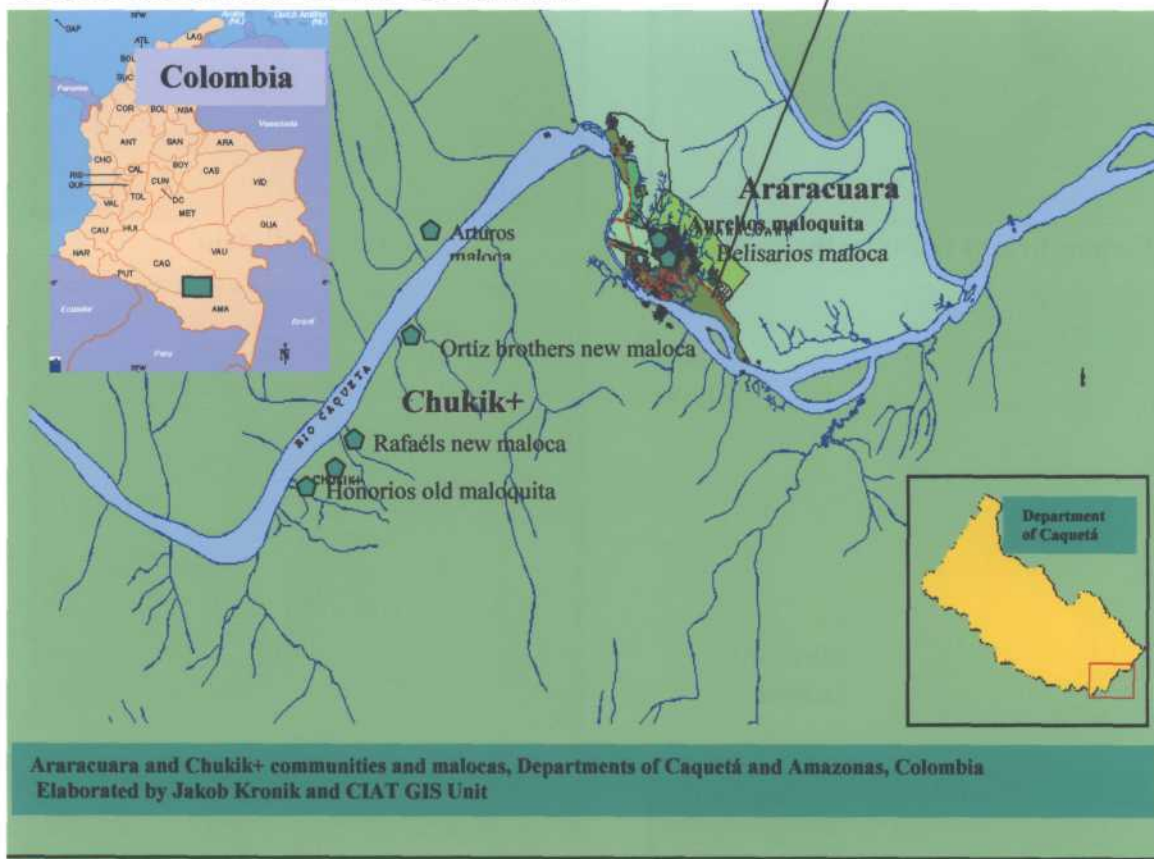
*Text box 3.4: My construct as of 6 June 1997*

1. To know well you must ask. One of the most essential and most often stressed ways to acquire 'good' knowledge is the idea that knowledge is best received if it is born out of personal interest. This interest can be stimulated, of course, but must come from the person.
2. Top-down education in which a person who considers himself or herself to be knowledgeable in a particular field takes the initiative to inform another person by telling and/or demonstrating. According to people in the region, this way of knowledge acquisition is less effective. This form of knowledge transmission is seen everywhere, within all kinds of social relations and situations. Therefore, it is also seen in the cultural institutions like the *mambeadero*, where it is systematised as a formal learning procedure. Top-down teaching is to varying degrees an element in two important formal procedures in the *mambeadero*: the night-time ritual *narratives* and *dialogues*.
3. Ritual *narrative*. The ritual narratives can be understood as the theoretical foundation or framework to understand everyday and more fundamental phenomena. It is held by a cultural authority, i.e. the 'owner' of the *maloca*, the traditional counsellor to the community, or someone (not anyone) brought in from another *maloca*/community.
4. The ritual *dialogue*. The dialogue is the analytical forum in which particular past, present, and mostly immediate future aspects, needs, and problems are dealt with.
5. To observe. Seeing and reflecting consciously and subconsciously other people's actions, results of actions, and any phenomena.
6. Experiments and discoveries. The experiments are related to practice, that is, daytime activities. These are conscious acts of trying out information received or exposed to on prior occasions.
7. "Little by little" without direction – one will eventually learn.
8. "Need to know" immediately and as preparation for following 'life-cycle-obligations'. Storage, remembrance techniques: in songs, narratives, and routines.

**Belisarios maloca**



## Araracuara and Chukik+





## Places and persons



**Isle in the Rapids of Araracuara.**



**View of Araracuara**



**Woman brings fruits to the maloca**



**Young Belisario**

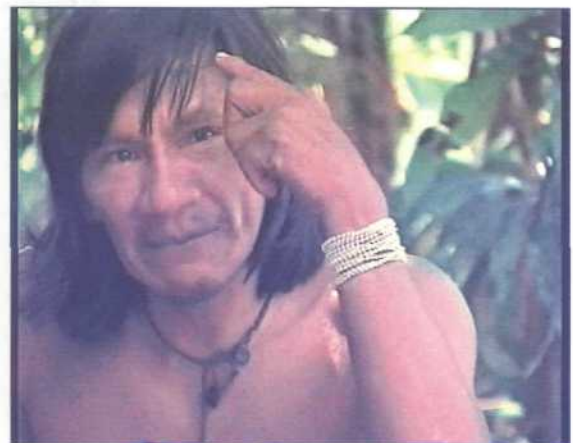


→  
**Juana  
Suarez**

←  
**Mariano  
Suarez**



**Pulls cassava tubers in the chagra**



**Aurelio Suarez**

## CHAPTER 4

### A PLACE FOR LEARNING

In this chapter, I set out to establish the importance of place to the production and distribution of knowledge – in other words, the relevance of biophysical conditions, social relations and the organisation of activities. I begin by introducing ways in which people of the region organise their daily livelihood strategies. Then, I extend this into an analysis of the relevance of dividing the population into analytical segments, such as gender and age, for the distribution of knowledge on plant diversity. A positive relationship should not come as a surprise to readers familiar to the debate, but is a necessary prerequisite for further research into the relations between knowledge production and cultural models, institutions and practices.

#### Living and organising

In this section, I present and discuss the individual strategies and relevant examples of collective action found in the region. The aim is to understand the character of different types of social organisations and other relevant dimensions of living. I start out using the *maloca* as the setting for the analysis and an example of a cultural space for exercising and promoting collective action and socialised learning.

#### The *maloca*

A *maloca* is a large palm hut covered with braided palm leaves.<sup>39</sup> It is a residential unit comprising a couple, referred to as the owners, and other family members such as widowed mothers or mothers-in-law, and the brothers of the male head of household and their wives and children. Nowadays, few people use it for overnight sleeping. The *maloca* provides protection from the sun, the rain, animals, insects – and spirits. It houses important cultural institutions like the *mambeadero* and the *ritual dances*.

Having or having had a *maloca*, or being affiliated with one, provides a certain amount of status and respect. The *maloca* is ideally a self-sustained unit, through

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<sup>39</sup> *Lepidocaryum tenue*

which its inhabitants and closely related neighbours and kinship alliances seek to manage and distribute available resources. It is the obligation of the owners to ensure the abundant availability of foods and ritual substances. Without these, it is not possible to celebrate the ritual dances, which mark the progressive development of the group in terms of increased capacity to deal with problems of any nature. The level of capacity and thus of status is partially reflected in the architecture of the *maloca* in terms of shape, number of pillars sustaining the palm roof, and the size. The shape of the *maloca* is compared to the human body. Tradition says that the human body stands quite firm on two legs (or two pillars) but much more solidly on four. This means that the 'masters' of a *maloca* have the necessary knowledge, skills, and autonomy to act upon the world and deal with any kind of problem.

The *maloca* has been referred to as a communal house (Echeverri 1997). However, translating the concept into communal house may give false associations concerning authority and decision making. The graduated *masters* or *owners* (a 'married' couple) exert the authority, assisted by a traditional council, and have autonomy in their part of the 'world', both in a cultural, social, spatial, and temporal sense. However, the extent of this power is continuously negotiated.<sup>40</sup>

### **The making and maintenance of authorities and institutions**

#### *Historical process of revitalised identities and cultural political struggle*

For a couple to become rightful 'owners' or 'masters' of a *maloca*, they have to complete an education that takes several years. The study period may not outlast the roof of the *maloca*. The roof will keep out rain for a period of 5-10 years, depending upon the quality of the leaves, the braiding, and the amount of soot from the smoke of many bonfires on the inside of the roof of the *maloca*. If their study is not completed and the owners have not graduated by the time that the roof needs to be changed, they must begin from scratch.

Undertaking this type of study means accepting certain public obligations, and as the study progresses step by step, it also provides increasing rights to exercise social control, including a strong say in the kinship groups and/or the community's use of natural resources and organisation of production. The traditional societal function of the *maloca* owners is to provide their clan, closer kin group and/or community with protection from dangers from the outside, often represented by diseases affecting humans, cultivated plants, and game animals. They also have a duty and a right to ensure that ancestral knowledge and inherited plants are

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<sup>40</sup> Persuasive discourses founded in ancestral knowledge often have no other practical relevance than to maintain, strengthen, or dispute social positions

maintained and passed on. Hence, they have a responsibility towards securing an equilibrated fertility and abundance of crops, game and humans.

My point is that the *maloca* owners are delegated responsibility for the protection, development, and use of specialised knowledge. However, they also have to acquire and maintain high quality all-round knowledge on how to deal with any kind of problem. As Mariano enjoyed stating in his *maloca*, “in your universities you specialise in only one thing – we, in turn, have to perform the skills of a medical doctor, a teacher, an agronomist, a lawyer etc. to secure our people” (Mariano 1997).

I do not wish to go into too much detail here concerning the *maloca*-owners and their assistants, as this is described in chapter five (see also Kronik and Kroeyer 2001). However, brief mention of one special feature of the studies undertaken by *maloca* owners, riddle-cracking, is justified. In the following quote, one of Araracuara’s traditional advisors explains the objectives of riddle cracking. Here, he epitomises the essence of the indigenous learning system, as I see it. This is probably the most important statement presented in this dissertation.

*This is the importance of the riddles (...) But only the Dance of the Fruits of the Earth have riddles (...) because this dance is like [an image of] contemporary life of mankind. If we can crack the riddles of diseases and thus learn about the diseases of plants and fruits etc., we may crack and learn about problems we have, the diseases we suffer, and thereby overcome them and cure and defend ourselves. Therefore, we undertake this practice and capacity building of riddle cracking. He who has such practice, knowledge and experience with riddle-cracking can also discover and heal his problems in life.*  
(Aurelio 1997: transcribed from video interview, Kronik 1997).

Aurelio Suárez explains how and why people, both *maloca* owners and assistants, are being prepared during the course of a cultural education. The point is, according to Aurelio, that certainly the factual knowledge is of importance. However, much more important is to strengthen the individual and collective ability to “crack the riddles of life”. According to Aurelio, it is this problem-oriented capacity building that enables people to tackle whatever problem may confront them in their everyday lives.

*The maloca owners are not just anybody*

To initiate a study of this sort there are certain requirements. The position as owners of a dance career, and the study and exercising of the ‘word of the dance’<sup>41</sup> should ideally, according to tradition, be inherited from father by the eldest son. If the parents of the husband of a couple who wishes or is asked to take

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<sup>41</sup> The term ‘word’ refers to ritualised discourses and specialised knowledge.

on the study, are not *maloca* owners and masters of a dance, then the host couple may follow the wife's parents. This gives her a more prominent status. There are exceptions, particularly when it comes to the Dance of the Fruits of the Earth. The reason for this is related to the importance to the community of the function the 'owners' of this dance perform in providing protection of health and abundance. It was explained to me that anyone who has the capacity may initiate the study if the community accepts it.

A graduated master of a *maloca* can take on another study if he carries the *words* of two festivals, i.e. if both mother and father were raised in *malocas* with different specialisations. In certain cases, a kin group, a clan, or a community may decide that a couple can or should take on a certain study for the benefit of all.

In the Muinane community of Chukik+ there are currently four full-sized and working *malocas* with graduated owners, and in the larger multi-ethnic community of Araracuara, there is only one culturally functioning *maloca*.<sup>42</sup>

*Belisario's maloca:*

*Institution building as defence of territory and culture, access to and control over natural resources*

The *maloca* of Araracuara varies substantially from the others I have worked with. It is not primarily a kinship-based *maloca*, but a community *maloca*; the ancestral knowledge formally practised is drawn primarily from the mother's family, not the father's. The mother, Juana Suarez, is Muinane unlike her Uitoto husband, Bartolomé Castro. So their son, Belisario, is guided by and tested according to the knowledge developed in a different ethnic group than his own, given that ethnicity follows a patrilinear line. Finally, it is the *maloca* of a student, not a master. It measures 16 by 8 meters, with 8 meters between the two 8-meter high pillars. The fact that it has two and not four pillars indicates that the study is underway and that the father of the student did not undertake a career.<sup>43</sup>

This particular *maloca* is the result of a long process of community building in Araracuara, which was fomented by conflicts with Colombian institutions over land and natural resources. To understand this, a brief historical account is necessary to provide the setting for these conflicts and the formation of new indigenous actors.

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<sup>42</sup> By a "working" or "culturally functioning" *maloca*, I refer to *malocas* celebrating a dance career and undertaking the corresponding daily and seasonal activities.

<sup>43</sup> There are concrete plans to burn down the *maloca* after the fourth official dance and to build a new one with four pillars during the year 2001.

During the last 100 years the indigenous populations of the area have witnessed much social change. Exploitation of rubber by British-Peruvian companies, like the notorious Casa Arana, imposed a regime of terror with forced labour and debt bondage (1890-1930s). The church and later the state arrived during these same years, forcing children to enter their boarding schools and banning the use of indigenous language among the children. Although a few managed to escape the various interventions, most did not. Diseases and violence culminated during the Colombo-Peruvian War (1932) and, in the case of some populations, led to complete genocide, while others were diminished by 50-95 percent (Gómez et al. 1995). After the violent clashes during the era of the rubber exploitation and the war, a Colombian Penal Colony was established in Araracuara, with camps up- and downstream. The 6000 guards and the up to 15,000 prisoners exerted a strong influence upon the population and landscape, introducing cattle, rice, plantain, and maize production. Some indigenous people integrated more than others. Some women married guards. Prostitution flourished. Some men worked for wages, and most people changed certain aspects of their lifestyle, consumption patterns, and cultural identity. When the Penal Colony moved out in the 1960s, the buildings were taken over in turn by different ministries. In 1972, the Corporación Colombiana para la Amazonía, Araracuara, (COA) was established and the installations were handed over to it. The research centre, which mainly worked on improving agricultural commodity production, had its rise during the 1980s, when it attracted many researchers and students who were funded in part by a joint venture with the Dutch research foundation, Tropenbos. At the beginning of the 1990s, the contract of co-operation between Tropenbos and COA was not renewed, which in effect left COA without financial resources. The activities in Araracuara were cut from up to 100 researchers, students, and administrators during the 1980s to one administrator and a few students during the 1990s. COA's strategy for survival was to link up with the national reformulation of the whole environment debate in the wake of the new constitution of 1991 and the creation of the Ministry of Environment shortly thereafter. COA was reestablished under the name of SINCHI.

When the research centre was set up in the beginning of the 1970s, researchers and administrators started looking for local personnel, such as research assistants, guides, and labourers. The first to make contact was Bartolomé Castro and Oscar Román. In the beginning, they had their families and residence 10-20 hours travelling time upstream, where Chukik+ is found today, but after a while, the COA people asked them to move their families and settle close to the centre. They were not allowed, however, to initiate any form of indigenous agroforestry (*chagras*), as the whole area was designated for scientific purposes. This goes against Amerindian livelihood strategies, as the *chagras* and the extensive subsequent phases with fruit plantations are the only possible kind of 'savings account' or 'pension scheme' available. So both families secretly made small clearings and burned them when the research administrators were out travelling. As the centre grew, more families arrived.

During this same period, the only non-indigenous village in the area, Puerto Santander, situated across the Caquetá River from Araracuara, grew with the partly market-based economy of the prison and the research centre. Some of the guards and prisoners and a family dating back to the rubber exploiters settled there with migrating indigenous people. Because of a geological formation, there is little or very poor agricultural land close to Puerto Santander, so the population lives mainly from fishing in the rapid waters of the Chorro of Araracura and from buying and selling to the local and regional market. Some of the recent indigenous settlers in Araracuara are seasonally dependent upon the merchants of Puerto Santander, especially after they set up cold stores and started exporting fish by way of the airstrip in Araracuara to markets in Bogota. The fishing boomed during the 1980s parallel with the research-based income boom. However, both sources of income dried out simultaneously, and this created a rather desperate situation in Araracuara, leading to increasing pressure on natural resources. This in turn stressed a need for communal management.

The people of Araracuara are a mixture of seven ethnicities, and compared to other communities, they are in many ways a heterogeneous group. Since they immigrated here from many different clans, ethno-linguistic groups and communities, they have very different social, economic, and ethnic ties and alliances. Some are engaged in severe conflicts with others. They fight over issues of land rights originating partly in the fact that they belong to different clans. Some conflicts date back to the violent events at the beginning of the 20<sup>th</sup> century. The lack of money from institutions probably contributes to certain increasing problems with theft of personal objects and crops. During the beginning and middle of the 1990s, a major group was consolidating itself comprising approximately 50 out of 65 families. They shared the wish to secure new sources of income, establish social order, regain what they saw to be land stolen by the “Colombian” society, and control the use and conservation of natural resources. Although the group still was very heterogeneous, they managed to build a common ground and to direct their frustration outwards. The group of families appointed a traditional council and a community council (*cabildo*), with Belisario, the son of Bartolomé, as governor. From then on, they began calling themselves “the multi-ethnic indigenous community of Araracuara”. They started to hold frequent meetings in Bartolomé’s *mambeadero*, which was not seated in a *maloca* at that time. From there, they studied national legislation concerning land titling and access to government funds for community level development plans. They initiated a process to establish a territory and began a formal struggle to take over the land and buildings tied to the recently dissolved institution of COA. Later, they had three persons elected to the municipality council of Solano in the first municipal election ever held in this part of the country.<sup>44</sup>

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<sup>44</sup> In the vast area corresponding to the municipality of Solano, the biggest in Colombia, the

During this process, they found the meeting place was too small and decided to enlarge it. While preparing the work plans, Aurelio said that he had “marked” two pillars. This meant that he knew where to find two trees of the right kind and size. Aurelio remembers that as they were carrying them to the place (and they may each weigh several tons), people from upstream passed by and asked, “*What are you doing? Those are not pillars for a simple hut, they are pillars for a maloca*” (Aurelio Suarez 1997). This was taken as criticism for not having analysed the subject well. Therefore, a handful of local and upstream elders were asked to look into the subject and propose a viable path. The group included close allies but also an elder from a group in Araracuara with whom they had many conflicts. It was agreed that if Bartolomé would authorise his oldest son, Belisario, to become an authority, thus exceeding his own position in a strictly cultural sense, then he and his wife could be accepted to study and carry the word of a dance. Since the father, Bartolomé, was not a son of a *maloca* owner, he could not be the process advisor. Therefore, they followed the line of the mother. Her father was master of the Dance of the Fruits of the Earth, so this was the career to be followed. Hereby, both her and her daughter-in-law’s social positions were strengthened in the community. And although Belisario’s uncle, Aurelio, who is the traditional advisor to the community of Araracuara, would be perfectly able to advise Belisario,<sup>45</sup> he does not have a proper *maloca*, because he is not the oldest son. His elder brother, Mariano, who lives in Chukik+, has a *maloca* and completed the career of his father. So he was appointed process advisor.

In this way, two institutions were seated in Araracuara within a very short time. One directed at and drawing upon the Colombian society’s norms, institutions and resources, and one directed towards and drawing upon the indigenous culture. In the beginning, the meetings were held jointly, during the night-time *mambeadero*. But soon after, a wish arose from many parties for a temporal separation of the two ‘negotiating’ fora. The elders and traditionalists thought it inappropriate to keep them together, as there was never sufficient time for the cultural learning processes and ceremonial events referred to above and which will be described in further detail below. They felt that the political discussions concerning land rights, with their mix of gossip and legal texts, took up all the time and interest of the young.

Two other groups were also in favour of splitting the two fora: the women, who were not allowed in the circle of the *mambeadero* and were therefore cut off from direct influence on issues of schools, public investments, and political strategies; and the not so culturally minded people who are not accustomed to go to the

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electorate does not exceed 2500 persons. The reason why Belisario’s group got three out of seven seats is due to the fact that the Guerrilla blocked the elections in and around the town of Solano. Solano lies some 500 km upstream from Araracuara.

<sup>45</sup> Along with other experienced elders from the community.



*mambeadero* and who depend upon income generating activities rather than indigenous agriculture. They are very interested in opening up political space to try to attract new sources of income and are not so interested in the *mambeadero* talk, as it often relates to the indigenous production system.

It was therefore agreed to separate, in relation to time, the outward political, legal, and economic issues dealt with by the *cabildo* from the issues of health, gardening, morality etc. dealt with in the *mambeadero*. The community meetings are now held during the daytime and the cultural meetings continue to be held during the night.

### *The malocas of Chukik+*

In Chukik+, there are three clans which in fact include four extended families. They have currently four full-sized, four-pillared *malocas* along the shores of the Caquetá River. But also here, there is a tendency toward consolidation of the cultural institutions. During just the last two years, two *malocas*, one full-sized and one small, two-pillared *maloquita*, have been abandoned, making room for two new ones. The two *malocas* were abandoned by the two oldest men in the community. However, they did not hand over the right to start a ceremonial career to their sons as prescribed, but to younger but very experienced brothers.

Chukik+ as a community is of recent date. It is an offspring of the Monochoa indigenous territory and came into being due to kinship and ethnic-related conflicts. The people (that is the men) of Chukik+ are all Muinane, while the women are all Uitoto. The rest of Monochoa comprises Uitoto led families. The people of Chukik+ all have relatives who migrated downstream to Araracuara.

Mariano, who as I have mentioned is Belisario's advisor in his career, lives in his *maloca* with his wife Dolores and the families of their two sons, José Daniel and Francisco Javier. Mariano is a graduate of the career of the Dance of the Fruits and now celebrates the Dance of Turtles, which is concerned with the complex dimensions and aspects of the management of and relations to fauna. Mariano is the head of the Clan of the Jungle Drums. Ideally, the families of Aurelio and another brother, Ángel, should also each occupy their side of the *maloca*. However, certain conflicts have kept them apart.

Upstream from Mariano's family lives the old *Casique*, Honorio Mukutuy, and his wife, Francisca Fenake, with their two unmarried sons, Libardo and Rodolfo. Honorio and Francisca have a comparably very small *maloquita*, although he is a man who is highly respected and feared for his knowledge and ability to control the elements of nature. The reason he is not positioned in a large four-pillared *maloca*, I was told by his nephew, is lack of *ambil*. I interpret this as a lack of interest in or ability to attract a strong network of allies who will perform the hard work of living with and under the dominance of a powerful authority. Just as I

finished fieldwork, he handed over his powers to his younger brother, Raphael (60 years old), judging his sons not to be sufficiently prepared to take over the position. The fact that the oldest son (40 years old) has no wife prevents him from taking the position, as he would be unable to maintain a *chagra* and thus a *maloca* and a ritual career.

Just downstream from Mariano lives Raphael Mukutuy. He just recently built a large *maloca* to celebrate his newly established position as *Casique*. When I worked in the region, his large extended family lived in a large palm house that did not have the official status of *maloca*. Raphael is now head of the Clan of Worms. His oldest son, Narciso, is the teacher of culture in their newly established school, and his second son, Silvio, was the community governor, when I left in 1998. According to written correspondence, Raphael has initiated a career in his newly built *maloca*.

Much further downstream, halfway to Araracuara, live the families of the Clan of Pineapple. On the right side of the Caquetá River, in the Department of Amazonas, live the families of three brothers, Jesús (Chucho) and Celina, Calixto and Blanca Estela, and Jorge and Leopoldina, and their two sons, Eliseo and Hernán.

The three brothers maintained a large 12 by 12 meter *maloca* headed by the elder brother Chucho. He was to complete his second career just after I left and decided to make room for the middle brother, Jorge, to take up the Dance of the Fruits. Apparently, they abandoned the old *maloca* – probably burned it down, to build Jorge's *maloca* around the same pillars.<sup>46</sup>

On the other side of the river, in the Department of Caquetá, lives their cousin, Arturo Rodríguez, with his wife, Maria Albertina, in their 10 by 10 meter *maloca*, with the families of their two sons and two daughters. Arturo managed to complete one career before the rain came through the roof. Only recently, he started a new career, after having renewed his roof.

### **Importance of livelihood strategies for the distribution of knowledge on plant diversity**

#### *Locally defined livelihood strategies*

The exercise I developed to elicit a classification and description of local livelihood strategies is a central source of information for the following analysis. From the descriptions given by six persons of the different ways of living, I developed four categories. To check that the six persons agreed about which persons belonged to each category, I ran a few statistical tests (see Annex 1). The four

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<sup>46</sup> Only the old braided roof will burn. The pillars, made of hardwood, will remain intact.

categories are used in the following to show how knowledge related to biodiversity, and particularly knowledge on palms, is distributed according to livelihood strategies. Certain characteristics of living in the region turn out to be particularly indicative of the differences between local ways of living. These characteristics support my thesis about the inherent link between living and knowing. Naturally, it is always risky to 'box' individuals according to certain criteria. People are whole individuals who act and think in often seemingly contrasting ways. However, as the criteria are defined locally and the information is triangulated by both using statistical analysis and through my good overall knowledge of people's aspirations and livelihoods, I feel comfortable with the validity of the findings.

The apparent link between living and knowing coincides with the conclusions from chapters two and four. This section examines how so-called ethno-botanical knowledge, including local botanical, taxonomic and agronomic knowledge, is linked and distributed among different ways of living. Central to this analysis is to establish which elements or dimensions of these strategies are salient. Relating these and their social dynamics separately to the production of knowledge on plant diversity should enable us to qualify the analysis of the impact of social change upon knowledge production.

From the card sorting livelihood classification exercise developed in chapter three, six sets of descriptions of livelihood strategies were collected. The four categories, or strategies, which emerged, are summarised below. A more detailed presentation is found in Annex 2.

I wish to emphasise that there is not necessarily a normative order between these categories. The order varies substantially depending upon the eye of the beholder. What is interesting is that the six informants agreed to a large extent as to which elements described each of the strategies, and although they grouped the persons into different numbers of strategies (from 5-9), it was not difficult to regroup these into four strategies. The validity of doing so is only confirmed by the fact that each of the six informants classifies the same people by the same criteria. This was additionally tested successfully by a pair-wise quantitative correlation (see Annex 1).

### *Typology of people according to how they "act, think, feel, and relate"*

#### *Leaders and organisers*

In the descriptions of the various livelihood categories, the quality of leadership emerged in each of the classifications. The informants would refer to one group of classified persons (by placing slips of paper with names written on them in a pile) thus: "These are the leaders"; "these are the organisers"; "they struggle for our rights"; or "they have visions for the good of us all".

As they are the ones chosen to head the *Cabildo*, the village council, they are the people who have the most contact with Colombian society at the political level. They go to the cities for meetings more frequently than others, or to knock on the doors of the Ministry of Health or Ministry of Education etc. and the various NGOs.

People described in this way are all men who hold important positions, such as governors of the village council or owners of *malocas*. Therefore, they also play important roles locally in cultural institutions like the dances and in organising communal work sessions, the so-called *mingas*, both at community and clan level. They have all sown *chagras* from which they live. They are not paid for their communal work.

They are described as thinking in terms of development and progress, and as people with a good capacity to solve problems. This capacity is fostered by the ritual and cultural dialogue during the nightly *mambeadero* talks, be it in open discussion or during council with, for instance, the people often referred to as advisors.

At the personal level, these people are said to possess qualities like stability of ideas and social life, as well as trustworthiness, hard work, and a good ability to receive advice; but this is not mastered by all. One informant, Lucho, broke up the group into “leaders” and “bosses”, the difference being that leaders are patient and process-oriented and say, “*Let’s do this...*”, while the bosses are impatient and highly focused on visible, material results; they say, “*Do this...*”.

#### Advisors

Common to people classified in this livelihood strategy is their sense of sociality, their involvement in cultural fora, and their collective outlook. The name “*orientadores*” or advisors was explicitly mentioned by several of the informants and implied by the others also. This is a common denominator of this group of people and gives them a certain status in society; this is not, however, reflected in material well-being.

The advisors seldom engage in direct contact with “modern institutions”, apart from when they are called upon by researchers or asked by community leaders to guide researchers. However, the indigenous schoolteacher said that a process is now underway in Araracuara to reconcile or bridge cultural fora and “national fora” (such as local government). This is in part due to the process of strengthening the community’s political platform in state regulation and implementation of natural resource action plans, regional plans etc., including rights and access to territory and state funds.

“*They are the cultural basis of the community, the maloca, and the Cabildo*”, as Miriam said, explaining that as they are people with good cultural insights who

often frequent the *maloca* or live in the *maloca*, they are very important for the health and protection of the community.<sup>47</sup> Both men and women in this group are respected for the advice they provide. The men are often asked for their opinion in cultural institutions, such as the *mambeadero*, the dances, and in connection with larger communal works. They are heard in issues of health and education and council the local government, sometimes drawing upon traditional narratives. The men classified as advisors meet and must reach agreement by consensus during periods of ritual dances, that is, during the final evaluation or before the initiation of a ritual career.

The women of this group are known to be hard working. They are known among women as the most knowledgeable concerning agricultural issues and food processing and are frequent suppliers of seeds and advice on crop management etc. Most *maloca* women fall into this category, especially those who are very active in the preparations for ritual dances, when they participate in both organisational positions and ritual performances.

Some of these people are referred to as “traditionalists”, as people who take cultural notions etc. literally and who have high expectations in regard to tradition for the benefit of the community. They become disillusioned when things do not live up to their expectations. Although they all give good and well-reflected advice, some are blamed for not being able to receive advice or criticism, “*although this is fundamental in our culture. A child may correct a Casique*” (Lucho Sueroke, interview 1997).

They are often in conflict with the “bosses”, as the “advisors” and especially the “traditionalists” are not interested in material results or material well-being, whereas the primary goal of the bosses is to see their ideas materialised. One informant, the Chukik+ schoolteacher, said that this group of people exert much intellectual effort in fitting modern ideas with tradition.

#### Individualists drawing on cultural practices

A third group of people was classified by criteria such as passivity, and unwillingness to participate in cultural institutions such as the *mambeadero* and the *minga*. Their approach is referred to as individualistic, in the sense that they work alone and rarely socialise. Most have *chagras* and make an effort to combine cash crops with subsistence crops.

Common to this group and the following group is their interest in money-based economy. However, their strategy differs from the following group, in that they principally try to raise money through the incorporation of cash crops into the

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<sup>47</sup> Implicit in the term “protection” lies a spiritual and a material aspect.

indigenous gardening system and by making crafts for the market rather than seeking day labour wages.

They are referred to as people with a strong gardening identity, to the extent that they rarely speak of anything but their *chagras*, their orchards, and their crafts.

#### Non-cultural individualists

From the descriptions, a very distinct livelihood strategy emerges that differs from the others, especially the first two strategies. It is followed by people who are said to “*simply live to live*”. They “*have no aspirations or visions, and their main concern in life is how to obtain money and food. This has become a salient feature of their whole way of thinking, relating, and acting*”. This is indicated by two independent descriptions (Mirian Perdomo and Lizardo Lopez 1998).

These people never participate in unpaid communal work; they very rarely visit the *mambadero*; they are not able to participate actively in the preparations for the dances. They rarely have *chagras* and none have orchards. Their livelihoods depend on market-based extractive activities, such as fishing, cutting timber, catching ornamental fish, day labouring or short-term contracts with the state and other modern institutions. “*They think like fishermen - they are exploiters, who only think of themselves*” (Miriam Perdomo 1997).

According to several informants, this group is described as almost “turning white”. This is a reference to the white settlers whose productive efforts bring no true development, neither for themselves nor for the community. Around 25 per cent of the indigenous population was classified as belonging to this category.

#### *Discussion of strategies*

People employing the livelihood strategy referred to as *leaders and organisers* are classified according to their positions and actions of leadership. They are owners of a *maloca*, administrative leaders, healers etc. Part of this characterisation involves their ability to maintain a constructive dialogue with both non-indigenous and indigenous institutions. The ability to achieve results through such relations for the benefit of the kin-group or community emerges as a central notion.

Another livelihood category is labelled as *advisors*. This group provides guidance based upon local institutions and practices, such as the *maloca*, the *minga* (i.e. communal work), the dances etc. to everyone in general and in particular to people classified as *non-cultural individualists*, those who “only live to live”.

The people classified as employing the livelihood strategy of *leaders and organisers* are referred to as being self-sufficient through their *chagras* and fruit plantations. This group consists of men only. This may reflect two factors: first, the

emphasis on leadership in a male-dominated culture, and second, the fact that only one out of the six informants was a woman. Speaking against this possible gender bias is the fact that the woman placed only men in the category of *leaders and organisers*. What is particularly interesting about this group is that it is evident that people classify both modern and traditional leadership as belonging to the same strategy. There seems to be tendency for positions of traditional leadership to be held by mature and elder men, while positions of modern leadership, within the *cabildo*, tend to be held by younger family fathers. While the long process of becoming a traditional leader explains the first tendency, I find two explanations for the youth of the second type of leaders. One is their greater mobility. As a governor of *cabildo*, you have to travel to the larger cities of Colombia and this entails a lot of hardship. The second reason is the young people's better skills in communicating with state officials, NGOs etc. because of their years at school. Most of the *maloca* owners have had modern leadership positions in their youth, and some of the modern leaders are moving towards traditional leadership. I discuss this further in chapter five.

People employing the *advisor* strategy are often classified in relation to the livelihood strategy of *leaders and organisers*. The main difference is that the advisors seldom take leadership positions. This is explained as lack of personal ability or interest. They are referred to as hard working and social in their approach, participating in communal work and in cultural and other fora. The so-called *traditionalists* are mainly to be found among people employing the first two strategies. This is a rather small but influential group, who provide guidance, "who analyse the why's" (Lucho Sueroke 1997), and who disagree fundamentally with people classified as employing the *cultural individualist* strategy for their passive and individualistic approach. The advisors expect much from tradition; they do not engage in non-indigenous institutions; and they oppose materialism. According to one observer, "their main flaw is their lack of ability to accept and follow advice from others" (Lucho Sueroke 1997).

People employing the *cultural individualist* strategy act, think, feel, and relate in ways similar to the advisors, apart from the fact that they work alone. In other words, they are not social in their livelihood approach. They live for their domestic situation, their *chagras* and their handicrafts. Some classify them as passive, some as peaceful. They do not experience many personal problems, nor do they cause other people trouble. They work very much toward acquiring a monetary income to fill their short-term and long-term needs, and this has become an important feature of their way of socialising.

People following the *non-cultural individualist* strategy generally face a difficult life and are dependent on a monetary income. They often lack food and are obliged to ask for loans, or more often, they harvest from other people's *chagras* and fruit plantations. They do not participate in communal work or gatherings and are described as "almost living like the whites". This is a phrase often used to

describe indigenous people who arrive from the surrounding communities and do not follow a 'cultural' dimension in their way of relating with other people, even less in their ways of production and approach to the market etc. For various reasons, they rarely have their own fruit plantations, and since these function as a kind of savings account, they have to rely on other sources to secure their present and future livelihoods. All of the women who do not have well functioning *chagras*<sup>48</sup> are classified within this category.

The most salient tendencies seem to be that the descriptions of the leaders and advisors strategies involve a more collective approach that work through local institutions. They are part of or can draw upon a strong network, both as sources of knowledge and labour, and on the basis of the interview series I may add that they have access to highly developed mechanisms for distribution and conservation of seeds. In contrast, the *cultural individualist* strategy and the *non-cultural individualist* strategy tend towards individualism, some due to their own will and others out of need. From the descriptions in Annex 2 and the discussions above, we learn that there seems to be a relationship between the individualistic approach and certain types of relations with modernity. This also emerges very strongly as a tendency in the interviews. It can to some extent be explained by personal desires, but more importantly as compensation for a lack of engagement in cultural networks and institutions. In these strategies, people cannot draw upon other people's labour, skills, food resources etc. on the basis of relations of reciprocity or what some would define as debt claims. Therefore, they have to buy such services with labour or money. As the only access to money goes through the non-indigenous institutions and actors, they (have to) pursue such relations. The main difference between the *cultural individualist* and the *non-culturalist* strategies is the relationship to production. Whereas people who were described as following the *cultural individualist* strategy focus strongly on the *chagra* and fruit plantation system,<sup>49</sup> people employing the *non-cultural individualist* strategy are engaged in more day-to-day or seasonal activities, such as fishing or day labour.

These tendencies also emerge from other aspects of fieldwork. One example is a study in which we focused on Muinane and Uitoto classification systems concerning palms. During a number of one-to-one forest walks and a series of meetings, it became clear which people were strong on botanical knowledge, in terms of both distinguishing plants and describing their differences. It also became clear who had a developed theoretical knowledge about how to order the plants, and who had the knowledge and authority to set the criteria for classification. These experts all fall into the *leader* and advisor strategies. Specific to them is also their age and their active participation in cultural institutions, often as leaders. The elderly female experts turned out to be as knowledgeable about both wild and

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<sup>48</sup> That is, diversified in terms of cultivating fruits and vegetables, and not only food staples.

<sup>49</sup> As they develop their "cultural savings account", they provide for future food security.



domesticated palms, while mature knowledgeable women knew more at the level of varieties of domesticated and other cultivated palms and palms vital as sources of food and fibre. These represent more than half of the palm varieties known to the people in the region and are ranked highest in terms of both local economy and cultural salience (Kronik et al. 1999).

## **Knowledge on plant diversity and place: *Riar+* - an agroforestry system**

Araracuara and Chukik+ in the south-eastern Colombian Amazon are no exceptions with respect to the extent, complexity, and economic importance of both plant diversity and associated bodies of knowledge, as referred to at the end of chapter one. In the following, I explore how knowledge on plant diversity is distributed in the region. This analysis is used to confirm the thesis that the activities engaged or not engaged in by individual persons have a direct influence upon which knowledge domains they know about and how detailed is their ready knowledge of some of these. To do this, I focus on people's most important activities in the cultivated areas and in the high forest. I demonstrate that neither the activities nor the knowledge of plant diversity are equally distributed. A partial explanation, I argue, is found in the way production and reproduction is organised, as well as in the specific biophysical conditions within the area.

### ***The chagra***

If you enter a recently established *chagra* in the Araracuara region expecting a modern type of field, the first impression is likely to be that it seems messy, without immediately visible signs of structuring principles. Large unburned tree trunks lie scattered around, and the often-hilly terrain and bushy vegetation makes it difficult for the inexperienced observer to navigate. This impression, however, is far from the picture you get after studying more closely the highly detailed agro-ecological guidelines, notions, and procedures developed locally, which people use to manage the resources at hand. Making and managing a *chagra* requires, among other things, knowledge of climate, soils, crops, and pests, as well as organisational skills and access to labour.

In and around Araracuara, as in many indigenous communities all over the Amazon (Balée 1989, Denevan and Padoch 1988), the most important set of activities for the sustenance of local livelihood is the swidden agroforestral "*chagra-orchard*" production (see also Vélez and Vélez 1999; Garzon and

Makuritofe 1990, Griffiths 1998<sup>50</sup>). The *chagra* not only secures local livelihoods but also adds to a sense of indigenous identity. It places people in a desirable position in contrast to those who “*simply wish to live like the white people, who depend upon money; and also in contrast to nomadic people and restless wanderers who live like animals, and do not have the power or will to settle and dominate or humanise the forest*” (interview with Arturo Rodriguez 1997).

The system consists of one or several *chagras*/plots which are cleared annually. After two or three years of intensive production, they develop into a number of orchards, i.e. post-*chagra* successional stages that range in duration from 3- 40 years. The agroforestry system is a highly diverse system of short-, medium- and long-term production cycles. In a comprehensive study of the agricultural production of a large number of Uitoto, Muinane, and Nonuya *chagras* and orchards in the Araracuara region, two Colombian agronomists, Vélez and Vélez, found that it includes more than 75 species and 300 varieties within 36 taxonomical families. People distinguish between several types of fields. The main distinguishing principles are:

- the types of soils;
- whether land is seasonally flooded (*varzea*) and therefore only suited for high-value but very short-term crops (up to 8 months), such as rice, plantains, and maize; or not seasonally flooded (*terra firme*) and therefore suited for longer-term crops;
- whether it is planned to be or has become an orchard;
- and whether the type of vegetation prior to felling was high forest or fallow.

Concerning the more specific knowledge domains, such as knowledge of how to differentiate between types of soils, and which useful conclusions to draw from it, several studies conclude that indigenous people of the region classify and employ soils on a very detailed level. Vélez and Vélez (1992) and Griffiths (1998) refer to around 20 types of soils. My study with the Muinane of Chukik+ revealed 12 types, named and classified after criteria of soil texture, humidity, colour, and a number of agronomic references. Especially the informants who are experienced with the *chagra*/orchard system employed a large number of these categories in explaining which plants grow in which types of soils, or which types of soils serve for which type of *chagra* etc.

The short-term cycle forest field, cleared from high mature *terra firme* forest is referred to as the “proper *chagra*”, or *nátik+pa+* in Uitoto. Another prominent type of *chagra* is the one cleared from secondary vegetation, known as

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<sup>50</sup> Griffiths confirms the primacy of the *chagra*/orchard system and domesticated crops in Uitoto cultural models of livelihood and social reproduction through i.a. an analysis of Uitoto economy, cosmogony, and cosmology.

*moggopa+*. *Nátik+pa+* has a median size of half a hectare, although this varies with the labour resources available. It is the principal supplier of bitter cassava, which is the main staple of the local diet. *Nátik+pa+* demands more labour than *moggopa+* to establish, but less for weeding. Crops develop slower in *natik+pa+* but ensure longer term food security, since the bitter cassava may remain for three years in the *nátik+pa+*, while it may rot in the fallow *chagra* after only one to two years, and also because it protects and sustains fruit trees better in competition with weeds. While *moggopa+* is usually less diverse, *nátik+pa+* includes food staples of roots and tubers, such as 56 varieties of bitter and 20 varieties of sweet cassava; grains, like peas and four varieties of peanuts; spices, including the 26 varieties of chilli peppers. In addition, 35 varieties of the short-term and very sweet Amazonian pineapple were identified.

People's land use strategies include both *nátik+pa+* and the usually smaller fallow *chagras*. The general rule is that people clear one *nátik+pa+* per household during the dry season (December-March), and one or several *moggopa+* (fallow *chagras*) biannually (mainly in August) to increase the food supply of short-term crops like sweet cassava and to care for seeds and cassava sticks of crops consumed outside their sowing season.

The orchards, commonly referred to as *frutales* (Spanish) or *riare* (Uitoto), take over from the intensive *chagra* production after approximately three years. People normally sow their seeds for fruit production in the areas where the *chagra* burned best three years earlier. So it is not necessarily the entire *chagra* that is made into orchard. The remaining areas are often cleared and burned during August or February (after a short fallow period of six to seven years) for the purpose of increasing immediate and short-term food supplies and to replant and care for the seeds of important crops and varieties. By the time *yuca* (cassava, *manioc esculenta*) and other short-term crops are finished, some of these fruit trees start producing. Among more than 25 fruit tree species with medium-term production (3-10 years), Vélez and Vélez found 13 varieties of peach palm, 8 varieties of maraca, avocado, lime etc. plus ritual plants like tobacco and coca, and medicinal herbs like basil etc. The long-term production cycle (11-40 years), which entails less weeding than the short-term, is rich in ritual, medicinal, and toxic products like *ortiga*, *achiote*, *yage*, and the *icticidal barbasco*, as well as nine fruit species, including *canangucha* and *milpesillo* palms and 20 varieties of *guacure* (Vélez and Vélez 1992).

## The social organisation of production and reproduction

In my survey and mapping of land use strategies, I found that there is a clear distinction between indigenous and non-indigenous individuals and households.<sup>51</sup> As illustrated in table 4.1, only 40 percent of the non-indigenous households works the land compared to 96 percent of the indigenous households.

**Table 4.1: Occupation of ONE person in hh \* Household ethnicity**

	Indigenous	Non-indigenous	Mixed	Total
n=	46	15	16	N=77
Farmer	96	40	75	81
Fisherman	13	53	56	30
Student	17	7	6	13
Shopkeeper	2	20	13	8
Housewife	9	40	25	18
Employed	17	27	6	17
Migrated	9	0	19	9
	100	100	100	100

None of the non-indigenous farmers have orchards, whereas all of the indigenous do or else the younger and a few recently arrived have prepared their forest *chagras* as *natik+pa+*, sowing seeds for long-term fruit-tree production together with the short-term and medium-term seeds. Three-quarters of the mixed couples (indigenous and non-indigenous) work the land; however, they only cultivate with orchards as a part of their strategy in the cases where the woman is indigenous. Although almost all of the indigenous households cultivate the land, the extent varies. The main differentiating principles seem to be:

- Occupational preferences.
- Age and years spent in the community after settling down as a household.

<sup>51</sup> The categories of “indigenous” and “non-indigenous”, and the categories listed under the heading of occupation reflect people’s own self-identification. Naturally, some categories, like “fisherman” and “farmer” may overlap, i.e. the same person may do both; however, the category in which they are classified corresponds to the one they indicated for themselves.

- Access to land and seeds
- Last but not least, access to labour.

In the following, I examine each of these differentiating principles.

#### *Other occupational preferences*

Unlike Chukik+, where at least one adult from each household is dedicated to the *chagra*/orchard system, almost one-quarter of the households (23 percent) in Araracuara do not use this system and thus live predominantly from non-agricultural activities<sup>52</sup> (see table 4.2).

**Table 4.2: Occupation of ONE person in hh \* Place of head of this person's household**

	Chukik+	Araracuara	Bogota	Total
n=	12	64	1	N=134
Farmer	100	77	100	81
Fisherman	17	31	100	30
Student	33	8	100	13
Shopkeeper	0	9	0	8
Housewife	8	20	0	18
Employed	8	19	0	17
Migrated	50	2	0	9

The census survey I carried out in 1996/97 in Araracuara and Chukik+ shows that one-third of the adult individuals in Araracuara are primarily occupied in non-agricultural activities such as fishing (12 percent) and employment by the state or other Colombian institutions (6 percent), leaving 65 percent of the adult individuals occupied primarily with agroforestry (table 4.3).

<sup>52</sup> This figure includes both indigenous, non-indigenous, *mestizo* and mixed households. No one lives as agricultural workers.

	<b>Chukik+</b>	<b>Araracuara</b>	<b>Affiliated members living in Bogotá</b>	<b>Affiliated members living in Pto Santander</b>	<b>Affiliated members living in other indigenous settlements</b>	<b>Total</b>
	n= 40	178	18	3	7	N= 246
Farmer	80	65	11	33	43	62
Fisherman	8	12	6	0	0	10
Student	10	5	22	0	14	7
Shopkeeper	0	5	0	0	0	3
Housewife	0	7	0	33	43	7
Employed	3	7	0	0	0	5
Migrated	0	0	61	33	29	5
	100	100	100	100	0	100

In Chukik+, 80 percent of the individuals work the land, while only 20 percent of the adults are primarily occupied with non-agricultural activity, including 10 percent who study in distant locations. One explanation is the abrupt decrease in wage labour since the research institutions have scaled down drastically, another the abandoning of the US and Colombian army base in Araracuara. More and more of the young indigenous people have turned to their agroforestry system during the last decade or so. This may explain why there are more young farmers (65 percent of the farmers are 18-34 years old) than mature farmers (55 percent are 35-49 years old) There also seems to be a strengthened tendency for young people to return to the region from the cities they had migrated to, or where they stayed for one or several years of study (see table 4.4). There has also been a serious decline in fishing. Three months of the year a large number of people are engaged in harpooning large *bagre* and other fish in the rapids of the Caquetá River, which they sell to the cold stores in Araracuara and Puerto Santander. Probably because of over-fishing, they only fill approximately one cargo flight every 4-6 weeks, whereas people say that during the 1980s, they could often fill a flight per week. Still, a rather significant number of men engage in fishing. As shown in table 4.8, 18 percent of all men define their main occupation as fisher-

man compared to less than one percent of the women. When it comes to explaining occupational preferences, it adds slightly to the picture that more men study (10 percent) than women (4 percent), and that employment by modern institutions is spread out across gender, age, and ethnicity. Not surprisingly, however, the non-indigenous settlers engage comparatively more in this activity.

**Table 4.4: Occupation (18yrs+) \* Lifecycle**

	18-34 years	35-49 years	50-99 years	Total
n=	135	71	40	N=246
Farmer	64	55	68	63
Fisherman	8	11	15	10
Student	13	1	0	7
Shopkeeper	1	9	3	3
Housewife	4	11	5	7
Employed	4	7	8	5
Migrated	6	6	3	5
	100	100	100	100

#### *Age and years spent in community*

Three families, who arrived in Araracuara during the 1970s, occupy almost 40 percent of the cultivated area. Bartolomé Castro maintains around 18 riare and 2 *chagras* (1998), Oscar Roman some 25 orchards and two *chagras*, and Marceliano Guerrero a similar number. Of the 185 plots,<sup>53</sup> only 17 are currently unsown fallows without fruit. Approximately 45 are still *natik+ipa+*. The immediate families of these three households account for another 30 percent of the plots, shared among eight households. Thus, 11 out of 66 households occupy approximately 70 percent of the cultivated area in Araracuara.

The people who form the community of Chukik+ live along the Caquetá River. The community consists of 12 households, including 80 inhabitants belonging to three Muinane clans, the Clan of Worms, *Chuumójo*; the Clan of Pineapple, *Kíyeyim+*; and the Clan of Jungle Drums, *K+mejó*. They have respectively seven, three, and two residential units. Of the 80 individual members of the community,

<sup>53</sup> Information collected through mapping and interviews.

72 live there, while five are studying outside the region and three live more or less permanently in Araracuara and Puerto Santander. The inhabitants began populating the banks of the Caquetá River from distant savannahs and forests commonly referred to as *el Centro* during the 1930s and 1940s. They were pushed out by the violence of the rubber boom and the war with Peru in 1931, and drawn by the promise of opportunities for petty commerce and paid labour, the latter from the Penal Colony and less violent rubber traders.

In 1990, Vélez and Vélez counted and described 85 *chagra* orchards belonging only to the wives and mother of the three brothers, Jesús, Jorge, and Calixto Ortiz of the Clan of Worms. These *chagras* ranged from 0 to 34 years of age. The other families of Chukik+ have a similar number of *chagras*, which in part reflects and confirms the pattern that each household make one high forest *chagra* per year.

There are more reasons for this group of middle-aged and elderly people's larger proportion of arable land than the fact that they have had more time to cultivate it. One reason, which is connected with increasing experience and access to labour resources, is the apparent tendency to make larger plots for *natik+pa+* as a person grows older. When people are just beginning to establish a family and learn how to manage a *chagra*, they usually start with smaller and often fallow plots.

#### *Access to arable land*

Until recently, there did not seem to be a lack of arable land, either in Araracuara or in and around Chukik+ upstream the Caquetá River. The region is actually known locally as the "land of abundance" (Griffiths 1998). Thus, most people manage to have their cultivated plots within 30 to 60 minutes walking distance. However, the influx of indigenous people from surrounding communities like Chukik+ have contributed to the following signs of change in access to land:

- In Araracuara, some families seem to be shortening the fallow periods of both non-orchard plots and orchards. Since the orchards, both in a cultural context and in a purely economic sense, serve as a savings account, slashing them for short-term crops is a clear indication that the natural resources are under pressure.
- One family, that of Oscar Román and Alicia Sanchez, has initiated a move from their orchards in Araracuara towards the bank of the Yari River, a two-three hour journey by foot or canoe. The Román family is the oldest living in Araracuara, and they have some of the richest orchards in the region. Alicia is famous for being one of two or three main suppliers of seeds to newly established or in-migrating families. Although lack of land is only one among several reasons for them to move, it represents a major decision. Just carrying the seeds is an arduous task.



- Attempts are increasingly being made to regulate the issuing of permits to settle and obtain access to forest land in Araracuara. This is being done through the establishment of the *Cabildo* of Araracuara. Interviews with the leader of the *Cabildo*, five different persons from neighbouring communities, and four recent settlers (of indigenous origin) in Araracuara indicate that preference is given to people with close kinship ties and, to some extent, friendship alliances. Some of those who have not received permits have settled in Puerto Santander, across the Caquetá River, even though they are discontent. Puerto Santander has very little vacant land for geological reasons.

### *Access to labour with skill and strength*

As in most types of farming, there are periods of high labour inputs and periods of lower intensity. The most labour intensive periods within the *chagra/orchard* agroforestry system are around felling, burning, sowing, weeding, and harvesting. While the first three are single events undertaken successively from the beginning until towards the end of the dry season (November through March), the latter occur both periodically and throughout the year, depending upon crop and type and age of the *chagra/orchard*.

The felling of high mature forest is usually carried out by most adult members of the family. Men fell the larger trees with axes and heavy machetes, and women clear out branches and bush vegetation. As this is very hard work and needs to be done within a timeframe that allows the dry season to dry the organic material sufficiently for successful burning, those who can, draw on help from households related by kinship or friendship. Most often these informal working relationships are paid for through reciprocal action. However, participation in some working parties and other relations are paid for in food, seeds, knowledge, or tobacco paste (*ambil*), and very seldom in cash.

Although men and women help each other in the *chagra* and orchards, there are clear-cut cultural divisions in the distribution of responsibilities for the different tasks undertaken to sustain local livelihood. This explains why 70 percent of all mature women (75 percent of all indigenous women) in Araracuara and Chukik+ define their occupation in terms of their work in and around their *chagras*, while only 56 percent of the men do so (63 percent of indigenous men) (table 4.5).

While felling is traditionally a male domain, collecting, organising, and preparing seeds are all female domains, as well as sowing and most often also weeding and harvesting. The exceptions are two major cultural plants, coca and tobacco. These are handled exclusively by men. While women spend up to half of their working hours producing in the field and processing their agricultural products, men spend up to half of their working hours producing and processing these narcotics. This calculation includes the night-times spent in ritual dialogue, preparing and consuming the coca dust, *mambe*, and the tobacco paste, *ambil*. (Griffiths 1998).

Text box 4.1: The agricultural year

	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Climate	Winds Short dry periods.	Short periods of rain ( <i>the butterflies leave</i> )		Short dry periods of 4-5 days		Longer dry periods	Long dry period	Occasional dry periods of 8 days and heavy showers	Months of rain and heavy showers		The first brief cold periods.	The month of cold periods.
Agricultural activity	Burning of small areas of <i>moggópa</i>	Sowing <i>moggópa</i> +	Some (A) fell high forest	Some (B) fell high forest	Some (C) fell large fallows	Some (A) burn their clearings for high forest <i>chagra</i> , <i>náitk+pa</i> +	Burning of (B) <i>náitk+pa</i> +. Usually burns well. Burning of (C) for <i>moggópa</i> +. (burns badly)	Sowing period, awaiting heavy rainfall.		Weeding and cleaning	Special month for weeding.	Last month of harvesting tobacco. The tobacco finalises the year.
Agricultural product	Harvesting intermediate Kaimo, Guamo and maraca	Harvesting intermediate Kaimo, and uva caimarron.	Harvesting intermediate pineapple	Proper pineapple and intermediate yellow guacure	Uva caimarron, proper Kaimo, proper peach palm and the last of pineapple.	Yellow guacure, peach palm, maracas, uvas caimarron		Green guacure, cucuy, proper avocado, marañon, guamos and end of peach palm	Green guacure, guamo and end of fruits	Empty	Empty forest and <i>chagra</i>	Empty <i>chagra</i> , Cananguc ho.
						Abundance of dances			The end of dances			

	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Non-agricultural types of work			Men often engage in building houses and nocturnal fishing in the low tide rapids of Araracuara during the dry period.							φ home: mending children's clothing, making casabe bread, awaiting rain showers		
Women's relative work load <sup>1</sup> : A:chagra B:house	A11	A13 B9	A12	A15	A10	A:23	A18	A6	A17	A8 B9	A13	A8 B8
Assistance to women's work in chagra	man and woman together		man plus friends and or relatives	man plus friends and or relatives		man plus friends and or relatives	man plus friends and or relatives	man and woman together	men			men

In the event of cold periods in June (1One or two brief periods) and longer cold periods in July, then the summer will be longer than usually (jan.-march), if the cold period is not hard and only in July, then the summer will be short.(mainly January).

<sup>1</sup> Women ranked their labour placing seeds in a drawn calendar. Clearly this does not include til work done in minga, like the ones done before a ritual dance.

Often the wife of the head of household together with unmarried daughters and especially daughters-in-law undertake the laborious daily tasks related to food production. A cautious estimate based on observation of key moments around the agricultural calendar is that women work an average of 10-15 hours daily, including all their productive and reproductive activities. Cultivating and processing different cassava products such as bread, granules, and drinks, for example, account for half of the women's weekly work (Griffiths 1998:191).

<b>Table 4.5 Occupation (18yrs+) * Ethnicity * Sex</b>					
		<b>Indigenous</b>	<b>Non-indigenous</b>	<b>Total</b>	
		n=	106	28	N=134
Male	Farmer	63	28	56	
	Fisherman	13	36	18	
	Student	11	7	10	
	Shopkeeper	2	7	3	
	Housewife	3	0	2	
	Employed	5	14	7	
	Migrated	3	7	4	
		100	100	100	
		n=	89	23	N=112
Female	Farmer	75	48	70	
	Fisherman	1	0	1	
	Student	5	0	4	
	Shopkeeper	1	13	4	
	Housewife	6	35	12	
	Employed	3	4	4	
	Migrated	9	0	7	
Total		100	100	100	

### *Forest activities*

The other very important daytime activities relevant to this project are the non-agricultural forest activities people are engaged in. As documented in a series of ethnographically informed studies (Conklin 1954; Levi-Strauss 1962, Århem 1998), some of the first and most revealing experiences with respect to the complexity, extent, and economic importance of indigenous people's knowledge of forest plant diversity occur during walks with indigenous people through the forest. The seriousness and also the joy and pride with which they demonstrate knowledge of different characteristics of plants encountered on the way is truly impressive. They not only tell about their uses and ways to prepare them, but also how to distinguish these plants from similar ones, the eco-regions where they are most common, and the spirit with which they are associated. I was particularly impressed by the ability to "see" or rather recognise plants in the forest from great distances. As mentioned in chapter three on methodology, I have chosen to focus on people's knowledge of palms. When I walked through the forest on some errand: following men who were hunting or fishing or looking for building material, or walking with women on their way to or from the *chagra* or collecting fruits, or on trips I had arranged with different persons on the lookout for various palms, I was struck by their ability to spot different kinds of palms far away in the often dense forest. Some people have developed this ability more than others, and the information people gave on such trips also varied substantially from person to person. When I first set out to study the making and maintenance of indigenous people's knowledge on plant diversity, my principal aim was to explore the foundations of the political arguments expressed by indigenist advocates (see chapter one; Kronik 1995)). One key assumption is that this knowledge is not simply tied to a few key persons. It is spread out widely among indigenous people and the making of knowledge of plants is linked to particular activities undertaken by different segments of the population. Therefore, given that the responsibilities and implementation of different activities in Araracuara are largely distributed according to sex, age, and ethnicity, it is likely that knowledge of plants dealt with during these activities is distributed in the same way. To test this assumption, I undertook a series of exercises to establish the range and preferences of palms and use-categories (Kronik 1999) and to correlate such information (including the ability to actually identify the particular species) with seemingly relevant dimensions, such as age, sex, ethnicity, and place of residence.

### **Palms**

However, before discussing the results, let me explain in some detail why I decided upon the plant family of palms as study object. I will also add briefly to the methodological account in chapter three and elaborate on certain relevant issues concerning the usefulness and validity of the exercises and the collected data.

Recent research from the Amazon underlines the pivotal importance of palms among indigenous peoples (Balée 1989; Balick 1988; Balslev and Barfod 1987) and non-indigenous and *mestizo* settlers (Phillips and Gentry 1994), both culturally and in terms of local and regional economy. Thus, palms provide a sound material basis for the study of relevant processes leading to the production and maintenance of knowledge on functional biodiversity as well as for studying how such processes are related to the social organisation of production and reproduction.

There are also further reasons for focusing on this plant group. Palms are relatively uncomplicated for the non-botanist researcher to identify, since they differ morphologically from other plants (including trees). Given the morphological character of palms and their economic importance as a source for a large variety of uses, palms are often a well-established plant domain within folk taxonomies. This is also the case in the study area in and around Araracuara, Colombian Amazon, where palms are a rather clearly defined plant group for both the Muinane and the Uitoto (Kronik et al. 1999; Sánchez Sáenz and Rodríguez 1990). With 26 genera and 64 species in the region (Galeano 1991), the plant group is of a reasonable size, with rich but manageable inter- and intra-species variation.

According to Brent Berlin's ethno-biological classificatory system, which roughly consists of six levels (kingdom, life-form, intermediate, generic, specific, and varietal), palms as a group would fall into either *life-form* (like vines, grasses, trees) or the smaller groups of generics coined *intermediate*. It is common in folk taxonomy that particularly the categories of *kingdom* and *intermediate* lack names (Berlin, Breedlove, and Raven 1974; Berlin 1992). The Uitoto seem to have no term for palms, but as indicated in a previous publication (Kronik et al. 1999), the Muinane do. They refer to palms as *suumo* and subdivide them into 13 categories. This difference gave rise to an interesting situation during fieldwork, when I found myself in a situation that I consider the "making of knowledge" or rather a "cultural negotiation of truth". I find it interesting, because it pinpoints the frontiers of a meeting of incompatible technologies, at least from a Muinane perspective: the meeting between the absolute, inalterable written text and the ever-negotiable oral language.

The community council of Chukik+ had asked me to produce an "illustrated and well-ordered" book on palms for their newly started primary school. They were keen on helping the research along, partly because such a book, with local illustrations, would focus the children's attention on something of local importance. One of the on-going debates in the process of gathering the information was agreeing upon the different names the three clans assign to palms. Often, when we were alone, or within their own clans, they would tell me that the others assigned wrong names because they did not really know, or because their knowledge base was not sufficiently grounded (i.e. based on a direct patrilinear source), or because they "failed to live a proper life". Others were more conciliatory. They said that there

are different lines of knowledge which all originate from the same source of truth. This in itself is interesting, since it diverges from or amplifies their epistemological notion of the unique character, name, and origin of knowledge: that things only exist when they have a name and that this name is assigned by the Creator. This readjustment of cultural history is an example of a tendency to develop a common meaningful discourse, a tendency that seems to be strengthened by the process of joining different clans and ethno-linguistic groups as an effect of and response to the violent meetings with modernity (see also Echeverri 1997). During the final meeting, where all three clans expressed that they had to agree on which names are 'correct' and by which principles they should be ordered, there was a tense but constructive atmosphere. Each of the 80 palm varieties and species were written down on a card, and these cards were placed and gradually ordered on the floor of one of the big *malocas*. After struggling with the 'right' ways to name, spell, and order the many palms, a new problem arose: the word with which to capture it all – a word for palms as a category. To my knowledge, and I inquired several times into the subject, the term was unknown to anyone during my entire stay. After an uneasy and long moment of silence, Jorge, a Muinane man recognised for his intellectual breadth and analytical capacities, raised his voice after everyone, including the *Casique* and the *maloca* owners, had had their chance to be heard. He said, "*It is because some people simply do not know. Naturally 'palms' have a name in Muinane. Everything that is ours has a name of our own. I have analysed the matter and found that the name is 'suuno'.*" Everybody agreed that having put it this way, *suuno* must be the true name. In this way, Jorge demonstrated his power to employ a persuasive discourse. By presenting his case as an ontological argument and providing for the 'cooling down' of an uncomfortable situation, Jorge displayed his power to introduce and establish a hitherto unrecognised fact. This demonstrates that one does not have to hold a public position to establish a 'fact'. Still, without the consent of the heads of clans, it would probably not have been established as a 'global' truth common to all Muinane people. Jorge picked his moment well. They were all gathered in a ritual place (the *maloca* of his brother) and waited until after the higher authorities had spoken.

There are several points to be made about this example. First, the whole process of making a meaningful order of this rather simple domain draws our attention to the on-going process of negotiating cultural truths and underlines the fact that for knowledge to keep on being meaningful in a changing society, it must be dynamic and processual. The example also helps to understand the problems such communities face when having to negotiate more complex relations and knowledge domains. Second, it brings out the issue of power. Although the whole community participated, only a few displayed the power to decide by which principles the palms should be ordered and how to settle conflicts over names and order. The participants were all mature and elderly persons with cultural and/or modern leadership positions in Chukik+. And although the modern leaders had their say,

they always looked to the traditional leaders to validate their remarks. Third, the example cautions us not to take the following statistical account as indisputable truth. Rather, it presents one among several sources of information, thus qualifying the importance of certain activities to the societal distribution of knowledge of a limited domain, in addition to displaying the rich aggregate of knowledge within it.

#### *Palms - a culturally salient and rich domain*

A first indication of the variation and richness of knowledge about the usefulness of palms can be drawn from table 4.6, and a number of suggestions can be made for the methodologically interested on the basis of the lessons learned from performing four distinct ethno-botanical exercises, albeit with a similar focus.

The exercises mentioned in table 4.6 (see chapter three for more detail) provide a wealth of information on past and present uses and names. Ethno-biologists and others have employed this type of information for analyses into the nature and structure of folk classification systems since the historic dissertation of Harold Conklin (1954). This area of mainly cognitive research is summed up in a few recent publications (Berlin 1992; D'Andrade 1995). One of the general principles for ethno-biological categorisation outlined by Brent Berlin asserts that the subset of plants and animals recognised conceptually by a given society (compared to the complete number of plants in the area) is comprised of the most salient ones in the local habitat. He defines salience as a function of *biological distinctiveness*. This implies a principle of maximum variation. This hypothesis is supported by my research when we look at the entire 'subset'. However, I wish to add to this a principle of *cultural salience*, without which we will hardly get beyond philosophical speculation. An important step in this direction is taken by another, very related field of analysis, which is informed by the same types of information. It focuses on the social distribution of both taxonomical knowledge and knowledge of the categories of uses maintained within a socially, culturally, or spatially defined group of people. This type of largely quantitative research has fed ecological anthropologists and political ecologists with a bulk of evidence of the vast extent of indigenous peoples' knowledge of plant diversity in the Amazon, among other places. It has also sustained their assumption concerning a positive relationship between cultural models of use, exchange, and conservation of plant diversity and its very ecological characteristic. This has led to the provocative and much debated hypothesis about the anthropogenic forest, where indigenous peoples have had a significant continuous shaping impact over time upon the ecological composition of the rain forest and increased its diversity (Balée 1989; Posey and Balée 1989). The quantitative approach is continuously refined, and one of its best examples is the article by Phillips and Gentry (1993), in which they develop a stringent methodology and analytical framework for gathering and analysing the



extent and distribution of such information, referred to as “ethno-botanical knowledge”. I largely follow Phillips and Gentry’s guidelines in the following analysis of the social distribution of knowledge on palms.

<b>Table 4.6: Overview of palm exercises</b>	<b>No. of palms</b>	<b>No. of use categories</b>
Total number of palms and use categories mentioned during narratives. Vicente mentioned 54 palms by name, Mariano 56, and Honorio 53. Mariano later added 11 palms.	81 palm species and varieties	101
Total number of palms found during forest and field walks (Kronik 1999)	80 species and varieties	NA
Total number of palms and use categories mentioned during free-listing of 15 most important palms	47	66
Total number of use categories mentioned during identification exercise with 23 selected common and rare species	NA	69
Total number of palms and use categories physically observed during the full length of fieldwork	51 palm species	58

As advised by my key indigenous counterpart and informants, I began the study of knowledge of palms with a ritual narrative in each of the communities I worked in, followed by a number of forest walks “so that I could see for myself that they do not lie”. The narrative was given during a night-time ritual session by a cultural authority. Vicente Makuritofe, one of the traditional counsellors of Araracuara, presented each of the palms with a description of its place in ritual history. He added brief comments about the origin of the nomenclature, referring to the spirits who own and guard them, and specifying some of the criteria by which ‘lower’ or related ranks of palms were to be distinguished, such as colour, taste, or ecological habitat. Mariano Suárez, who owns a large *maloca* in Chukik+, simply listed the names of palms one night and advised me to do the same with the other heads of clans, to cover the nuances of the entire ethnic group. Honorio Mukutuy, the old *Casique*, did the same, stressing however that he had “left a few palms for the last clan leader”. When I asked why he did not give me a complete list, he referred to their status as owners of a *maloca*. They had to live up to this position by demonstrating that they were worthy of the title. When I asked the three old men to list the uses of each of the palms, they all explained on separate occasions that this is ‘daytime work’. During the night- and day-time exercises, the entire range of palms known to the Uitoto and Muinane was collected, and a very wide range of past and present uses was noted. The use

categories tell a tale of historical changes and the introduction of new products and technologies. Due to these changes, certain uses have become superfluous through introduction of competing products (like spines for fishing hooks and blowgun darts). Other uses have been forgotten or are simply no longer part of daily routines (like different fish and bird traps). During later exercises, I found several uses of palms that had been recently developed and introduced. For example, certain branches are used to fix tin roofs; a special palm leaf is used to powder and recharge used shotgun shells; and a variety of vegetable salt turned out to have special remedial effects.

All but one of the palm species and varieties were found during walks in the forest and to the orchards and fallows at different stages (see Kronik et al. 1999). The missing palm apparently only grows in their ancestral territory, something I have been able to look up.

The free-listing exercise was a simply an enquiry into intra-cultural variation and preferences of palms. I asked a number of informants to list 15 palms of their choice. The exercise revealed an expected but not uninteresting point. While the five culturally and economically most important palms were included in almost all of the informants' free-lists, the fact that 47 palms were mentioned in addition to the many use categories indicates the importance of palms locally and the fact that knowledge of them is widespread.

After the series of qualitative inquiries, an ethno-biological exercise was carried out on a plot with 23 different palm species in order to understand and explain the social distribution of ethno-botanical knowledge in more detail and to facilitate a further analysis of the impact of contact with modernity. Given the larger sample of informants (N=41<sup>54</sup>) and palms (N=23) than the free-listing exercise and the concreteness of the situation, the exercise should enable a more accurate exploration of the distribution of ethno-botanical knowledge among people in the two communities.

Each of the persons involved in the exercise was asked to (i) identify the palms by name (Uitoto, Muinane, or the vulgar name) and (ii) to indicate the services they provide (uses). Of course, this is not a complete inquiry into indigenous peoples' knowledge of palms, since for example agronomic, ecological, and ritual types of knowledge are not included. Therefore, it cannot be expected to provide an

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<sup>54</sup> Forty-one persons were sampled according to their dominant livelihood strategies, taking into account representation of the criteria identified in the free-listing exercise (stratified considering gender, ethnicity, age, occupation, social and cultural status, and access to forest products and the market). The sample consisted of 16 women and 25 men. 40 of them were between the ages of 18 and 78 years (a 14-year-old was omitted from the age analysis). 18 were Uitoto, 22 Muinane (one "other" was omitted from the ethnicity analysis). 25 live in the "centre" village of Aracuara and 16 upstream in Chukik+.

unbiased picture of the distribution of knowledge. This is also the case, since women, for instance, tend to know more about agronomy than taxonomy, and they frequent other and perhaps fewer ecological zones and habitats than men do.

### **Relevant dimensions for the distribution of knowledge on plant diversity**

#### *Gender-specific organisation of production and reproduction*

As mentioned above, the gender division of the knowledge in question is only a partial perspective on the various bodies of knowledge existing in the region at a given time. However, given the rigorousness of the methodology in ensuring that shyness etc. were taken into consideration, and noting the ethno-botanical information elicited from the palm identification exercise, it seems reasonable to conclude that gender-specific organisation of production and reproduction is relevant to the distribution of taxonomical and utilitarian knowledge on palms.

The fact that palms (except for two cultivated species) are found in the closed and secondary forest, where men spend more time and perform more activities than women, does represent a bias in favour of men. While the exercise focuses on palms at the species level, women know more about palms at the varietal level. This is due to the fact that there are only a few cultivated palm species that are primarily used for consumption, but they are found in many varieties (Kronik 1999). This, however, only supports the thesis that knowledge on plant diversity depends upon the human activities the individual takes part in. Men identified significantly more palms than women (see table 4.7). Men also mentioned significantly more use categories in total, and for the two technology aggregates, for utensils (surprisingly), hunting, ceremonial and medicinal uses. A further explanation for this is found in the cultural organisation of people's livelihood. Women are kept from important learning institutions that focus on taxonomic and botanical knowledge (as we shall see in chapter five) and are excluded from certain knowledge domains relevant for ethno-botanical knowledge. It is common for men to say that women do not have the capacity to deal with certain aspects of healing, for instance, so they are never required to have knowledge of certain forest plants.

Men and women mention equally as many use categories per palm (average six). There are no significant differences in the use categories of agriculture, food, crafts, and construction. This coincides with much of their domains in production and reproduction. The standard deviation is rather high among men. Together with the previous result concerning age, this indicates that there may be a certain group of older men who mention more use categories and recognise many palms.

<b>Table 4.7: Use by sex</b>			
<i>Identifying palms and indicating uses in plot With 23 palms</i>	Men n=26	Women n=15	Total N=41
Total number of use categories mentioned per person	57.54**	40.33	51.24
Number (of the 23) of palms identified	21.84*	15.53	19.54
Number of uses mentioned per palm	6.22	6.10	6.17
<b>Technology 1</b>			
Number of construction, utensils, crafts, Agriculture, and hunting-related use categories	27.31**	19.53	24.46
<b>Technology 2</b>			
Use categories related to utensils, crafts, Agriculture and hunting.	19.88	12.8	17.3
<b>Food-related use categories</b>	18.08	14.87	16.9
<b>Construction-related use categories</b>	7.42	6.73	7.17
<b>Utensil-related use categories</b>	4.38**	2	3.51
<b>Craft-related use categories</b>	6.42	5.67	6.15
<b>Agriculture-related use categories</b>	1.27	.73	1.07
<b>Hunting-related use categories</b>	7.81**	4.4	6.56
<b>Ceremonially related use categories</b>	7.5*	4.93	6.56
<b>Medicine-related use categories</b>	4.08**	.8	2.88
<b>Hygiene-related use categories</b>	.5*	.2	.39
Level of significance by Kruskal Wallis non-parametric comparison of means **(<0.05) *(<0.1)			

We can conclude that gender is relevant to knowledge of palms in this region. Similar findings can be found in Phillips and Gentry (1993) and in Caniago and Siebert (1998).

### *Age-specific organisation of production and reproduction*

Age, or rather life-cycle, was the most important dimension referred to, when I asked 16 persons on a one-to-one basis: “Where would you go to obtain knowledge, for example, to establish whether a fruit is edible or poisonous?” Fourteen responded that they would ask an elderly person, and the two remaining answered, “The most knowledgeable”. Going through the interviews, old age is mentioned over and over again, especially concerning agronomic, ecological, and taxonomic knowledge.<sup>55</sup> But age cannot be an isolated dimension. It is not true, for example, that every old person knows a lot about plants. Some do, some do not.

#### The distribution of knowledge of palms according to three different life-cycles

One of the often mentioned indicators of a person’s knowledge of plants, both locally and in literature (Phillips and Gentry 1993), is the stage they have reached in life. This is sometimes measured by the number of years the person has lived or simply by referring to the word describing such stages: ‘elder’, ‘mature’, ‘youth’, ‘child’ etc. In the tables below, people are ordered in three categories relevant to important phases in a ‘typical’ local person’s life. This is largely a local classification of age, supported by observation in the field.

The first category is from 18-38 years, the period when a person establishes a family, a home, and a way of life. Among this group are also found most community/administrative leaders with a variety of contacts with modern society, since they have less family obligations and usually higher levels of Western education.

The second category is from 39-49 years, when life and one’s activities mature. Ideally, living conditions are now less difficult, since the fruit plantation, which can be understood as a pension scheme or savings account, starts providing food and other products in abundance. People in this age group receive, for example, the responsibility for teaching their first grandchildren, often living under the same roof or close by.

The third group starts at age 50. A few of these are “owners of *maloca*” and have completed one or several careers within the cultural education organised around dances (see Kronik 1997). Ideally, they should have plenty of food and knowledge and a strong social network, though in reality people over 50, just as those in other age categories, fall into all local categories of livelihood strategies.

Table 4.8 reveals a clear and significant (<0.05) trend that the older a person becomes, the more likely he or she is to know more kinds of uses (mean of younger = 37, older = 49, and oldest = 66). Hence, knowledge on plant diversity is not

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<sup>55</sup> See Annex 3, guide for conversational interviews – questions no. 3, 5, 29, 31, 34, 35.

equally distributed among young and old. Elderly individuals (from 50 years) mention significantly more use categories in 7 out of 11 use groups and an additional use group at the <0.1 level. The sub-groups of medicine and hygiene follow the trend but are not statistically significant. Therefore, we may conclude that age is relevant to knowledge of palms. Similar findings can be found in Phillips and Gentry (1993) and Caniogo and Siebert (1998).

<b>Table 4.8: Use by age</b>	Younger	Older	Oldest	Total
<i>Identifying palms and indicating uses in plot with 23 palms</i>	18-38 n=13	39-49 n=14	above 50 n=14	N=41
Total number of use categories mentioned per person	37.38	49.14	66.21**	51.24
Number (of the 23) of palms identified	17.77	19.14	21.57	19.54
Number of uses mentioned per palm	2.79	5.68	9.82	6.17
<b>Technology 1</b>				
Number of construction, utensils, crafts, agriculture and hunting related use categories	17.69	24.57	30.64**	24.46
<b>Technology 2</b>				
Use categories related to utensils, crafts, agriculture and hunting	11.69	17.36	22.43**	17.29
<b>Food-related use categories</b>	13.31	15.79	21.36**	16.9
<b>Construction-related use categories</b>	6	7.21	8.21**	7.17
<b>Utensil-related use categories</b>	1.85	3.29	5.29**	3.51
<b>Craft-related use categories</b>	4.85	6.5	7**	6.15
<b>Agriculture-related use categories</b>	.38	1	1.79**	1.07
<b>Hunting-related use categories</b>	4.62	6.57	8.36	6.56
<b>Ceremonially related use categories</b>	4.08	6.29	9.14*	6.56
<b>Medicine-related use categories</b>	1.77	2.29	4.5	2.88
<b>Hygiene-related use categories</b>	.38	.21	.57	.39
Level of significance by Kruskal Wallis non-parametric comparison of means **(<0.05) *(<0.1)				

I did not include children and youth under the age of 18 in the above exercise, as it turned out to be difficult for practical reasons. This group is important, however,

because the choices they make and the interests that motivate their engagement may indicate future directions and trends concerning ways of living, how to organise production and reproduction etc. Therefore, I have paid particular attention to the activities different types of children engage in during different stages of their lives. And they do have rather marked stages that roughly fall into three age categories: 0-6 years, 7-12 years, and 13-18 years. This varies with differences in gender, parents' occupations, and whether they are the first in the flock.

*Text box 4.2: Tato's pride*

During the first days of my first visit to Chukik+ and the *maloca* of Mariano, I planned to go with Mariano to try to identify as many as possible of the palms he had mentioned in his narrative the night before. For two long days, we walked the forest thin identifying 46 different species. Mariano brought his youngest son, Tato, who was eight years old at the time. He was clearly a bright kid, who often spends his time with one or the other of his parents and lately mostly with his father. While walking, he kept naming and identifying palms of the sort we had recently found. He had no sense or fear of being ridiculed for asking funny questions or making mistakes in his claims to know the different palms we saw on the way. During the following days, he demonstrated his new knowledge of palms to his much older brothers, teasing them for not knowing and feeling proud when he could tell them why they were wrong, indicating the shape of a leaf or the colour of the spines on the trunk.

The older brothers demonstrated theoretical knowledge (in this case, taxonomic and botanical) of how to distinguish the palms, but as they spend most of their time at boarding school, they had very little factual knowledge, such as the names of the plants, especially not in the father's language, Muinane, and only some in their mother's, Uitoto (field notes 1997).

During the first 5-6 years, children follow their mother. During this time, they must learn to endure the heat of the sun in the open field and to avoid harmful insects and animals. By the age of 3-5 years, most children of mothers who cultivate a *chagra* can distinguish between edible and poisonous fruits found on the path to and from the *chagra* and in the fruit plantations. They also know most of the food crops and start helping in the field, weeding and sowing. Children are encouraged to help sow the fruit trees, "so that they will carry the fruits at a low height", and they enjoy the responsibility given them during reproductive activities, such as peeling cassava, fetching water, taking care of younger children etc. From this time onwards, they increasingly split up according to gender. The boys start following their fathers, and the girls continue with their mothers. The responsibilities increase, and their games relate to the capacities they must acquire. Boys from 7-10 years old, whose fathers work in the forest and take them along, generally know how to catch fish, paddle a canoe, clean and cook fish, make a bonfire,

harvest coca and pull and carry cassava. They also know which species of trees are good for firewood, and they can identify bigger trees and palms, mainly those bearing fruit, and a few common herbs. They know some names of fish, animals, and reptiles, and some know which palms are good for making salt, and which woody climbers serve as rope. Children of *malocas* know how to braid the simplest types of baskets.

Girls' responsibilities are more visible than boys' and probably also more comprehensive. As one mother told me, from around the age of 7-9, girls'

*... knowledge and practice does not come primarily from playing, but from duty or work. From this moment on, she is not a girl any longer, but a young woman. From the age of 15 years, she should start practising making casabe and help squeezing the matafrio cassava press. She should not wait for the mother or grandmother, but go straight to fetch cassava on her own (Juana Suarez 1997).*

This is also the time when children start in school. The children from Chukik+ stay at boarding school in Araracuara, sometimes living with families there but mostly at the school (and church). Only recently, Chukik+ opened a small school for the first two-three grades. It had not yet started when I left in March 1998, but the plan was to start that year.

Raising children in this way and assigning them various tasks in and around the forest and cultivated land seems indicative of people's attitudes toward and knowledge of the forest. Persons who have had access to the forests and cultivated land during their youth, in contrast to those who have not had such experiences because their parents worked elsewhere,<sup>56</sup> generally demonstrated more interest in and capability to draw upon the diversity of plants, when they were asked how to confront various problems.<sup>57</sup> The old *Casique*, Honorio Mukutuy, from Chukik+ was well aware and deeply concerned about this. He told me that children have an interest in learning about the forest, and that he had the obligation and wish to teach them, but that other things, such as school, tend to draw children's attention away from the forest.

In the region, the subject of multi-ethnic education has been discussed since the new constitution of 1991 declared Colombia to be a multi-ethnic and pluri-lingual country. According to the president of the regional indigenous council, CRIMA, three different positions emerge among indigenous people. One group wishes to re-conquer the lost space and bring education back to the parents and cultural

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<sup>56</sup> The parents may have worked at fishing or been employed by the school, church, or merchants, worked as guards or otherwise at the prison institution, or they may have migrated temporarily.

<sup>57</sup> Judged on the basis of participant observation, inquiries into the livelihood strategies people embark on later in life, and a series of experimental activities with different types of households.



institutions. Others do not wish education to be spread out and thus produce what they fear would be a lower standard than the rest of the country. A third group, the vast majority, wish a combination of indigenous and Colombian education, which would have both a local and national context. A Colombian NGO is facilitating the process of establishing the curriculum and framework for this sort of education. It faces many problems and conflicts. One of the problems is getting qualified teachers to take over from the missionaries and from the state; a second is the problem of didactic material; and a third, and probably the most complicated one, is to agree upon a curriculum and methodology. The elders and the traditionalists object to the fact that girls and boys learn the same, partly because certain knowledge domains “*are not meant for girls*”. The teachers at the boarding school have stopped teaching indigenous languages, since they are faced with the problem that there are classes with up to seven different ethno-linguistic groups.

The teachers were confident, however, that the problems can be overcome and that debating and defining the differences and similarities between the local and national education and learning systems have strengthened both sets of institutions. The teachers told me that children attending the school are now much more aware of the value of both the school and the local institutions and practices. The school requires knowledge about local themes that the children can only acquire at home, and their communities and families require knowledge that the children can only obtain from the school. The young leaders of the indigenous ‘outward’/-administrative/governing institution, the *cabildo* (village council), who are influenced by this process now say that both forms of education are needed:

*Indigenous ways of living and learning to survive and live well, and Western knowledge to earn money for necessities* (minutes from a CRIMA meeting).

### *Ethnicity*

Knowledge on plant diversity does not seem to be equally distributed between the two ethnic groups; however, judging from other sources of information, intra-cultural ethnic differences do not seem to be of significant importance.

Table 4.9 indicates that the Muinane name more use categories than the Uitoto. The two ethnic groups name more or less the same number of uses per palm (Uitoto = 5 and Muinane = 7) and recognise the same number of palms (Uitoto = 19 and Muinane = 20).

The majority of the Muinane interviewed live in Chukik+, a community that is further away from daily access to market and modernity. They have more communal houses, *malocas*, and thus host more learning institutions of dance and *mambeadero*. It is thus possible that the single variable of ethnicity is not enough to explain the variation in knowledge of palms. This is supported by literature from the region (Echeverri 1997) and the local people themselves, who say that

the different ethnic groups share the same culture, though with some variation. The reasons for this variation may rather be found in livelihood strategy, access to market and non-local institutions, and participation in cultural learning institutions.

<b>Table 4.9: Use by ethnicity</b>	Uitoto	Muinane	Total
<i>Identifying palms and indicating uses in plot with 23 palms</i>	n=18	n=22	N=40
Total number of use categories mentioned per person	44.22	57.77	51.68
Number (of the 23) of palms identified	18.72	20.09	19.48
Number of uses mentioned per palm	5.02	7.32	6.29
<b>Technology 1</b>			
Number of construction, utensils, crafts, agriculture and hunting use categories	20.56	27.86*	24.58
<b>Technology 2</b>			
Use categories related to utensils, crafts, agriculture and hunting	13.86	20.23*	17.35
<b>Food-related use categories</b>	15.89	17.95	17.02
<b>Construction-related use categories</b>	6.72	7.64	7.23
<b>Utensil-related use categories</b>	2.67	4.23*	3.53
<b>Craft-related use categories</b>	5.5	6.59	6.1
<b>Agriculture-related use categories</b>	.72	1.41	1.1
<b>Hunting-related use categories</b>	4.94	8**	6.63
<b>Ceremonially related use categories</b>	5.61	7.55	6.68
<b>Medicine-related use categories</b>	1.83	3.86*	2.95
<b>Hygiene-related use categories</b>	.33	.45	.40
Level of significance by Kruskal Wallis non-parametric comparison of means **(<0.05) *(<0.1)			

### Occupation

People's knowledge production is affected by whether their livelihoods are sustained only or primarily by local forest-based agriculture, or partly or entirely through other forms of occupation.

Given the rather small sample, only two categories were made: those mainly working in indigenous agriculture, and those who in some cases do have *chagras* but mainly work with other things (fishing, day labour, logging, selling, or employment by the government, institutions, or NGOs).

<b>Table 4.10: Use by occupation</b>	Agriculture	Non-agriculture	Total
<i>Identifying palms and indicating uses in plot with 23 palms</i>	n=28	n=13	N=41
Total number of use categories mentioned per person	53.14	47.15	51.24
Number (of the 23) of palms identified	19.61	19.38	19.54
Number of uses mentioned per palm	7.62	3.07	6.17
<b>Technology 1</b>	24.86	23.62	24.46
Number of construction, utensils, crafts, agriculture and hunting use categories			
<b>Technology 2</b>	17.64	16.54	17.29
Use categories related to utensils, crafts, agriculture and hunting			
<b>Food-related use categories</b>	17.57	15.46	16.9
<b>Construction-related use categories</b>	7.21	7.08	7.17
<b>Utensil-related use categories</b>	3.28	2.85	3.51
<b>Craft-related use categories</b>	6	6.46	6.15
<b>Agriculture-related use categories</b>	1.21	.77	1.07
<b>Hunting-related use categories</b>	6.61	6.46	6.56
<b>Ceremonially related use categories</b>	7.11	5.38	6.56
<b>Medicine-related use categories</b>	3.11	2.38	2.88
<b>Hygiene-related use categories</b>	.43	.31	.39
Level of significance by Kruskal Wallis non-parametric comparison of means **(<0.05) *(<0.1)			

Knowledge on the diversity of palms seems to be equally distributed regardless of whether people's livelihoods are sustained only or primarily by local *forest-based agriculture*, or partly or entirely through *other forms* of occupation.

Taking good care of one's agricultural production (including the fruit plantations after the first two years of more intensive production) is a local indicator for living 'the indigenous way', defending 'the good life'. However, two biases may occur. Palms are not important in agricultural production (apart from two species, *Bactris gasipaes* and *Mauritia flexuosa*), and for some people, engaging in non-agricultural income-generating activities does not prevent them from having highly diverse *chagras* and home gardens. Agricultural production seems relevant for further study, but not as an isolated element. Maybe this will become clearer in regard to local categories for livelihood strategies.

The above variable turned out to be a good indicator. No significant differences are found in table 4.10. Knowledge of palms is not specific to working in agriculture. This indicates something interesting, which is that people with other sources of income than forest-based agriculture know of and apparently use the plants of the forest – or have other sources of information about it, such as kinship and friendship alliances and participation in institutions like the *maloca*, the *mambeadero* and the dances.

#### *Differentiated daily access to market and natural resources*

The categories here depend on the community in which the informants live. The communities were initially chosen for their different access to the market and Colombian and international institutions (school, army base, traders, shops, settlers, and church) and for their differences regarding access to natural resources. Araracuara has more daily contact with modernity, as it hosts various national and international institutions and is the commercial centre and entry/exit point for the region. Rapidly expanding population has placed increasing pressure on forest and other natural resources.

The second community, Chukik+, lies 70 km upstream from Araracuara, with more closed forest nearby. Usually, the people of Chukik+ visit Araracuara bi-weekly to sell food to the boarding school and others, buy soap, salt etc., and meet with friends and relatives.

Table 4.11 indicates that there are considerable differences in the number of use categories listed by people from the two communities, Araracuara and Chukik+, with high/low daily access to market and low/high access to relevant natural resources, respectively. Thus, knowledge on plant diversity of palms is not equally distributed between the two communities, which have different (daily) access to market and natural resources.

<b>Table 4.11: Use by community (access to market/natural resources)</b>	Araracuara n=25	Chukik+ n=16	Total N=41
<i>Identifying palms and indicating uses in Plot with 23 palms</i>			
Total number of use categories mentioned per person	46.08	59.31	51.24
Number (of the 23) of palms identified	18.84	20.63	19.54
Number of uses mentioned per palm	3.00	3.43	5.86
<b>Technology 1</b>			
Number of construction, utensils, crafts, agriculture and hunting use categories	22.04	28.25	24.46
<b>Technology 2</b>			
Use categories related to utensils, crafts, Agriculture and hunting	15.2	20.56	17.29
<b>Food-related use categories</b>	16.04	18.25	16.9
<b>Construction-related use categories</b>	6.84	7.69	7.7
<b>Utensil-related use categories</b>	2.8	4.63*	3.51
<b>Craft-related use categories</b>	5.92	6.5	6.15
<b>Agriculture-related use categories</b>	.84	1.44	1.07
<b>Hunting-related use categories</b>	5.64	8	6.56
<b>Ceremonially related use categories</b>	5.8	7.75	6.56
<b>Medicine-related use categories</b>	1.96	4.31**	2.88
<b>Hygiene-related use categories</b>	.24	.63**	.39
Level of significance by Kruskal Wallis non-parametric comparison of Means **(<0.05) *(<0.1)			

People from Chukik+ named more uses in all categories. Thus, living further from the market (etc.), with more (frequent) access to more closed forest and thus forest products and services, means that palm diversity (and most probably plant diversity, in general) is used for more purposes.

## Conclusions about knowledge and place

The results point rather overwhelmingly to the importance of the social organisation of production and reproduction for the knowledge expressed by different segments concerning the usefulness and visual characteristics of the highly diverse plant group of palms. However, it is also clear that each of these dimensions (sex, age etc.) cannot alone explain the distribution of knowledge. It does not necessarily make sense to group all men, all the old, or all the Muinane together. The variation within each segment is at times rather high. Thus, other factors must be introduced, such as social position, the vicinity of certain biophysical or other conditions, or simply personal interest. For example, there are clearly families where the interest in and efficiency of learning processes are greater than for other families. This would explain why most of the members of this family might know more than most other people of similar age. Unfortunately, the data from the palm identification exercise cannot support a multivariate analysis, as this would demand an almost complete sample. This was impossible for practical reasons. However, certain relations can be established with high probability, by joining the conclusions from the palm exercise with the interviews and taking the consistency of the answers into account. Based on these sources, we may conclude that mature and elderly women, who participate in cultural institutions and have a long life of making *chagras*, are the most experienced and knowledgeable on a range of issues and domains, including agronomic knowledge. Likewise, mature and elderly men, who participate actively in cultural institutions and have spent a large part of their lives walking the forests, seem to have deeper insights concerning what we would term a blend of agro-ecological and spiritual knowledge, as well as botanical classification. Together, these two groups know a lot about health problems and plant diseases.

Now, demonstrating the importance of place and of the activities carried out for the existing knowledge should not and does not come as a surprise. What is surprising, however, is that Araracuara is far from being an “ancient and little-disturbed Indian site” where such conclusions would be even less startling. Araracuara is a newly founded community, which has developed around modern institutions and is therefore not influenced by cultural institutions to the same degree as the communities where the inhabitants migrated from. The people who settled here over the last 30 years were mostly young people and families searching for better access to income-generating activities, to the school, and the market – and several were ‘pushed’ out of their communities from upstream and downstream the Caquetá River. However, people seem to be following the same cultural learning processes, and the same systems of communication seem to mark their presence. What may be expected from a place like Araracuara, which is often seen as the first step toward modernity, is that the young enter processes of de-traditionalisation or acculturation. However, this is certainly not the only trend. On the contrary, Araracuara has seen a strengthening and revitalisation of cultural

institutions during the last ten years. This has further empowered the cultural mechanisms for settling truths concerning knowledge of plants, for example. However, these mechanisms are in many respects controlled by the older generation. This means that the dominating cultural discourse of how people are to deal with natural resources proves to be of great importance. This discourse, however, excludes the women and some younger men from participating in making some decisions and even in some knowledge domains.

These indications of the relevance of different types of participation in certain cultural institutions and learning processes require further analysis. This is the main concern of the following chapter.

## The Dance of the Fruits



**Belisario Castro painted as jaguar**



**Woman bears cassava tubers**



**Photos from the movie "Dancing with the Fruits of the Earth", Kronik & Krøyer, 2001**



# Maloca life



**Belisario leads the preparations**



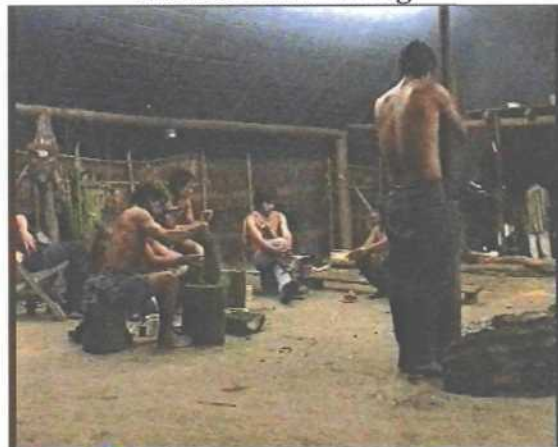
**Belisarios maloca**



**Belisario Castro and Aurelio Suarez in mambadero dialog**



**Tobacco paste to be mixed with vegetable salt**



**Mambadero**



**Coca leaves are toasted**



**Young Belisario sucks ambil**



**Inside the maloca**

## CHAPTER 5

### KNOWLEDGE AND CULTURAL INSTITUTIONS

#### Introduction

"Living is about evacuating knowledge", the old *Casique*, Honorio, told me, and he continued:

*To do this we must endure thirst, hunger and long nightly hours of staying awake... However, this knowledge is worth nothing if we cannot put it to use. During daytime we must try it out to see how it works for us as an individual, and to demonstrate to others that we do not carry lies, so that our words can be trusted (Honorio Mukutuy, Casique of Chukik+ 1997).*

In the Araracuara region, which encompasses both the communities where I carried out my fieldwork, the dominant cultural construct of knowledge is that it is an absolute, complete 'package'. It is transferred to unborn children while in their mothers' wombs, through the media of *ambil*.<sup>58</sup> However, at the moment of being born, the entire package is forgotten. "As we all know, a new-born child knows nothing", Honorio Mukutuy says. This understanding of the origin and character of knowledge is interesting in the sense that people do not place ownership to knowledge at the individual level, as is the tendency in Western societies.<sup>59</sup> It also differs from our understanding of knowledge production. The dominant Western understanding of knowledge production is expansive, valuing new discoveries and innovations. The Muinane and the Uitoto epistemology, on the contrary, sees innovations as lies or as information based upon ideas which are alien to their realm of dominance, until the information has been established as cultural fact pertaining to the package referred to. So there are processes of learning involved in whatever activity one is engaged in, and there are processes and mechanisms for validating and disputing and thus distributing or discarding such information. In the previous chapter, I argued that social and biophysical conditions are relevant to the distribution of plant-specific knowledge. As the organisation of production and reproduction is differentiated along such dimensions as gender, age, and place, so is seemingly the distribution of knowledge. However, it also became clear that these activities, dimensions, and conditions only provide an incomplete explanation of the unequal distribution of knowledge on plant diversity. This

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<sup>58</sup> *Ambil* is a special tobacco and vegetable salt liquidate.

<sup>59</sup> See chapter one on the international debate on intellectual property rights.

corresponds to the results of Descola's work with the Achuar of the Ecuadorian Amazon. Here, he shows how the quality and diversity of the material outcome of activities like gardening depend on the ability to draw on insights developed on the basis of cultural logic, rather than what he calls "*the sphere of practical reason*", such as environmental constraints and access to available work force etc. (Descola 1994). As I will demonstrate in the following, a further understanding of this requires a closer look at the production and reproduction of knowledges. To do this, we must elicit and follow the relevant learning processes and explore the mutually related<sup>60</sup> practices and institutions.

An obvious entry point is to address the processes leading to the 'evacuating' of knowledge that Honorio refers to above. In my interpretation, 'evacuating knowledge' means culturally developed ways of rediscovering the knowledge that the Muinane and Uitoto believe is given by the Creator. The role of mankind is to 'activate' the good and true knowledge from this package through social interaction: endless inquiries and social, cultural, and 'practical' processes of verification.

In this chapter, I explore the nature and importance of the more – and sometimes less – formalised ways in which people seek to capture, employ, and verify knowledge, both as individuals and primarily as social groups. This is followed by an analysis of the character of salient institutions and practices in which these processes seem to be embedded. After this, I address the importance of these institutions and practices for the knowledge people have and generate, discussing how knowledge production not only depends upon place and concrete experiences but also upon cultural and religious institutions. Finally, these institutions are placed in the socio-political context that influences them. A necessary part of the analysis is a description of how these processes are defined and institutionalised locally.

For this purpose, I have chosen to focus on two central cultural institutions: the *mambeadero*<sup>61</sup> and the dance ritual, which include and/or relate to a number of individual and collective learning processes and more or less concrete practices. Together, they stand out in the cultural construct of which knowledge production is part. The *mambeadero*, the indigenous male 'intellectual forum', is held most evenings and nights in the large palm-thatched houses called *maloca*.<sup>62</sup> In the *mambeadero*, men from around the age of 14 gather to reflect over daily events and to debate and/or solve questions of health, social and ritual anxieties, and

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<sup>60</sup> I refer here to the phenomenon that learning processes are not only embedded in institutions, but that these may also be built and maintained around the learning processes.

<sup>61</sup> *Mambeadero* is a place in the centre of the *maloca* where the *mambeadores*, the male coca-eaters, sit during the night.

<sup>62</sup> Residential unit, a palm house, often used for communal activities and as the seat of the ritual careers celebrated by ritual dances.

other problems. During these sessions, they often draw upon, discuss, and dispute such different aspects as insights concerning social and cultural relations; the proper ways to come to 'live the good life'; as well as ritual discourses on conflict resolution or botanical and taxonomic issues. Tobacco paste and coca dust (*mambe*) are produced, shared, and consumed. The cultural career or education, which is related, celebrated, and evaluated in a series of dances, also takes place in the *maloca*, as well as a number of daily home-bound tasks that are part of the individual and communal work, such as processing food crops etc.

## **General learning processes - also for knowledge on plants**

### **Of day and night**

One of the first observations a researcher makes upon visiting this region is that something very different happens during the night than during daytime activities. It is almost as obvious as the gender division in the organisation of work and leisure time activities. As Aurelio Suarez says, "*There are two people – man and women – and there are two days – day and night*" (Kronik and Krøyer 2001).

The People of the Centre engage in different gender-specific forums during the late evening and night. These are hours for reflection and inquiry and teaching in the *maloca*. This differs substantially from the daytime activities dominated by processes of experimentation and demonstration. In using this temporal division, I am following a cultural division proposed locally, which reflects a male-dominated division and is thus bound to present the study with a gender bias.<sup>63</sup>

By this day and night distinction, I do not wish to separate action from mental activity, but rather to draw attention to the different types and combinations of learning processes that take place and are being institutionalised.<sup>64</sup> In chapter two, I break up action into both routine-like and research-like activities. Both these

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<sup>63</sup> This is a bias often found in ethnographic and other types of studies; however, it is not always reflected upon. In order not to exclude learning specific to women, who do not participate in the dominant night-time institutions since they go to bed after supper, I discuss their networks and moments of reflection and interaction mainly in the "daytime" section. As a male researcher, I gained comparatively good access to the "*mambeadero*", which is exclusively a male forum. For this same reason, I have had very limited access to female forums and processes of reflection such as "*a pie de fogón*" (sitting by the kitchen fire) or extra-household working parties, the so-called *mingas*. However, I have used available opportunities to inform my partial perspective on women's knowledge production and views about knowledge. Herewith, I acknowledge that I am aware of the limits this implies for the comprehensiveness of the conclusions that can be drawn from the following analysis.

<sup>64</sup> And which are continuously disputed and shaped within different types of human interaction.

types of activities are present around the clock. The point is, however, that the character and composition of these vary substantially. I demonstrate in the following that the People of the Centre have developed a comprehensive system of inquiry, dispute, and reflection, which they, for various reasons,<sup>65</sup> make a tremendous effort to maintain and strengthen.

### **Daytime activities and learning**

The daytime learning processes related to knowledge production and relevant to the use and conservation of biodiversity seem easier to pinpoint than those of the night, as most of the daytime processes are more directly related to concrete action.

In terms of diversity and sustainability, the high standard of quality of indigenous agricultural production has proven, to my knowledge, to be superior to any science-based production system (Descola 1994; Vélez and Vélez 1992). There is no doubt that a very detailed and flexible body of knowledge is required to maintain and develop it (Van der Hammen 1992). However, it was not easy for me as a white, male researcher to access in-depth reflections about why their knowledge works. Most often, I was met with remarks like, "I have always done like this"; or "my mother taught me the right way to do it, and it works for me"; or "it all depends on the hand, so you have to experiment to find the right way..." Therefore, the following account is less detailed than the section concerned with mainly male-dominated institutions.

When 16 women informants were asked individually to point out knowledgeable people and to indicate why they think they have become so, they stressed three qualities:

- First, personal drive, interest, will, and liking for the hard work in the *chagra*
- Second, the heritage from her mother and grandmother, especially if she was brought up in a *maloca*, celebrating traditional dances
- Third, the character of her grown-up position: Is she an assistant or owner of a dance?

Apart from particular individual qualities and gender, age, and kinship relations, there is a clear emphasis on the institutions of the *maloca* and the ritual dances. In

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<sup>65</sup> Knowledge production is driven by a number of motives, including material needs, pressing problems, the wish to understand certain phenomena and how they are related, and the wish to uphold, strengthen, or weaken social positions etc. In this, the people of the Araracuara region do not differ much from people in other places in the world.

the following, I discuss a few examples, which each in their way illuminate these dimensions of the most knowledgeable women.

*Maria Albertina and her daughter*

Maria Albertina is a good case of a local capacity with regard to agronomic and agro-ecological knowledge. What contributes enormously to the respect she is given, is the way she receives people in the *maloca*, especially during dances. She and her companion, Arturo, celebrate the Dance of Turtles, which concerns wild game. The guests bring meat, if possible, and unlike the Dance of Fruits, the guests are paid back in agricultural products, in addition to ritual substances and food.

Maria Albertina makes sure to give the guests a very diversified bundle of foods and spices, including several varieties of the culturally precious chilli peppers, peanuts, and various cassava breads and starch drinks. Naturally, as people say, the guests take seeds with them to try them out at home.

According to her daughter, Isabel,

*... she knows all the oraciones and she cures our hands before sowing. This cure makes the peanut plants she sows give until 23 peanut shells per plant, and all of them full. Others plants may give 4 or 5 peanuts and 2 or 3 of them full.*

*Oraciones* are ritual sentences, like short prayers, which are spoken while sowing or weeding etc. In each ritual sentence lies a message. This can be information of what to do to secure a good harvest, to avoid animals and insects eating the seed or plagues and diseases that harm the crop in other ways. Some of these ritual sentences are straightforward agronomic advice, while others give little meaning to an outsider. An example is that peach palm seeds should be sown during the daytime, when the owl sleeps. If not, the roots will develop to a size as small as the claws and feet of the owl. A plant pathologist or others might be able to find a scientific explanation for why the peach palm grows better this way and for some of the other messages. Or they may not. The point is that it works for some in the region, although not all. That is what they mean when they say, “*It depends on the hand*”. You have to try it out. When you find “*your way, you stick with it*”.

Isabel explained further the origin of her own and her mother’s knowledge.

*My mother draws on the heritage of my grandmother. My grandfather was a cacique and had a very large maloca. I had the opportunity to see how my grandmother used to sow. The same way as my mother does. I know how to sow like her. I have two chagras. To the first, we invited all my brothers and their friends to work. We prepared all the seed by variety, in piles. From there, you advise, ‘Don’t sow deep because the yuca (cassava) will turn out small then... And don’t sow next to tree trunks, because we won’t be able to*

*get the yuca out for the roots. ' It took two days of sowing among all of us. This year we sowed between the two of us, my mother and me, because it did not give good results when the others helped. We, on the contrary, search for and find all the soft spots in the ground. It took us 15 days, sowing every day.*

Isabel mentions the custom of curing or healing the hand before sowing. This is a cultural tradition, which to my knowledge is slipping away. Very few young women do it. When Isabel says that her mother heals their hands before sowing, she refers to a physical and spiritual act in which the Creator is called upon to help ensure abundance. I have only second hand information about this. More important, to my understanding, is everything that goes with the healing of hands – the advice, the sense of value given to agricultural practices etc. Women of the Clan of Worms told me about how their mother had received this special training, and that they had to follow all kinds of norms and restrictions. The old *Casique* Honorio, referred to them as follows:

*The most valued women were those who have had special training in sowing and cultivating. Everything she would touch would bring about abundance.*

However, not all agree about the benefits of relying on the good will of the Creator when it comes to something as important as their food supply.

#### *Ana*

Ana is young and has recently moved in with her companion. Therefore, she has only three 'proper' *chagras* (one *natik+pa+* for each year). Her mother-in-law, Isabel, has more than 25 *chagras*. Most of them are now *riare*, fruit plantations.

Ana still depends on her mother and mother-in-law for joint labour, access to most of the seeds in the sowing season, and advice concerning cultivation techniques etc. Last year, she was able to pass the 'seeds' or sticks of cassava from her own fields, something which gave her much pride, since it is a clear indication of her development towards independence and maturity. It will take some years, however, for her fruit trees to bear and provide enough seeds to pass on. She has had difficulties sowing the peach palms, although it seems to be going better already. Ana has made three trials up to now. She tested the preparation of the seed (washed or not) and also the way to sow (as seeds or as germinated sprouts).

One morning when I was allowed to help in the *chagra*, Ana's mother-in-law told her (she was also clearly addressing me):

*One must experiment to make sure always to have chagras and fruit plantations of abundance. Women who know how to experiment never fail. Having your hands conjured from childhood, you may obtain abundance in most crops you sow, but you run the risk that the spirit might get angry with you. This may happen if for example the chagra wins over you. In other words, if*

*the family doesn't manage to eat everything before they begin harvesting the new. From this moment, the woman might fail. This won't happen to the woman that experiments – she is her own.*

This very common example shows that women seek information from various sources, that some address problems with consciously experimental strategies, and not least, that historically they have had a more formalised learning system that forms specialists. A series of interviews with women in the area shows a clear tendency towards the necessity of experimenting in order to "search for the right way to cultivate".

### *Testing and experimenting as a cultural norm*

In the series of semi-structured conversational interviews I held with people from the two communities, all the women I talked with emphasised the importance of kinship and friendship-based networks to access, reflect, and verify knowledge. These networks meet according to daily, weekly, or seasonally determined situations, conversations occur, and/or inquiries are made. Some of the common situations mentioned are while walking to and from the *chagra*; while working in the *chagra*; while working and during pauses in the processing of foods; and while cooking food around the kitchen bonfire etc. Different representations of sociality, such as work or labour exchange relations, also turned out to be an indicator of the livelihood strategies. These work relations vary in degree of formality. My feeling is that the less related by kinship or friendship people are, the higher is the degree of formality. One of the more formalised types of labour exchange, or working parties, is referred to as *minga*.

### **Working parties: processes of communication, demonstration, and verification**

During fieldwork, I was struck by the many expressions of formalism and moral judgement that were made about those who, for some reason, promised more than they could fulfil. The ability to work hard and achieve a good and secure livelihood from one's work is the standard by which people and working relations are often measured.

Omar, a young Uitoto man, mentioned the ritual dialogue of work, the need for a reciprocal act involving *ambil*, if it is a major work of cultural relevance such as building a house or clearing a field in the forest. A plan of action is necessary. Text box 5.1 describes an example of such an event, which I experienced in Araracuara during December 1997:



*Text box 5.1: The dialogue of work – ritual, organisation, learning, and protection*

It was early morning in the beginning of the dry season. Bartolomé and his son, Belisario, were quietly eating their *casabe*. They were sitting at his cooking bonfire in the *maloca*. Belisario's four children were finishing their breakfast, and the two older boys were getting ready for school. Isaura and Juana were stirring the cassava starch drink, *caguana*, to have it ready. On the way out of the *maloca*, they all took their machetes, the pot with the drink, and two axes. They stopped by the fountain to sharpen the instruments, and then went into the forest. They had a good one-hour walk ahead to the plot, which they had identified the night before as the most suitable for the communal *chagra*.

On the way, they met with seven other couples with their smaller children, a few young unmarried men, and a number of widows. Belisario, as *gobernador* of the community council, had asked his father to organise the felling and his aunt Alcira to organise the cutting of bushes etc.

The night before, they had heard and discussed the ritual advice of caution. Although they all knew the proper way to swing an axe or a machete, and how to work hard, they had paid much attention to the subject in order to cool down this crucial moment of interaction with the spirit-owners of trees and bushes etc.

All bushes, small trees, and branches up to two meters high were cut and piled. Bartolomé indicated which of the bigger trees were to be left standing, and in which order and direction the rest were to be cut and laid down. The trees are all laid in the same direction to ensure future access by foot. The tall trees are cut down first so that they bring down smaller trees in the fall.

The rest, as they say, was pure work...; however, from my point of view, the remaining activities were not simply 'pure work'. They displayed a set of more or less intentional learning processes. Men and women gathered in small groups of three to six, often with a wide age span, and used the infrequent event to exchange their knowledge on plant names, uses, and particular botanical or ecological characteristics. But why would they encounter unusual or seldom found plants? This type of area would be frequented by most of them on a daily or weekly basis. Well, when moving around in the forest, several plants, animals, and insects are not visible, as they inhabit the remote tree canopies. Furthermore, the vast number of randomly selected trees to be chopped down provides a unique opportunity for comparison of characteristics. Three or four varieties of leaf shapes can be gathered in a second, and several woody climbers can be cut, smelled, and tasted to identify and explore medicinal value, drinkable fluids etc. This is also a good opportunity to teach children which insects and wild fruits etc. are poisonous.

On the way back, some of the men collected a small basket full of coca leaves for the nightly *mambeadero*, while others collected fruits from the treetops. While

drinking water from a stream, which ran through an old *rastrojo* (fruit plantation), Bartolomé showed his grandson several varieties of domesticated *canangucho*, indicating differences in size, colour, and leaf-shape.

After eating, the men met again in the *mambeadero*. The work of the day was assessed and remaining work planned. Everything went well – they had not cut themselves or been hit by a falling tree! They explained that this was because of the good organisation and the power of the spoken word. By this, they were referring to the understanding that none of the trees' spirit-owners had been offended, having been warned the night before. The Creator had been called upon and through the medium of *ambil*, the owners of wild plants and trees were warned: "Tomorrow we will clear more forest. Not out of evil will but for the sake of safety, development, and abundance..."

In the spoken narrative, the most common word embodies the concept of replacement. In the Muinane and Uitoto cosmivision, each plant is owned by a particular and often malevolent spirit. These spirits, which often take the shape of an animal, fish, or insect, are believed to be envious of the capabilities of humans. Cultivated species are plants that humans have successfully stolen from the animals by means of their wisdom, which is acquired through the use of ritual substances (primarily coca and tobacco). If the spirits are not appeased before the plants or trees are removed or in other ways used or destroyed, they will react unfavourably. These reactions may appear in the form of diseases that attack humans or plants. The 'owners' are appeased by ritual *mambeadero* words and by replacing the wild plants with cultivated relatives, both look-alikes and botanically related varieties.

Before describing the institutions and learning processes that primarily take place during the late evening and night, I will briefly summarise some of the most important learning processes that occur during the daytime. However, as we shall see, there are several overlaps.

#### *Daytime learning processes*

**To observe:** Most tacit knowledge is probably learned through the conscious and subconscious observation and copying of other people's actions, the results of actions, and any other phenomena.

**To inquire:** As I will return to in much more detail, the ability to and interest in asking precise questions is viewed locally as fundamental to good learning.

**To experiment:** The experiments are related to practice, that is, daytime activities. These are conscious acts of testing hypotheses by trying out information received on prior occasions: for example, when in the field with other people, having observed the results of other people's actions, hearsay, information given

within relations of trust, and not least, night-time dialogues and narratives. As I have heard over and over again: "*Information must dawn to become true knowledge*".

**To teach:** "*The particular thing about teaching is that it is given birth by the elder. The elder will talk as if reviewing pages.*" José Daniel Suarez (1996) compared the "*stock of knowledge*" to a thick book or a library.

*Walking with your father or another elder in the forest you see, listen and identify. In the mambadero, you tell stories and narrate. In the forest, you demonstrate in practice. One may ask questions about the plant that was narrated about. How is it? And the elder would answer, 'Now, we can go and look for it in the forest'. There, you don't narrate; there, you simply explain and you demonstrate – how do you get it home? How do you use it? ... (Mariano Suarez 1997).*

**To absorb:** "*Little by little without direction – one will eventually learn*" (Bartolomé Castro, 1997). This is seen as one among many ways to acquire knowledge. And it does not mean that knowledge is learned and accepted indiscriminately. People are very explicit concerning what they term 'the good knowledge', which eventually, with hard work and skills, should lead to what is commonly phrased as a situation of development and abundance.

**To store:** Remembrance techniques by way of mind maps and routines. One example, which is very relevant for knowledge on biodiversity, is the custom of 'marking'. All people, and especially those who have their daily walks in the forests, fallows, and fruit plantations, mark trees, plants, soil types etc. to create a sort of mental map. Therefore, people know where to go to find, for example, particular plant species. A woman compared this with our ability to shop. She had been to Bogotá and was astonished of our (i.e. non-indigenous people) ability to walk into any supermarket and, within seconds, find just what we need. An often-heard phrase exemplifies the explicit use of such mind maps: "*Now where do I have this palm... Oh yes...*".

Basically, these learning processes do not differ from those that can be expected from any rural setting. However, the women indicated that the most knowledgeable among them are those who participate actively in the cultural institutions, prepare for and celebrate dances etc. Is this simply because they have to be good farmers, due to the fact that the periodic demand for food production to celebrate the dance rituals is immense? Or is it related to the knowledge developed and reflected upon during the course of the dance study. This is difficult to answer in exact terms, as this study does not try to measure the effect of the particular cultural guidelines on sowing etc. The importance of the cultural institutions and learning processes for the maintenance and communication of knowledge on biodiversity and also for the diversity under conservation are analysed later in this chapter.

Several of the most important daytime activities are related to the production of food. As one of the women's main responsibilities is to ensure short-term and long-term food security, I have primarily focused on women's knowledge on production in this section. This is not to say that men do not know about food production. They do. They often work with the women in the field, and it is a frequent subject in the *mambeadero*.

In text box 5.2, I give an example of how daytime and night-time routine- and research-like activities and knowledge processes are tied together. The example relates to recent advances in Muinane medical knowledge and demonstrates what to many may seem to be an accidental discovery while performing a routine activity, but this routine catalyses a set of well-established research-like cultural practices and knowledge processes.

To introduce this example, a brief explanation is necessary concerning a key element of the world view and everyday practice among The People of the Centre of the World, who consider themselves the people of coca and tobacco.

For the Uitotos, tobacco is the daughter of the mother of creation. She is the mother of wisdom and 'science'. Their concept of science has been explained to me as the 'ways to achieve wisdom'. For the Muinane, tobacco is the Creator, and it is through him that one will learn. The tobacco is boiled for many hours and blended to a black liquid with a plant slobber. To consume the tobacco liquid, it is usually mixed with vegetable salt extracted from a wide variety of plants, mainly palms. These trees, palms, and other plants are gathered and burned. The salt is washed from the ashes and dries out in a pot over a fire. The final product is called *ambil*. On one level one can compare *ambil* and money.

*Ambil* is used daily, but also on special occasions, to ask for help to do a job, such as the construction of a house or a communal house (*maloca*). It is also used to request advice and to prepare for a traditional festival. Accepting and using *ambil* commits all parties involved (deliverer and recipient) in front of the creator.

*Text box 5.2: The salt of life - discovery, testing and validation of a new drug*

In this example, Chucho finds a possible source of salt. As mentioned above, this represents a high potential value, both for personal consumption, and in his relations with the people of the region.

During the annual burning of the slashed forest plots in 1997, a tree burned completely and the ashes looked like brown sugar. This is quite uncommon and indicates a possible source of salt. Chucho tasted it with his tongue and felt the presence of salt. He filtered it with water, dried it with fire, and mixed it with the liquid tobacco. From that day, he began to lick it.

Every day a worm, "drunk with *ambil*", came out of his mouth. After three days, Chucho showed the worms to his wife, who in terror and disgust responded, "You

*are no longer human, you are an animal*". This filled him with anxiety. So he took his bottle of *ambil* and paddled upstream to see the *Casique* to tell about his experience. He sat down in the *mambeadero* circle of the *Cacique's maloca* and after talking for a long while about general issues, he started telling about the *ambil*, the worms, and his wife's disapproval. After hearing him out, the old man responded: "*It seems like a very good remedy you have discovered. Let me cure myself, too*". And he licked from the bottle.

The *Casique* began a historical investigation.<sup>66</sup> After some time, he arrived at the conclusion that the recently discovered remedy has its own place in history and a name of its own.

Chucho felt much better now that the matter was cooled down. He took pride in his discovery and amused himself with having another good tale to tell in the *mambeadero*. The new knowledge, which was new to them but not to the Creator, was established as a fact by the authority. Chucho could no longer be classified as belonging to the 'animal kingdom', and on top of having become the proprietor and source of a large amount of salt/drug (with comparatively little work), he had also gained respect from the *Cacique* and his kinsmen. This was certainly a good week for Chucho.

The example of Chucho and the worm serves to highlight how the production and reproduction of medicinal knowledge, as within other domains, consists of social processes such as experimenting, observing, contesting, communicating, evaluating, validating etc. The composition and relevance of each of these processes vary with location, including the social, cultural, and natural conditions, situations, and relations.

In the following section, I focus on the knowledge processes that commonly occur after sundown.

### **Night-time activities**

#### **Learning and organisation of knowledges within the *mambeadero* and the dance institutions**

*The principal research process – the art of focusing and making precise inquiries*

One of the most essential and most often stressed ways to acquire 'good' knowledge is the idea that knowledge is best received when learning is motivated by personal interest. This interest can be stimulated, of course, but must come from

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<sup>66</sup> In his basket, which is the symbol of the container meant to store knowledge. Anatomically, it corresponds to the thorax or sometimes the heart.

the person. The drive is often an urgent need to do or to understand something. People stress that the best learning result is achieved if the question is asked while the problem is really acute, as “*the person is preoccupied and anxious to know*” (Vicente Makuritofe 1996).

Within the *mambeadero*, there are at least four forms of inquiry:

The **first** and most serious and demanding form is “*asking with ambil*”. Salt is extracted for the occasion, a long and tedious process, and then mixed with the precious tobacco liquid. In this way, they demonstrate a serious attitude and address their question both to a person, who is often a *maloca* owner, and to the Creator through the medium of *ambil*. They explain that it is a way to inform the Lord. If the elder accepts the *ambil*, then he is culturally obliged to tell “*all he knows*” on the subject. As the old *Casique* of Chukik+ told me:

*When a young man brings ambil and coca, you receive it and you leave it in the mambeadero. Then, you alert the Creator so that the mind of the anciano is opened. Then he can teach the youngster. The Lord descends to have a look at the ambil and the youngster – to see if he is serious, or if he has come to bother an old man (Honorio Mukutuy, June 1997).*

The **second** and more common type of night-time inquiry is asking a question during an on-going dialogue or narrative. *Ambil* is not required when the dialogue has already been initiated. The answer will be brief and certainly less detailed than if asking with *ambil*.

A **third** and very different type of question, which I will explore in more detail when analysing the cultural educational institution of the *dances*, are the riddles made to test the knowledge of the *maloca* owner and his assistants during the Dance of Fruits.

A **fourth** form of inquiry is asking a friend, a so-called *mambeadero*-mate, for clarification etc.

An example of inquiry came up during a conversational interview with Omar, a young man of 20. Omar explained that he started frequenting the *mambeadero* four years back, when he experienced a family health problem, which he did not know how to handle. He visited his uncle, who was sitting in the *mambeadero* of his *maloca*, and asked him to tell him about diarrhoea. Omar experienced that his question was not precise enough, because his uncle went on and on, circling around the issue but never really reaching the concrete answer he was looking for.

*You have to know how to ask. This is what I have studied, how to ask. You can ask during daytime and may expect a straightforward answer or nothing at all. At night, you can ask culturally with ambil. If I had asked Aurelio, “How do you cure diarrhoea?” then he would probably have answered, “Try to use this or that plant”. If I had asked, “How is the conjuration of diarrhoea?” and given him ambil, he would have told me that from history.*

*He would include knowledge of why some plants have a curing or a negative effect, what the reasons are for diarrhoea, how to cure it, and what to do if it doesn't work. If the question is very wide or loosely formulated, it may take every night for three months. This happened to me once, and if you don't sit through this, the anciano will lose his respect for you (Omar Castro, April 1997).*

So Omar learned to appreciate the recommendation to think before asking. Again, we see the cultural emphasis on viewing learning as a process.

#### What to ask about – “stick to your path”

In Muinane and Uitoto methodology, they are very preoccupied with delimiting the study focus. They apply this to their own searches for knowledge, both within formalised inquiries, riddle cracking, and cultural careers, and in their daily experimentation. They also extend these methodological notions to non-indigenous people's studies. My own research is an example of this. When I first arrived in the region, I visited a number of local and regional authorities to present my project plans in my search for research locations, partners, and permits. As the subject of knowledge of biodiversity is a delicate matter internationally, nationally, and regionally (see chapter one), part of the dialogue concerned who I was as a person, and who I was representing. However, another issue was just as important to them, the issue of methodology, or as they often say, path. They were very consistent in asking me how I was delimiting my research: spatially (the forest, the *rastrojos*, or the *chagras*), temporally, and socially (who and how and when I intended to inquire). I was often advised what to do, and once I was accepted as a researcher, I had the privilege of having appointed a ‘process-guide’, Aurelio Suarez. He undertook a role which is in some degree similar to the process authority who functions in their own system of higher education, the ritual careers celebrated with traditional dances. I will return to this shortly.

Chucho, like other *ancianos* and *maloca* owners, was very clear concerning the personal characteristics of a good inquirer:

*When you wish to inquire, your attitude is very important for the success of the situation. You have to be focused and cool (s+cui) and think of nothing else, so that you get the whole story. You have to trust and have faith in the maloca owner to whom you are addressing your question. When the maloca owner is advised about the inquiry in good time to prepare himself, this will be the only subject that will be dealt with during the mambeadero, between you and the maloca owner. The rest will just be listening (Jesús “Chucho” Ortiz 1997).*

The old *Casique* of Chukik+ supplemented Chucho's words, although on another occasion. He introduced

*... the wish to specialise, as for example, a medical doctor. Then, you make questions concerning this subject and nothing else. This, however, is a long study period, until the master gives him the final test of the whole body from feet to hair – all the diseases they can meet. It's like you are studying one thing only. And then you teach it (Honorio Mukutuy 1996).*

#### Who to ask

Ideally, the knowledge system is patrilinear and patrilocal, which means that the son stays with his father and builds his residence near him, if they do not live in the *maloca*, which few do these days. Therefore, the natural person to ask is the father. However, this is often not the case for various reasons: First of all, not all sons get along with their fathers; second, many fathers do not live, or have not lived during their youth, the cultural lifestyle required to be able to answer.<sup>67</sup> Often, young men find it easier to ask their uncles, as the father-son relationship is affected by the burden of expectations etc.

In the case of the Castro family, Bartolomé's sons, Omar and Belisario, have grown accustomed to asking their maternal uncles, Aurelio and Mariano, who are considered cultural traditionalists and who live in *malocas*.<sup>68</sup> Bartolomé has always followed the indigenous production techniques etc. on a practical level, but seems timid when it comes to teaching the ritual discourse. He worked for 15 years with the national research institute, Corporación Araracuara, and according to his son, Omar, he has pushed the family in the 'white' direction. As Bartolomé told me, "*I never thought they would be interested in tradition*" (referring to his sons).

Gustavo and his father, Arturo, for example, from the Clan of Worms, Chukik+, have difficulties establishing a dialogue in the *maloca* of Arturo. According to Arturo's cousin, Chucho, who is not entirely unbiased

*... Gustavo may say to his father, Arturo, 'Last night you advised me on this subject – and you told me well, so today I ask you, where do we continue?' From there, Arturo may proceed on a wrong path full of barricades and filth. A man like Gustavo, half mature, half green, who still hasn't received his father's basket [his wisdom], will have difficulty moving and settling on his own and has to find other ways to fill the gaps, so that he can live the sweet life. So he visits his uncles, here and downstream. The uncles will ask,*

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<sup>67</sup> This relates to social change and other reasons for the presence of different livelihood strategies (see also chapter four).

<sup>68</sup> Mariano lives in a full-size, four pillared *maloca* in Chukik+. Aurelio, his younger brother, lives in a smaller, not official type of *maloca*, i.e. not meant for celebrating a ritual career with dances etc.



*'What's on your mind?' and he would say, 'I never asked my father about this and that, which I need to know.' So the uncles would let him know little by little, and the nephew would say, 'Until here – now I have enough to start. In a month or two, I will return to ask with ambil. Then I know how to ask well'. The uncle would then ask for a summary, and if the nephew were able to do that, the uncle would accept, saying, 'This is now in your basket'. However, if he cannot sum up the content of the evening, the uncle will tell him that he was distracted and further inquiry would then be more difficult, and subject to negotiation (Jesús Ortiz 1997).*

Apart from issues of morality regarding 'proper behaviour', the example explains the positive aspects of the uncle-nephew relationship. I have many examples of such relationships (Omar and Aurelio, Belisario and Mariano etc.). Lucho Sueroke, who is one of the indigenous teachers at the boarding school, also refers to his job as being an 'uncle'.

The cultural emphasis on focused inquiry, processual learning, and also the experimental nature of many daytime activities are what I see as the most central processes for keeping and developing the knowledge system. They open the system and provide for rather smooth contact with modern bodies of knowledge. Through such processes, non-cultural information becomes moderated and accepted or discarded.

Apart from the research process of precise inquiry described above, and corresponding procedures and relations, there are a number of other research processes. I will outline the most central ones.

#### *Other mambeadero research processes*

The second form of night-time learning process is top-down education in which a person who considers himself or herself to be knowledgeable in a particular field takes the initiative to inform another person by telling and/or demonstrating. According to people in the region, this form of knowledge acquisition is less effective than direct inquiry. Much of the information is not received at all, or at least not in the way it was intended. This form of knowledge transmission is seen everywhere within all kinds of social relations and situations. Therefore, it is also seen in the cultural institutions like the *mambeadero*, where it is systematised as a formal learning procedure. In the *mambeadero*, there are two important, formalised, 'top-down' procedures: the 'narratives' and the 'dialogues'.

The *ritual narratives* can be understood as the theoretical foundation or framework for understanding everyday phenomena. They are spoken by a cultural authority, often the owner of the *maloca*, the traditional counsellor of the community, or a specialist within a particular domain brought in from another *maloca* or community. These specialists are most often related to the owners of

the *maloca* through kinship ties. It is one-way communication that often deals with current problems of illness or unrest, or is specifically directed toward appeasing (cooling) certain spirits<sup>69</sup> of crops etc. before particular activities, such as large communal work. The narrator is often accompanied by a 'yes-sayer'.

The *ritual dialogue* is the analytical forum in which particular past, present, and mostly immediate future aspects, needs, and problems are dealt with. Two or more people are actively involved, often two *ancianos*, while the others present at the *mambeadero* listen and ask questions.

Storage and remembrance techniques often take the form of songs, narratives, and routines. Within these techniques of learning or "*evacuating knowledge from the Creator*", there are several variants, some depending upon person and gender. Jose Daniel, the young community leader from Chukik+, explained that the different types of knowledge are 'evacuated' at different planned or accidental moments (in time and space) that are spread over annual cycles and life cycles. These moments may arise from particular needs or constraints, or "*one may simply find oneself in one of these moments: for example, the necessary knowledge to build a maloca; make a baile; cure a disease; go hunting or fishing etc.*" (José Daniel Suarez 1996). Planned moments often correspond to some cultural institution.

### Specialists and generalists

As an example to give a general description of a *mambeador*,<sup>70</sup> I introduce here a young Uitoto man and his ideas of how 'the good life' can be achieved. He sets out some cultural guidelines for conviviality, which give some idea about the salience and maintenance of institutions and levels of organisation such as the household, the *mambeadero*, the relationship between man and woman, and how communal work is organised. He acknowledges, however, that these guidelines are not followed by the majority of youth in Araracuara (but more in Chukik+). They do not have the patience to participate in the *mambeadero* sessions or are afraid of being laughed at by the elders for their lack of knowledge or discipline.

Many men seem to come to the *mambeadero* simply to meet their friends and share experiences and the ritual substances of *mambe* and *ambil*, but some have developed a rather detailed framework for the kind of knowledge they pursue. Omar, the younger brother of Belisario and son of Bartolomé, says he has. When I asked Omar what he considers to be his path and field of inquiry, he said that he

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<sup>69</sup> In the Muinane and the Uitoto cosmological construct, hostile non-human agents inhabit the world. These are often referred to as 'owners' of a particular plant or animal or as spirits.

<sup>70</sup> A participant in the *mambeadero*, a man who uses *mambe*, the coca powder that is a requisite for a 'proper' man.

wishes to study knowledge of “*the humane life*”. He informed me that his study has not formally started yet, but that he spends a lot of time trying to understand what the field covers, so that he will have an overview before starting. He explained that if he does not attend the *mambeadero* for a couple of nights because he has gone hunting or to bed early, he feels as if he has lost weeks of learning.

When I asked him what he had found out so far in terms of delimiting his field of inquiry, he answered:

*My study could be termed... health in the family, and how a man must deal with the whims and the rage of the woman. Some have a bunch of children immediately after getting together, because they don't know how to deal with the woman. This lesson cost me many long nights, three months sitting with my father.*

*My theme is the unification of the household. This is the first and foremost level of unification. If this union is 'well seated', the community cannot be overturned [destroyed]. It's like a custom, an indigenous people's custom. However, it is very little appreciated by the young nowadays – we have little interest. Sometimes I ask a question during the *mambeadero* – sometimes I don't. Sometimes it's like they, the *ancianos* [old men] test you, which gives you a sense of laziness – unwillingness to get involved. Like my younger brother, Dagoberto [15 years old]. He has reached the point where he can enter this dialogue, this study, to receive all this knowledge, so that he will be prepared once he finds a woman. You need to know how to conjure and the necessary advice to live the good life. Conjuring means curing with air blown from the mouth. It is not visible. The purpose of conjuration in this field is to turn the woman towards work and not towards 'hanging around' and 'madness'. First, one must sweeten the heart. One must calm all this heat and cool the environment. This is how it works. Continuously, because if not, she may turn again. But as one deals with the situation using *ambil* and conjures, one will become aware of any changes (Omar Castro 1996).*

Omar finished his statement by saying that if “people follow these words, their lives will turn out well”. However, he says, “One has to act and respond to everything that happens. The fundamental principle is that you should never retreat or give up while you are in problems” (Omar Castro 1996).

*Text box 5.3: Omar's study, in his own words*

1. *“The women. The first point is to distinguish the two women. One is tobacco, the other is the woman [he didn't say wife or companion which is what he meant]. From there, there are two more women: The false woman (Jabor+na) and the prostitute. Jabor+na whispered lies into the ears of the Almighty. He knew they were lies, but said nothing. You have to know the bad to know the good. After that came tobacco, the true woman. This point is very long, and it took me many nights of dialogue.*”

2. *After this, you receive both women in one. In pure words of conjuration, the Creator says, "Your daughter has your heart,"<sup>71</sup> but she also has mine – she is one", and so she gets her name. "In this house, in this maloca, in this land, I receive her. I seat her." But I have to do it with something. We have to give her something, sweet ambil or the sweet manicuera.<sup>72</sup> "In this sweet land where there are no problems."*
3. *Then she is turned to work. Naturally, this will not do the job alone. The surroundings always disturb. But well seated you are not pushed over. This is the content of the conjuration. But the 'scientific words' are very difficult. With words of tobacco, He will understand. The differences between scientific and common words are that the Creator hears them all, but you can make Him pay special attention by using scientific words. They come as long lists of names, and it is difficult to do it well. The ancianos will not teach you. Only if you ask them with ambil, they will. Nowadays, very few will do this. You have to prepare coca, stay up long nights, and it doesn't pay [in money].*
4. *Seating the house. A procedure to harden the wood and to silence the termites.*
5. *The dialogue of work. Like the seating of the house, the dialogue of work is held between the owner, a sparring partner, and maybe an assistant. You have to make ambil and hand it over. They in turn hand over to you the house (they help to build it). My plan is to just make a little ambil, just enough to carry the pillars and such, nothing else. According to such ideas, one develops a plan so that people will not refuse to work. The owner has to bring food, thrice a day. You pay the sparring partner in ambil, and he decides how he will pay back. That is his problem. No one will reject the person, the owner, who pays in ambil, as the work belongs to her [ambil] and no one may reject her – this is serious stuff – not a game.*
6. *The dialogue of seating. The house of the 'white man' is rejected as unsuitable. In here [we sit in the Castro family's wooden house on poles, outside the maloca], a crowd of noisy people enters. A party, a drunkard. This is not how it should be in a maloca. The house of the white man was the first house of the Creator. With a wooden floor on poles. It was rejected because it doesn't fit the life of indigenous people. "Then the Creator sat down on the ground, and He sat firmly. He sat well. This is how it should be." I think that the house on poles is only for sleeping, so that the kids don't get their school uniforms dirty. The maloca is for working, for the family, for conjuring, for resting. For all this.*
7. *The Breath. You breathe [by prolonged blowing on a part of the body] – to consecrate, to put it in Christian words. The ancianos do it to become aware of whichever problem, from whichever spirit. So that all evil is rejected. Therefore, due to their capabilities, the ancianos cannot easily be pushed aside.*

<sup>71</sup> According to the Muinane and Uitoto, the mind is situated in the heart.

<sup>72</sup> Sweet yuca drink used to reconcile conflicts.

## *Bodies of knowledge*

The instructions or cultural guidelines for how to pursue the good life were also the subject of conversations and interviews I held with several informants, especially elders such as the Muinane elder, Mariano Suarez. The subject is further elaborated upon in narratives by the Uitoto elder, Hipólito Candre in his book, "Cool Tobacco, Sweet Coca" (Candre 1996/1993), transcribed and commented by Colombian anthropologist, Juan Alvaro Echeverri, in Echeverri's dissertation from 1997, and in writings by another Colombian anthropologist, Londoño-Sulkin (2000).

From these sources, we may conclude that the people of the centre organise their ritualised knowledge into a number of cultural discourses. The authors refer to them as words. These words address ethical issues on the rules of proper behaviour and elaborate on major themes of identity, such as the boundaries of culture, the relationship between culture and nature, the explanation of illnesses, the interpretation of dreams. Based on and in continuous dialogue with these discourses are a number of cross-cutting studies of specialisation, referred to as dances. Before I present these studies and a detailed analysis of one of them, I will present a brief description of the most important words, as these may contribute to the understanding of the cultural construct behind the processes of learning. For readers interested in a textual analysis of these discourses, I recommend the work of Candre and Echeverri.

The Muinane, closely related culturally to the Uitoto, organise their cultural construct in four major discourses, supplemented by other discourses of which I have gathered four.

The major discourses are known as:

- The word of advice, which makes one respect and be respected, *Fagoj+*.
- The word of coolness, serenity, calmness, slowness, and thought, *S++kujiy+*, meant for cooling down 'heated matters', such as past, present and potential conflicts.
- The word of healing, *Temuij+*.
- The word of dances, *Imojiy+* (Mariano Suarez 1997).

*Fagoj+* is the word of advice and is a set of rules and recommendations for good behaviour, which are also instructions for how to learn and how to endure times and situations of hardship, like working in the *chagra* in the midday sun etc.

*S++kujiy+* expresses a sense of sweetness, and a state of calmness and purity.

*Its like the few crystals of vegetable salt extracted from the dirty palms full of spines. You work hard collecting large amounts of palms in the forest. Then you burn it, but only the wood burns not the salt. After filtering the ashes with water and boiling the water dry, you can finally blend the*

*handful of salt with tobacco fluid. Trying the ambíl brings you to a state of s+kuij+. It cools your body.*

*The woman is the product of, and is rooted in s+kuij+, and is cooler than the man, who is rooted in the coca – which gives ground for more rage (Mariano Suarez 1996).*

**Temuij+** concerns the conjurors and requires intimate knowledge of spiritual narratives. Likewise, a detailed knowledge of herbs is necessary to complement the conjuror's effect in curing a patient.

*Temuij+ is joined by S+kuij+ me because a cooling down of the disease is necessary to reach successful healing. If we were to list the sub-categories we could easily fill two notebooks (Mariano Suarez 1996).*

**Imojij+** is to celebrate and to demonstrate

*... the suffering and hard work of maybe 10-15 years of studies. Now, it is time for demonstrating, for putting the knowledge to use. This is the point of graduation. To sing and seal the long period of studying, the boy thus evolves into a teacher. The course hereby ends (Jorge Ortíz 1997).*

These discourses are supplemented by other discourses, including:

- The word of protection, esteem, love for things and kin, and respect for other people's love for their own people, **Kávaji**.
- The word of conception, fecundity, and creation of life, **Fíivojij+**
- The word of work, **Dúd+kamajij+**
- The word of abundance, **Gaúbagajij+**

The structure of the Uitoto cultural construct, *Rafue*, or the Uitoto, includes:

- The word of tobacco
- The word of strength
- The word of discipline
- The word of cooling down
- The word of the harvesting mother
- The word of the harvesting father (Candre 1996).

Summarising this section, we can conclude that the Muinane and the Uitoto have developed a detailed framework for learning and organising different bodies of knowledge. The explicit focus on a problem-oriented and process-oriented approach underscores with unique clarity the complex ties between knowledge production and culture. This was displayed during the specific daytime and nighttime activities and especially in Aurelio's statement of the importance of strength-

ening the capacity to solve problems through rigorous learning of cultural research methodologies.

## **Institutionalising knowledge production - the case of a dance ritual**

In this section, I analyse the character and importance of the institutions and practices in which the above processes seem to be embedded.

### **The dances of the People of the Centre of the World**

As a most relevant case, I focus here on the cultural institutions referred to as the dances (or the festivals, Echeverri 1997) of the People of the Centre of the World,<sup>73</sup> and show how they are salient and dynamic features of cultural learning systems. First, I present the general character, the means, and the objectives of the dances in a historical and present perspective. Then, I turn to an analysis of the importance of the institution for the maintenance of knowledge on biodiversity, and for the conservation and use of culturally important plant diversity.

The festivals have proved to be historically resilient to the impact of modernity and provide a space or platform for people to access germ plasm and knowledge vital for the reproduction of local livelihood.

A dance is a forward-looking celebration of abundance aimed at dealing with or 'cooling down' concrete and potential problems. When dealing with serious problems, an owner of a *maloca* who has graduated from a dance study may decide to arrange a dance, thus employing the knowledge covered by his specialisation. Celebrating a dance requires an abundance of food and labour, since social status depends upon the quantity and variety of food that the hosts can provide. Therefore, the owners (both man and woman) of a dance will always sow large quantities of diverse food crops, spices, coca, and tobacco. Also, enough cassava of the relevant varieties to feed several hundred guests has to be planted up to two years in advance of the dance.

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<sup>73</sup> The idiom, the People of the Centre of the World, comprises seven ethno-linguistic groups of the northwestern Amazon: the Witoto linguistic family (Uitoto, Ocaina and Nonuya), the Bora linguistic family (Bora, Miraña and Muinane), plus a language isolate (Andoque). See Echeverri (1997) for an analysis of the idiom as a dialogical reflection of the history of contact.

Dances quite similar to the one described here are held in *malocas* among many indigenous groups all over the northwestern Amazon (C. Hugh-Jones 1979; S. Hugh-Jones 1979; Reichel Dollmatoff 1996; Echeverri 1997; Van der Hammen 1992; Schultes and Raffauff 1992; Århem 1998). Although it has not been possible to verify that other groups employ as developed ways of gathering and conserving plant genetic material, there are many accounts of complex and mutually committing networks and rituals of exchange of plants and knowledge.

### **Character, means, and objectives to protect community health**

#### *The four 'departments' of the 'university' of the People of Centre of the World*

A festival is a study and a discipline taken on by a residential unit, the *maloca*. The study is composed of a series of dances, each dance celebrating and examining a certain knowledge domain. The study period is usually 5-10 years. After the final graduation, the couple in charge of the *maloca* become 'masters' or 'owners' of the studied festival. The four festivals currently celebrated and the key knowledge domains<sup>74</sup> associated with them are:

- Dances of Fruits of the Earth - edible plants - health, social stability
- Dances of Turtles - co-existence with fauna - conflict resolution
- Dances of Trees - co-existence with wild flora - conflict resolution
- Dances of Wild Game - co-existence with fauna - hunting - nocturnal life

During the last century, the Uitoto apparently celebrated six different types of festivals,<sup>75</sup> while fieldwork from 1914 by the German ethnographer, Konrad Theodor Preuss, who worked with another Uitoto group 400 km upstream from Araracuara, indicates that by the turn of this century, this number was reduced to four dances (1994a). Since then, the knowledge taught has been modified, but the structure of the dances has remained. The main purpose of celebrating the festival of the fruits of the earth has been and is safeguarding community health, and as

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<sup>74</sup> The festivals vary in content and form among the different ethnic groups constituting the People of the Centre, but there seems to be an interesting process of developing a public discourse by downplaying or "secret-labelling" ethnic differences.

<sup>75</sup> Preuss (1994a) relates that the Uitoto were celebrating the following festivals at the time: The *ok+ma* (the festival of cassava and our ancestors); the *unik+* (the festival of fruits); the *yadiko* (dance of a tree); the *juare+* (the feast for preparing *maguaré* (jungle drum)); *eeiaño* (the dance of weeping); *bai* (the festival celebrated after having engaged in cannibalism); *meni* (the festival of stealing souls); and *raifua* (the festival of the dead).



Preuss writes, "*achieving abundant harvests of fruits in the future*" (1994a). The institutional set-up of this dance, which is different from the other festivals in several ways, meets the objective by means of two instruments:

1. To strengthen and conserve functional **biological diversity** by creating a **regional seed bank**
2. To strengthen related **cultural knowledge systems** by educating specialists and transmitting knowledge broadly.

The study is composed of at least five dances. Each dance covers a particular knowledge domain and specific plants. The first dance of the festival is concerned with the wild edible and poisonous plants, discovering diseases, rejecting plants and giving examples of the domestication of crops. The examples are historic but the techniques are relevant to the present day. The following dances focus first on wild but cultivated, and later on fully domesticated food plants. These concern, among other things, the management of crops – in other words, agro-ecological knowledge concerning pest management etc.

#### *Character and types of knowledge treated in the Dances of the Fruits of the Earth*

For each of the dances, one or several important plants are studied. The curriculum covers ecological, taxonomic, agronomic, and spiritual knowledge of all edible plants, from wild, over the wild but cultivated to domesticated plant species. As all the assistants know the theme of the coming event, the ecological, taxonomic, agronomic, and spiritual dimensions of the theme become natural entry points of most conversations during these two weeks. The participants may already know most of the information transmitted during the preparations by means of other learning processes from other institutions (such as the *mambeadero*, the household, communal work etc.). However, since they must pass something similar to an exam, they must go over large parts of the syllabus. During the dances I attended, the preparations were initiated a fortnight before the dance was opened.

The activities and the manner in which the subject is discussed are clearly divided according to night and day. During the daytime, everyone works hard in small and large groups to harvest, process, and prepare the food, and to some extent the ritual substances. These hours are used for informal consultations, playing with words, and testing the teachings of the night before. During the daytime, you draw upon the well-established relations of friendship, work mates etc., where trust and understanding are well established. During the night-time, the learning processes fall into a more formal structure, at least in the male circle of *mambeadores* in the centre of the *maloca*, the *mambeadero*. During the first few hours, the events of the day are evaluated in relation to the intentions of the night before. Then, the

programme for the following day is discussed and agreed upon. The next three hours are dedicated to narratives of ritual dialogue, *rafue*.

The narratives are usually undertaken by the advisor or by one of the community's traditional counsellors, accompanied by a 'what-sayer'. Meanwhile, the other men present (the women and children usually lie in their hammocks, sleeping or listening) are seated listening or quietly discussing doubts or clarifying issues with a *mambeadero* mate. One person is toasting and mortaring the coca leaves.<sup>76</sup> He blends the coca dust with the ashes of *yarumo* leaves<sup>77</sup> in a cloth bag and hands it to another *mambeador*, who shakes the bag inside a container, producing a very fine dust, called *mambe*. The *mambe* is ingested through the digestive and mouth tissues. The pause in the dialogue produced by the narrator moisturising his *mambe* with saliva is often used by one of the *mambeadores* to ask questions related to the dialogue. The *mambeadores* look upon this favourably as one of the central notions of learning: "Good knowledge grows out of the person's own desire/need to know." Usually, the night session stops around midnight, but as the time for the dance approaches, the sessions intensify and last several hours longer.

Four days before the event, the elders are called upon for advice concerning the formalities of the invitation, and then the *ambil* is prepared,<sup>78</sup> after which a religious sermon is held over the *ambil*.<sup>79</sup> The *ambil* is then sent out to the riddlers' *malocas* in their respective communities. They are awaiting it and with it, specific instructions. The *ambil* commits<sup>80</sup> the recipient to fulfil a task. By receiving the *ambil*, the riddler is committed to prepare and rehearse the songs and riddles according to the instructions arriving with the *ambil*. They explain the kind of dance being prepared, the kinds of plants to be focused upon and asked for, and the date and time when each ethnic group must enter the *maloca*. Each riddler will then distribute the *ambil* and the instructions to the many guests in his group. The *ambil* commits the guests to bring their best or most rare seeds and fruits of the kinds specified by the host and to participate in the songs and dances.

From this moment on, the dance is officially opened, and the host couple is not supposed to leave the *maloca* until the dance is over, four-five days later. Anyone may enter the *maloca* to check that the preparations are made according to the cultural norms. This is a kind of test of the hosts' organisational skills, capacity to

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<sup>76</sup> *Erithroxylum coca* L.

<sup>77</sup> *Cecropia* sp.

<sup>78</sup> By mixing the liquid tobacco (*Nicotiana tabacum* L.) with vegetable salt.

<sup>79</sup> *Ambil* is the symbol of the Creator and of the ability to learn and is used to pay for certain tasks, such as counselling, labour etc.

<sup>80</sup> Both a religious commitment, as tobacco symbolises the Creator, and a social commitment related to pride in available crops etc.

solve problems, and ability to store and remember information learned during the daytime experiences in the forest and the *chagra* and during night-time sessions in the *mambeadero*. The personal trait of being able to demonstrate calmness in stressful situations is seen as vital for the success of the event, and is valued highly in the post-event evaluation.

In the dances for which I attended both the preparatory phases and the dance ritual, the hosts, the assistants, and the advisor made a plan for the study during the remaining nights. Small groups were formed to concentrate on particular sub-domains. As they had invited two ethno-linguistic groups, the Uitoto and the Muinane, with a riddler for each group, they made sure that the small groups had bilinguals among them. On one occasion, they made smaller groups for each language.

The last day and night before the dance, the male host and his male assistants abstain from sleep and solid food. They explained that this is done so that they do not lose the 'fingertip knowledge' they had learned and to appease and control the spirits. The need for and the ability to master and remember the detailed ecological, taxonomic, and spiritual fingertip knowledge can be compared to the stressful and intense moments of a modern academic exam.

### *The riddles*

The riddlers make songs containing riddles that concern different aspects of the plants that their ethno-linguistic group will bring to the dance. Each of the riddlers then rehearses the songs with his group and encourages the members to bring as wide a variety as possible of the best seeds and fruits they have. Nowadays, the answer to a riddle is a tiny piece of information related to the vast knowledge about each crop. Preuss mentions that in 1911 the guests arrived

*... with all kinds of fruits from trees and plants, and even roots [tubers] like cassava, ñame, [and also] peanuts. ... They interrogate the owner of the festival concerning the origin of each of the trees or plants bearing the fruit given (1994a).*

He quotes a Uitoto elder for the following account:

*And so arrive another group. They bring fruits from the tree ruzuma and ask for its origin. The owner of the feast explains what is asked in the song, from the beginning (of the historical ritual dialogue) and narrates, he alone, the corresponding history. So we all talk about the origin of the tree ruzuma. Everyone is pleased and drinking caguana. The chief gives his allied caguana. During the night he deciphers the songs. Without leaving out any detail he narrates our history from the beginning. When he has deciphered a song, the questions are suspended. And so arrive another group to the game of the ball and their song are deciphered telling our history from the*

*beginning. The chief explains all details so that the riddle is not left uncracked (1994b).*<sup>81</sup>

Preuss was puzzled and impressed by the ability of the owner to answer the many riddles, and wondered how he could possibly know the complete narrative of each of the plants offered or inquired about. His hypothesis was that several riddles are covered by one narration. It seems that the procedure has changed since the time of Preuss. Nowadays, the inquiry is not so much aimed at eliciting an entire ritual narrative. The objective seems rather to test the capacity and the eagerness of the students (owners and assistants) to draw upon the studied knowledge from both ritual narratives and contemporary livelihood and to finally arrive at the answer to the riddle. The answer may be the name of a plant, an agro-ecological technique, or the indication of a crucial moment in time for a particular action.

Aurelio Suarez, the traditional counsellor for the *maloca* of Araracuara, pointed out the cultural space they had opened by initiating the ritual career and building the *maloca*. He described the educational process that the young men (from 18-36 years of age) had undergone by the time of the second official dance in 1997 in the following way:

*Many young mambeadores who show an interest in learning all this have had nowhere to practice [until the initiation of the dance-study in Araracuara]. One practises, listens, and learns while celebrating - which is different from being told or learning through observation. This is how far the process has come, [after the first two official dances], and I think we are doing well. At this stage, I cannot say that we need to continue a certain amount of years, or celebrate a certain amount of dances, before we can make a maloca with four pillars [completing the study], (...) because during the first dance many of the young showed fear and doubt, while during the second dance some spoke, had words, had opinions, had questions. During the first dance, it was as if we were talking of another world, in spite of this being the true education, where the mambeadores, the young, commence to practice. It ceases to be theory and becomes reality. What one knows is tested and approved or disapproved. If one person knows this plant, that plant, or another - this is what is being tested through comparing results of riddle cracking. This is when reality is understood. By realising which questions are difficult to a person, he may focus his effort better. The riddles that a person had no difficulty in guessing, indicates what he has learned well [to himself and to others]. These are the results you see from a dance (Kronik 1997).*

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<sup>81</sup> The elder person Preuss worked with is referred to as a grand chief, contrary to Belisario, who is still a student in the process of becoming a master of the dance.

During the first official Dance of Fruits in the *maloca* of Araracuara, the test only took a few hours. During the second official dance, which I was invited to document (Kronik 1997), the test went on from afternoon until midnight, and during the third dance, they expect the test to continue until dawn.

Riddles were expressed in three types of situations:

- First, when the guests approached the *maloca* individually to drink *caguana*<sup>82</sup>
- Second, when they entered as a group led by their riddler, who is their authority during the dance. Several decided to enter on their own in order to test particular issues, or to express a moral statement concerning the organisation of the event by means of a riddle. Since every male guest has the right to enter with a riddle, a number of individuals enter alone to test the owners and to strengthen their own prestige. The main entries were made in two groups: first the Muinane and then the Uitoto. This is the moment to deliver the fruits and crops to the owners. Both of these events take place during the afternoon.
- Third, after having drunk and unloaded their heavy cargo, the groups of invited guests took turns singing their songs. The song was stopped every now and then. Two male persons from the owners' group then confronted the riddler and one of the elders from his group and started guessing. Only men participated.

The male owner participated in cracking most or all of the riddles. He was assisted by one of the assistants, often with several of the other assistants backing them up with advice. The assistants took turns, often reflecting ethnicity, i.e. if the riddler is from a different ethno-linguistic group than the male owner, then he is assisted by one of his assistants from his own group when possible. Pride and status were clearly gained from successfully assisting the male owner in answering the riddles, whereas shame was inflicted upon those who failed to assist, particularly the owners' close relatives.

While cracking riddles, all four persons involved impersonated one of the more curious and persistent characters in mythology, *Guidoma*. He is known to have a quick tongue and impatient, itchy movements. The hosts tried to crack the riddle in verbal confrontation, extracting hints through rigorous inquiry. But if the riddler feels that they do not progress toward the solution, he gives sign for the song to continue. During the second official dance celebrated in the *maloca* of Araracuara, it took 3-20 minutes to crack a riddle. From 4 p.m. to 12 midnight, they cracked more than 25 riddles and passed the test, although the riddler,

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<sup>82</sup> A cassava starch drink.

Raphael Mukutuy, proud of his own position and capacity, said that they had still a long way to go.

### *Evaluation*

On the second night after the dance, the owners and assistants, the advisor and riddlers, and some of the guests who stayed overnight gathered for an evaluation. They discussed the event and the performance of the different actors. They assessed the diversity and value of the gifts received and related this to the quality and sufficiency of the food and ritual substances that the owners had provided as 'payment' for the guests. Then, they went on to discuss the social order during the day and night of the feast. Finally, they talked about how the preparations and the event had been received by the Creator.

There was general agreement that the second dance of the *maloca* in Araracuara had gone well. The riddler felt there had been a qualitative improvement in the capacity to solve the riddles compared to the first official dance, in spite of the young people, who in his opinion still had a long way ahead of them. Another master of *maloca* who had stayed overnight with his group, continuing the dance for another 24 hours to finish up the cassava starch drink left over from the dance, stated that the hosts should not be blamed for such inability displayed by the guests. Another guest said that the abundance of food, *ambil*, and coca well matched the many varieties his people had brought.

It is explained locally that the evaluation mechanism 'cools down' misunderstandings and/or conflicts, and assesses the effect of the event upon the particular problem which it may have been set up to solve or prevent. It is meant to appease people and spirits and to determine how far the students have come and which issues require more effort on their part. This feature of evaluation also has a long history. Preuss mentions that during the dance he witnessed in 1911, the guests stayed overnight for four whole nights for the narratives related to the feast (1994a). It is noteworthy, however, that negative criticism is rarely spoken directly in the other people's *mambeadero*, and if it is, it is formulated as cautiously as possible<sup>83</sup> (see also Londoño-Sulkin 2000).

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<sup>83</sup> See Echeverri (1997) and Sulkin (n.d.) for a discussion of what intimidates a person's 'coolness' and how face-to-face conflicts are avoided.

*Resilience in a changing world - the dances, historically*

In spite of the historical pressure exerted by various actors and events described above, the dance rituals are still of vital cultural importance. This is also confirmed by Echeverri, who writes:

*Indian culture has been losing ground in several fields, as many elders and other people usually say. The youngsters increasingly speak Spanish, people tend to use more white medicines, tools and so forth; but the [dance] rituals, which demand impressive amounts of work, are well and alive (Echeverri 1997 emphasis added).*

It is difficult to say how long these festivals have been held, but probably for a very long time. Van der Hammen traced the *malocas* and the teaching of dance rituals back 300 years, using ethno-historical analysis (1992). Another figure, which says nothing of the history of the dances but which adds to the temporal dimension of the use of biodiversity in the Amazon, is derived from an archaeological study which indicates human presence and use of palms in the Araracuara Region that dates back 12,000 years (Morcote 1996).

Bartolomé and Juana explained the importance of having a dance of this sort in a community, historically and currently, and also displayed their parental pride in Belisario. Back when they were young

*... when there were large malocas all the way along the path to La Chorrera,<sup>84</sup> the owners or masters of the festival of the fruits of the earth were among the most important people. Our son is now taking such a position. Then, they would celebrate this dance principally as a means of collecting seeds in order to provide protection and abundance for their people. Relatives and friends would come from far away to inquire concerning certain crops. Most often, part of their mission was to acquire seeds, but this may be delicate to ask for in a direct manner. Of course, we all have the seeds we inherited from our ancestors – this is our treasure, but certain events may have held you from passing on certain seeds from one season to another, or from parent to son or daughter. This may be due to work, money outside, or personal illness restraining you from opening the forest, or as in the days of the war with the Peruvians, or during the rubber period, or your crops may have been eaten up by plagues. In those situations, the masters of the Dance of the Fruits may provide protection [facilitating access to seeds]*

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<sup>84</sup> La Chorrera is a multiethnic but mostly Uitoto centre like Araracuara. It lies eight days away, following a path which crosses the land and savannahs of “the Centre” where these peoples originate.

(Bartolomé Castro and Juana Suarez, Uitoto and Muinane elders, field notes 1997).

Preuss witnessed a dance ritual at the beginning of the century and documented the religious and, to some extent, the social aspects of some of the festivals. If we look at his accounts from the Dance of Fruits<sup>85</sup> referred to above, it springs to mind that both the objective (protection of community in terms of security, health, food supply, and unity against malevolent forces), key features (exchange of fruits, songs, riddles, and narratives), and social positions and roles (riddler, owners, assistants, guests) have remained quite intact.<sup>86</sup>

But this does not imply that they, the knowledge, or the seeds and fruits exchanged remain static. Echeverri indicates how the drastic population decrease has led to closer ties among the ethnic groups, both through necessary marriage alliances (partly to avoid incest and conflicts) and also in filling the posts or public positions required in each ritual.

*Usually each maloca has a main 'contending' maloca<sup>87</sup> [during the celebration of a dance], whose members lead the other invited groups in singing and in ritual exchanges. Due to the population loss of several of the groups, contending malocas often belong to ethnically different groups. In this manner, rituals play an important role in the redefinition of a pan-ethnic sense of community (Echeverri 1997).*

Echeverri sets out to understand the pan-ethnic reconstruction of culture after the dramatic population decrease. Constructing a new sense of community naturally also affects which knowledge is valid for dealing with different problems. He argues that there is a process of secret labelling of parts of the ritual discourse, which to his understanding 'does not fit' with the construction of a common meaningful discourse.

Preuss' work concerning the social significance of being the proprietor of a rich agricultural production confirms the statements of Echeverri and Bartolomé

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<sup>85</sup> Or the "festival of ball playing", as it was referred to then, named after a game which was played during the festivities.

<sup>86</sup> He argues that what motivates the people to work for and to celebrate the dances is not merely the pleasure of dancing, but the objective of the event. He refers to statements from conversations he had with different Uitoto informants, e.g.: "We don't dance without purpose, although you (white people) may think otherwise. In our festivals, we tell our stories." And "We organise many dances; once a dance is over, we stay at home to work to prepare the next. (...) We follow tradition even when we don't dance; we work exclusively to be able to dance." (1921:177)

<sup>87</sup> The *contendor* or 'contending maloca' referred to by Echeverri is the same position and function that I have termed riddler.



Castro and Juana Suarez. Preuss, who collected and transcribed large parts of the Uitoto mythology,<sup>88</sup> wrote:

*Judged from the myths, the power of a leader was not insignificant in such communities. He would stand out due to his possessions, principally his sown fields [sembrados] and his adornments (1994a).*

Based on the previous analysis, we may conclude that the festival of the Fruits of the Earth has been and is still an important cultural institution for the conservation and use of functional biological diversity through a well-structured collection of seeds. It is also important for the maintenance of a complex knowledge system to store and transmit information on the management of, for example, biological diversity. Violent encounters with actors from the greater society, which have caused the historical decline of the human population in the area, have been instrumental for the introduction of parallel and competing knowledge domains, whereby both ritual and other discourses are being further re-negotiated. While the norms and rules of the institution are maintained during such turbulent times, the knowledge, which is debated and exchanged, changes.

In the process of cultural career, such as the Dance of the Fruits of the Earth, specialists are formed and are gradually given more and more power to delegate work and to settle disputes and establish truths. However, the study also aims to improve the participating assistants' abilities to address the problems they encounter in life. As shown in table 5.1 on the distribution of factual knowledge, participation in the cultural institution of the dances also correlates positively with the knowledge of plants, more specifically with the ability to identify palms by their names and uses.

### **The ideas behind making a gene bank**

In this dissertation, I am working with peoples and cultures that only use written communication or storage (in Spanish) in their contact with greater society. They are situated in one of the most diverse places in the world, biologically speaking. Furthermore, they have historically been dependent on the possibilities and constraints of the resources offered by the natural environment. Hence, it requires little imagination to understand the need to develop and maintain efficient mechanisms for communication and verification of knowledge, and for the distribution of responsibilities for various knowledge domains. The quantitative ethnobotanical surveys from the Amazon Basin mentioned at the beginning of the previous chapter reveal that the percentage of all plant species known by indigenous people, compared to the total amount of all species, is very high and in some cases close to 100 percent (Boom 1987; Posey and Balée 1989). This confirms the

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<sup>88</sup> But who unfortunately did not go into production-specific work.

presence and active maintenance of efficient and highly developed means of storing and transmitting knowledge and plant genetic material. The Dance of Fruits is an example of a highly developed and efficient mechanism for *in situ* conservation and exchange of plant genetic material.

*Seeds of the dance – seeds of abundance - making a regional in-situ seed bank*

The riddler and the advisor explained (on separate occasions) that on the one hand the guests are committed culturally and socially to bring their best or most rare species and varieties upon the request of the hosts. The owners, on the other hand, are committed to distribute seeds they receive, both during the dance (to the assistants) and whenever asked. Having established through open-ended inquiry that the effort of collecting, distributing, and cultivating a wide variety of seeds is both a salient and explicit feature, I asked what was done to make sure that the seeds received are of high quality and/or have particular characteristics. The owner of the dance responded:

*It is important that we all have access to the same plants. Thereby, we avoid diseases and theft. Therefore, I select two riddlers, one from each ethnic group. Their pride depends upon what seeds their people bring. They make sure they bring the best they have. He is happy when they bring many different kinds of plants (Belisario Castro, field notes 30/9 1997).*

Some of the guests attending the second dance of the *maloca* of Araracuara decided not to bring a wide variety. When I asked why, several said they “*had had little to offer*” or “*had had little time*”. Some of the ‘traditionalists’ argued that “*the festival seemed to be badly organised*” or that “*tradition was not followed from beginning to end*”,<sup>89</sup> and they substantiated this criticism by the ‘fact’ that Belisario’s uncle, Mariano, the process advisor, did not have the spiritual power to hold back the rain from the moment of entering the *maloca*.<sup>90</sup> Mariano, himself, was very sorry he had not succeeded in this, and his mood was clearly marked during the first hours of the dance events. But many of the several hundreds of guests did bring large quantities of what several claimed to be their best varieties of the plants in question. In particular, they brought specimens and seeds of cas-

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<sup>89</sup> The ‘traditionalists’ were pointed out to me in a livelihood categorising exercise I developed (see “Living Knowledge”, Kronik n.d.).

<sup>90</sup> As the Dance of Fruits is meant to heal community problems that manifest themselves as diseases, rain at the start of the dance that causes the participants to get wet on their way to the *maloca* and while dancing in front of it may create the undesirable risk that people catch cold after the dance. This would counteract the intentions and could lead to criticism of the owners and not least the experienced advisor.

sava<sup>91</sup> and pineapple, which were the plants being studied during the second dance, but also varieties of other plants.<sup>92</sup>

These fruits and their seeds, which are brought to the hosting *maloca* from forests and forest fields within a radius of more than 100 km, are traded for food and hospitality and distributed among the assistants. Before the second official dance of the *maloca* of Araracuara, most of the assisting couples knew which seeds and fruits they would 'go for'. Although the dance focused on cassava and pineapple, Ana and her mother told me that they needed varieties of chilli peppers, as they had what they needed of other plants. After the dance, they showed me a basket included in their 'payment' that contained more than 300 peppers of six varieties.<sup>93</sup>

Interviews and observations showed that there is a special code for distributing these seeds. An assistant receives seeds that he/she does not already have. The number of varieties and amounts correspond to the work done during the preparations. In some cases, the assistant obtains the plant corresponding to the riddle he guessed. The hosts are in charge of distribution, but they rarely receive any for themselves. They receive knowledge, social status, and pride. The hosts exchange seeds with the riddler.

The seeds received during a dance of this sort are sacred and must be sown by the assistants of the host – thus generating, over the years, an important *in-situ* gene bank. These seeds have already been prepared spiritually and should therefore not need any special additional care.

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<sup>91</sup> Sticks in the case of cassava (*Manihot esculenta*).

<sup>92</sup> Plants such as chilli (*capsicum chinense*), ñame (*dioscorea trifida* and *dioscorea alatta*), mafafa (*xanthosoma* and *colocasia*), several varieties of peanuts (*achis hipogea*) and guacure (*poraqueiba sericea*), uva caïmarona (*pouroma cecropiifolia*), and sugar cane (*saccharum officiale*) among others.

<sup>93</sup> Jaij+, jimoj+, myuboj+, kaikuruj+, godobej+ and tioj+.

Text box 5.4: Two examples of seeds received during the second official dance in Araracuara, 1997

MIRIAM	<p><b>1. Official dance of guacuri</b>                  2 Baskets of peach palm, <i>chontaduro</i> (<i>bactris gasipaes</i>)                  2 Baskets of avocado (<i>persea americana</i>)                  1 Basket of yugo.                  2/3 basket of sugar cane (<i>saccharium officinale salish</i>)                  Green guacuri (<i>poraquiba sericea tul</i>)                  Jopeño, yellow guacuri (<i>poraquiba sericea tul</i>)</p> <p><b>2. Official dance of cassava and pineapple</b>                  “We received great quantities of everything”                  Canagucho (<i>mauritia flexuosa</i>)                  Peach palm, <i>chontaduro</i> (<i>bactris gasipaes</i>)                  Uva caimaron (<i>pouroma cecropiifolia mart</i>)                  Maraca verde (<i>theobroma bicolor</i>)                  Pumpkin, <i>ayama</i> (<i>cucurbita</i>)                  Guama (<i>inga edulis mart</i>)                  Milpesillo (<i>oenocarpus bacaba</i>)                  Yuca (<i>manihot esculenta</i>)</p>
AURELIO	<p><b>1. Official Dance:</b>                  Peach palm, <i>chontaduro</i> (<i>bactris gasipaes</i>)                  Guacuri (<i>poraquiba sericea tul</i>)                  Kaimo (<i>uteria caimito raldk</i>)                  Uva caimarron (<i>pouroma cecropiifolia mart</i>)                  5 varieties of chilli (<i>capsicum</i>)</p> <p><b>2. Official dance:</b>                  Peach palm, <i>Chontaduro</i> (<i>bactris gasipaes</i>)                  Guacuri (<i>poraquiba sericea tul</i>)                  Milpes (<i>oenocarpus bataua</i>)                  Borugo, animal                  Pineapple, <i>piña</i> (<i>ananas comosus</i>)                  Cassava, 5 varieties of bitter cassava (<i>manihot esculenta</i>)</p>

### Quantitative analysis

Six months after the event, a post-dance survey showed that all the assistants had sown the seeds they had received during the dance. Although the seeds are known to be sacred, which should guarantee an abundant harvest, many tested their productivity by sowing them next to their own seeds. This, I think, is a prime example of the cultural scepticism that seems fundamental to their knowledge system.

To know you must ask; to make sure you must see; and to make others believe, you must demonstrate in practice.

One of the most interesting results of the livelihood classification exercise was the consistent indication of the gradually increasing importance of participation in cultural institutions like the dances, the *mambeadero*, the *Cabildo* and the *minga*. The level of participation among *leaders* and *advisors* is high compared to the people classified within the cultural *individualist strategy* and the *non-cultural individualist strategy*, whose participation is characterised as low or non-existent.

In the following, I have chosen to try to classify the people I worked with<sup>94</sup> according to the kind and degree of participation in central institutions for the learning and exchange of knowledge, food, and plant genetic resources. The case I use is the “dance institution” described above, which ties together the main indigenous institutions and practices and is celebrated in a series of biannual events.

To summarise briefly: What is referred to locally as a *dance*, or a *career*, is a process-oriented and problem-oriented study taken on and celebrated by the owners of a *maloca*. The course of study is composed of a series of dances. Each dance celebrates and examines particular knowledge domains. The study period is usually 5-10 years. After final graduation, the couples in charge of the *maloca* become ‘masters’ or ‘owners’ of the studied dance. An owner of a dance qualifies as ‘examiner’ and as ‘process advisor’.

In the subsequent statistical analysis, both ‘students’ and ‘owners’ are grouped together in the same category. The residential unit (student couple) must gather a group of assistants. Originally, these would come from the same kin group, and many used to live in the same *maloca*. But due to the dramatic events mentioned earlier, which caused population decreases over the last century (Gómez, Lesmes, Rocha 1995), the communities are in the process of becoming more mixed, ethnically and otherwise (Echeverri 1997). Therefore, the assistants are now often a blend of kinship alliances and friends from the vicinity. Since the assistants participate in all the material and ritual preparations for each event, agro-ecological and other knowledge concerning production and processing is widely discussed and distributed. The third category consists of those who attend the actual dance without participating in the preparations and those who do not attend at all.

According to the results derived from the palm identification exercise, ethno-botanical knowledge is *not equally* distributed between those who participate in cultural institutions and those who do not. Considering this, I have chosen to divide this theme into two sets of statistics. The first (table 5.1) explores the relevance of active participation in the described cultural learning process. The variables are ‘participants’ and ‘non-participants and guests without special roles’.

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<sup>94</sup> See chapter three for criteria for the sample of persons.

The second set (table 5.2) divides active participation according to the function or role people have while participating. The variables are 'owners, examiners, and process advisors', 'assistants', and 'guests' who simply attend to have a good time and also people who do not attend at all.

The results show likelihood of positive correlation between the level of participation and knowledge of palms, measured by the knowledge of use-categories and ability to identify different palms. The higher the level of participation, the more use categories are mentioned (table 5.1). The active people identify more palms and mention significantly more uses in total (63 to 40). They also mention significantly more uses in 10 out of 11 use groups.

The tendency in table 5.1 is further confirmed in table 5.2, which indicates that the 'owners' not only identified all of the 23 palms, they also mentioned more use categories, in total, per palm and in all of the use-groups, than the rest. This shows that undertaking the responsibility of such a study (and the traditional status related to it) correlates with the knowledge of plants, regardless of whether these plants are a particular focus of the study or not. We cannot conclude, however, that there is a one-way causal relation. The explanation may also be that people who are interested in learning about plants are also the ones who choose or are chosen for social leadership. I am not interested in simple causal relations, however. It is more interesting to see which dimensions go together. The conclusion supports the thesis of the inherent relationship between knowledge production and maintenance and the livelihood strategies people embark on.

Just as important is the second conclusion that can be drawn. The assistants identify more palms and mention more use categories, in total, per palm and in all of the use-groups, than the guests/non-participant category. This indicates that this learning institution is rather horizontal. As mentioned above, it is difficult to test whether there is a causal or an accidental relationship between knowing and participating. However, answers from the interviews indicate that both detailed factual knowledge as well as strengthening of analytical capacities are ascribed to 'the cracking of riddles', which is the dance institution's special feature for testing and distributing knowledge. Hereby, the impact of participation in this institution on the state of knowledge about plant diversity is illuminated.

<b>Table 5.1: Use by participation in the cultural institution, Dance of the Fruits of the Earth</b>	<b>Owner, examiner or assistant</b>	<b>Guests and non-guests</b>	<b>Total</b>
	<b>n=20</b>	<b>n=21</b>	<b>N=41</b>
<i>Identifying palms and indicating uses in plot with 23 palms</i>			
Total number of use categories per person	62.55**	40.48	51.24
Number of palms identified (of the 23)	21.05	18.1	19.54
Number of uses mentioned per palm	9.72*	2.8	6.18
<b>Technology 1</b>			
Number of construction, utensils, crafts, Agriculture and hunting-related use categorie	29.85**	19.33	24.46
<b>Technology 2</b>			
Number of utensils, crafts, agriculture and hunting- related use categories	21.5**	13.3	17.3
<b>Food-related use categories</b>	19.75**	14.19	16.9
<b>Construction-related use categories</b>	8.35**	6	7.17
<b>Utensils-related use categories</b>	4.75**	2.33	3.51
<b>Craft-related use categories</b>	7.15**	5.19	6.15
<b>Agriculture-related use categories</b>	1.65**	.52	1.07
<b>Hunting-related use categories</b>	7.95	5.24	6.56
<b>Ceremonially related use categories</b>	8.4**	4.81	6.56
<b>Medicine-related use categories</b>	3.95**	1.89	2.88
<b>Hygiene-related use categories</b>	.55**	.24	.39
Level of significance by Kruskal Wallis non-parametric comparison of means			
**(<0.05) *(<0.1)			

<b>Table 5.2: Use by participation in dance</b> <i>Identifying palms and indicating uses in plot</i> <i>With 23 palms</i>	Owner, examiner, advisor n=8	Assistant n=16	Guests and non- guests n=17	Total N=41
Total number of use categories per person	63.38*	57.38	39.76	51.24
Number of palms identified (of the 23)	23	19.38	17.94	19.54
Number of uses mentioned per palm	8.5	5.6	2.8	6.17
<b>Technology 1</b>				
Number of construction, utensils, crafts, agriculture and hunting-related use categories	30	27.44	19.06	24.46
<b>Technology 2</b>				
Use categories related to utensils, crafts, agriculture and hunting	21.63	19.56	13.12	17.29
<b>Food-related use categories</b>	20.25**	18.38	13.94	16.9
<b>Construction-related use categories</b>	8.38**	7.88	5.94	7.17
<b>Utensils-related use categories</b>	5**	4.31	2.06	3.5
<b>Craft-related use categories</b>	7.1**	6.63	5.24	6.15
<b>Agriculture-related use categories</b>	1.75*	1.31	.53	1.07
<b>Hunting-related use categories</b>	7.75	7.31	.53	1.07
<b>Ceremonially related use categories</b>	8.5*	7.56	4.71	6.56
<b>Medicine-related use categories</b>	4	3.5	1.76	2.88
<b>Hygiene-related use categories</b>	.6	.38	.29	.39
Level of significance by Kruskal Wallis non-parametric comparison of means **(<0.05) *(<0.1)				



## **Conclusions about knowledge production and place, culture, and social change**

To summarise regarding the local indigenous knowledge system, the Muinane and the Uitoto have developed a detailed framework for learning and organising different bodies of knowledge. The explicit focus on a problem-oriented and process-oriented approach underscores with unique clarity the complex ties between knowledge production and culture. This was displayed during the specific daytime and night-time activities that emphasise the importance of strengthening the capacity to solve problems through rigorous learning of cultural research methodologies. Several institutions stand out as salient in the local culture in general, and concerning the social and cultural learning processes in particular. People's sense of locality is embodied and negotiated within the norms, rules, and shared meanings of these institutions.

What also emerges from the two empirical chapters (chapters four and five) is that people live differently, and that this affects their knowledge of biodiversity. Age, gender, and place are among the key dimensions that explain such variation, as demonstrated in chapter four. However, each of these dimensions lacks sufficient explanatory power to understand this variation. The analysis seems to get stuck within these categories. Therefore, two multidimensional variables were designed, the so-called 'locally perceived livelihood strategies' and 'participation in cultural institutions'.<sup>95</sup> In the course of the above analysis of Muinane and Uitoto knowledge and the use of palms, the conclusions from chapter four are further confirmed. Livelihood strategies are inextricably linked to knowledge on biological diversity, and thus important to take into account when dealing with use and conservation of biological diversity. Employing a relatively simple card-sorting exercise and a data processing technique much like that developed by Phillips and Gentry (1993) proved useful for breaking down social interaction into different livelihood strategies and institutions for cross-correlation with ethno-biological data. However, application of the outlined methodology in the communities in the Colombian Amazon indicates that contact with modernity is not a one-way adverse process leading to acculturation and subsequent loss of knowledge. In and around Araracuara, different livelihood strategies involve different types of contact with modernity. Some livelihood strategies involve contact mainly consisting of monetary transactions, while others involve more political and administrative types of contact. Some types integrate better than others – or do less harm to everyday engagement in social processes of the production,

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<sup>95</sup> Participation in the analysed institution turned out to be a useful indicator, both of knowledge on palms and of livelihood strategies. The more people participate and are socially involved, the more they seem to know.

reproduction, and distribution of knowledge. Leaders, whose main contact with larger society is through meetings with modern institutions, are likely to learn different things and be influenced in different ways than indigenous day-labourers and individualists in their meetings, for example, with market-based actors. Both cultural leaders and modern leaders are active in cultural institutions, whereas most of the people classified as *non-cultural individualists* are not. The reason why leaders and those who are culturally active express a better knowledge of plant diversity is partly explained by their frequent access to both the high and the cultivated forests. But it is also due to the learning processes practised during their involvement in such forums as the *mambeadero*, the *dances*, and the *mingas*.

Although the rules and norms of the institutions were often referred to locally as rigid in their demand for highly moral behaviour, and the ontology was described as exclusive, absolute, and essentialist, they are, in my understanding, highly flexible in relation to social change. The cultural emphasis on what may be termed 'the focused inquiry', the process-oriented learning, and also the experimental nature of many daytime activities, are what I see to be the most central features for maintaining and developing the knowledge system. The cultural notion that one is not able to learn much without studying the methodology of how to learn to understand complex relations, opens up the system and provides for rather smooth contact with modern bodies of knowledge. Through such processes, non-cultural information becomes moderated, accepted, or discarded, and read into one of the dominating discourses: how to deal with nature. Hereby, the large group of people who carry out culturally based practices in production and reproduction, and among them the large group of people involved in the described institution of the dance, are better equipped to adapt 'non-local' knowledge to the local context. Or, in Aurelio's words:

*If we can crack the riddles of diseases and thus learn about the diseases of plants and fruits etc., we may crack and learn about problems we have - the diseases we suffer, and thereby overcome them and cure and defend ourselves. Therefore, we undertake this practice and capacity building of riddle cracking. He who has such practice, knowledge, and experience with riddle cracking can also discover and heal his problems in life (Aurelio 1997, transcribed from video-interview, Kronik 1997).*

I acknowledge that the conclusions of the study are limited by the limited access to certain knowledge domains. These include large parts of the medicinal knowledge, which is secret-labelled and which for moral and political reasons, it is not advisable to explore in depth. Also certain of the women-dominated knowledge domains were inaccessible, including their forums of learning. However, from the available sources, I gather that women's agricultural knowledge is also flexible in relation to social change, in the sense that it is largely based on experimentation. Thus, knowledge production not only depends upon place and concrete experience but also upon cultural and religious institutions. These sorts of institutions

function in the socio-political context that influences them. What does this mean for the survival and well being of the cultural knowledge system – and ultimately local and global desires to benefit from biological diversity? Social change leading to the dismantling, degeneration, or low degree of participation in institutions important for distributing, generating, and storing knowledge, and even for conserving biodiversity, may lead to loss of biodiversity and/or failure to learn and to transmit knowledge. However, in the cases presented, and taking the dramatic historical events of violence and social pressure into account, the cultural system does not seem to be under severe threat. Rather, there are signs of reconstruction of salient elements of the system in Araracuara.

## CHAPTER 6

### CONCLUSIONS

Admit it – one of the first associations that comes to mind when discussing the subject of indigenous peoples' valuable knowledge on plants – such as medicinal knowledge – is that it is threatened, and maybe even in a process of decay. This study illustrates that it is not so straightforward as that. I do not mean to imply that indigenous peoples' knowledge on biodiversity is not under severe pressure – many contemporary and historical examples indicate that it has been and is. However, there are currently other forces stimulating and strengthening the making of indigenous peoples' knowledge.

The contemporary view of local knowledge production on biological diversity places great emphasis on its relation to context. However, context is often rather narrowly limited to human interaction with nature, primarily material production. Knowledge is thus viewed as the 'results of experiences gained accidentally through 'trial and error' or 'learning by doing' in daily dealings with nature, i.e. agricultural production or other uses of natural resources such as hunting, fishing, construction etc. Based on this understanding it has been argued that the 'closer' a group of people has been and is to nature and the less disturbing contact there has been and is with outside knowledge systems, the more they know about nature. However, considering such knowledge processes to be the most important without understanding the cultural framework of which they are part, has contributed to the idea that indigenous peoples' knowledge of plants consists of a vast body of unconnected and incidental facts. It is also supposed that when these more or less undisturbed communities and the nature with which they interact, are put under pressure, then this knowledge is soon forgotten.

I too initiated my research on the basis of this understanding. However, I soon came to wonder how these bodies of knowledge have been and are developed and maintained and why, with the exception of very few ethnographies, so little research seems to explore and analyse relevant local knowledge processes and mechanisms concerning biodiversity. It is not that there has been a lack of phenomena to study. Indigenous peoples have not only developed impressive folk taxonomies and invaluable technologies such as pottery making, weaving, and agriculture. They have also achieved these rich domains and skills and not least maintained them over time, which surely requires highly developed knowledge processes and social mechanisms.

Cultural institutions in Araracuara do not seem to be under severe threat despite the dramatic historical events of violence and social pressure in the region. Rather,

there are signs of reconstruction of vital elements of the institutions there. Currently, several processes of political engagement are contributing to this reconstruction. Indigenous authorities have initiated activities directed towards the defence and development of living conditions through cultural as well as modern institutions. There is an on-going struggle for land in the region. During the last decade, the Colombian government has handed over more land to indigenous people than any other government in the world. These actions are based on the legislation achieved under the new Constitution of 1991, which is explicit on indigenous peoples' rights to own and manage ancestral areas. The indigenous people involved in the area engage in and employ the rhetoric of diverse types of debates, which contribute positively to the resolution of some of their problems: first, the national debate on indigenous identity and rights; second, the international and national debates on biodiversity that claim that biodiversity is valuable, threatened, and that indigenous people have valuable insights. Thirdly, the indigenous actors engage in ritual narratives and dialogues on the management of nature.

In Araracuara, I discovered that the ways people choose to live with respect to their orientation toward their material production and their inter- and intra-cultural relations, correlates with the knowledge they express concerning biological diversity. This finding points rather overwhelmingly to the importance that the social and not least cultural organisation of material production and reproduction has for the knowledge expressed by different segments of the population concerning the usefulness and visual characteristics of the highly diverse plant group of palms. The common understanding that there is a positive correspondence between the degree of practical interaction with natural resources in a place, and the existing knowledge of related biodiversity, is supported by my results.

Women on average know more about agricultural production and food processing, and men know more about plants of the closed forests. The explanation for this is simple: This corresponds to the general principles of the organisation of material production and reproduction, namely that women are largely responsible for food production, and men for extractive activities in the less cultivated forests. Similar conclusions can be drawn for other dimensions, such as age, ethnicity, access to natural resources etc., namely that the older people become, the more they will know, on average.

Together, these dimensions underline the importance of place or context for knowledge production on biological diversity. However, it soon became apparent in the Araracuara region that the picture I developed of the social distribution of knowledge on plant diversity was less than complete when such standard variables of social organisation were employed and isolated. It cannot be assumed, for example, that any old person will know more about plants than a young one. The variation within each of these dimensions is too great. Two multidimensional variables developed concerning the ways people live and their kind and degree of

participation in certain social and cultural institutions reveal that knowledge and learning are not simply distributed according to the activities related to material production. Thus, indigenous peoples' knowledge production is not simply a matter of undifferentiated routine-like interaction with nature. Individuals as well as social and cultural groups pursue different strategies and have different needs. These strategies, influenced by the ways in which people relate, think, produce, feel etc. affect the production, reproduction and distribution of knowledge. This explains why there are differences with respect to what people of the same age, ethnicity... know.

I am fascinated and positively surprised to discover that, contrary to what might be expected, there are tendencies toward increased participation in cultural mechanisms, institutions, and practices that is contributing to a strengthening of peoples' capability to confront everyday problems. This is happening in spite of the heavy pressures exerted on local livelihood and natural resources during the last century and to the present day.

There is a significant overlap between the indigenous people in the Araracuara region who participate in these institutions, and those who express vast and detailed ethno-botanical knowledge. The overlap is even clearer when this participation is qualified on more or less advanced levels.

In addition to the positive relationship between the ways people choose to live and *what* they learn, their way of life also relates to *the ways* they learn about plants. Certain livelihood strategies draw on a number of knowledge institutions and others do not. These knowledge institutions not only involve sets of rules and norms and exchange of information, but also well-established learning processes and pedagogical techniques aimed at increasing the individual and collective intellectual capacity to solve problems. Advanced research-like activities have been developed and formalised into institutions, complex learning systems, and careers and positions of specialisation.

In short, the knowledge institutions I have studied favour principles of open-mindedness, social engagement, developed reflective abilities, and eagerness to learn and put the learned into practice. These highly developed reflective practices, coupled with the rather successful struggle for the protection of basic rights and identity, contribute to the resilience of the cultural learning and livelihood system, even in situations of instability, massive pressure on natural resources, and the presence of powerful promoters of social change.

A central interface between cultural and modern means of communication and storage of information takes place in the meeting between the oral and the written. The joint making of the publication, "Fééjahisuu – Palms of the Grandchildren of the Centre of the World" (Kronik *et al.* 1999) is a good example that demonstrates how cultural learning processes are becoming reflective in a new manner. During the process of establishing, finding, and describing the range of palms known by the Muinane, I went through the information with individuals at least a dozen

times. Finally, a forum was established where the three clans agreed upon the content of the book after having negotiated intra-cultural variations in the names and classificatory order of the 80 palms. Making the book was a precondition made by the three clans for allowing my research. The book is now part of their school curriculum. People often felt uncomfortable during the process of making what many saw in the beginning as “the finite, static truth” about palms, in spite of their declared interest in having the product made. However, the process of correcting, adjusting, and negotiating the content and order of the domain, contributed to raising the critical awareness towards written texts, and demonstrated the value of their reflective practices and procedures in establishing good knowledge.

These reflective practices and new ways of employing and developing them have contributed positively to my construction of knowledge production in the study areas. My understanding has thus developed and been informed iteratively within the field of theory, insight into and deconstruction of societal debates, and insights into local ways of thinking about and acting upon knowledge about the relationship between human beings and nature. The continuous validation of my knowledge by key persons and key groups, for example in the confrontation of knowledge constructions and in the processes of making the two films (Kronik 1997; Kronik and Krøyer 2001) and the book of palms (Kronik et al 1999), increases the value of the results. Steinar Kvale refers to these phenomena as “intersubjective agreements” (Kvale 1996). His concept is a reflection of the current emphasis within the social sciences on regarding truth as being negotiated in a local context. Hereby, the interpretative community is extended to include the subjects investigated and the lay public. Communicative validation approximates an educational endeavour where truth is developed in a communicative process, with both researcher and subjects learning and changing through the dialogue.

This is also common to other cultural interfaces in the region. Although the rules and norms of the institutions in Araracuara and Chukik+ are often referred to as rigid in their demand for highly moral behaviour, and the ontology is described as exclusive, absolute, and essentialist, they are highly flexible in relation to social change. Locally, the emphasis is on inquiry, process-oriented learning, and also the experimental nature of many daytime activities, which I see to be the most central processes for maintaining and developing the knowledge system. These processes and the cultural notion of the inability to learn good knowledge without studying the methodology of how to learn to understand complex relations, opens up the system and provides for rather smooth contact with modern bodies of knowledge. Through such processes, non-localized information becomes accepted or discarded, moderated, and read into one of the dominating debates concerning how to deal with nature. Hereby, the large group of people who carry out culturally based practices in material production and reproduction, and among them the large group of people involved in the described institution of the dance (in chapter 5; Kronik 1997; Kronik and Krøyer 2001), are better equipped to adapt

'non-local' knowledge to the local context. In this respect, the agricultural knowledge domain, for example, is highly flexible to social change, in the sense that it is largely based on experimentation.

This contributes to the conceptual debate concerning what constitutes and influences knowledge production. Knowledge production does not only depend upon a particular place where it is generated and maintained and on concrete experiences gained through material production. It also depends upon the cultural framework, which among other things consists of and is developed by knowledge institutions and institutionalised practices, processes, and relations. In my view, this deserves the attention of research and development efforts concerning current and future use and conservation of biodiversity.

Both cultural frameworks and knowledge institutions are influenced by and influence the socio-political context in which they function. Further understanding of the dynamic and differentiated nature of cultural knowledge systems and the conditions for their survival, well-being, and development could facilitate targeted efforts to satisfy local and global demands to benefit from biological diversity. Some types of social change lead to the dismantling, degeneration, or low degree of participation in institutions important for distributing, generating, and storing knowledge, and even for conserving biodiversity. This may result in loss of biodiversity and/or failure to learn and to transmit knowledge.

The often young indigenous political leaders must learn to master the arguments of these various types of debates. In some cases, this leads to a schism between the leaders and their constituencies; in other cases, both leaders and their cultural groups benefit from the wider potentials. To navigate in the various political arenas and obtain the best results possible, indigenous peoples' organisations form strategic alliances with NGOs (and their lawyers and anthropologists etc.) and international agencies, and they are assisted locally by various bodies and advisors.

A central debate which indigenous people log onto in Colombia is that on constitutional rights. This debate is special in that a strong legal body backs it, and state agencies are assigned the task of carrying it out. While this is probably the debate from which indigenous organisations have gained most in terms of political and cultural rights and to some extent economic benefits, the reach of their struggle is also limited within this debate, as large parts of the areas populated by indigenous people are outside government control. Indigenous groups are up against opposing economic and political interests, often enforced or mediated by armed groups as well as groups of civilians who are pushed in or pulled out by the development of the agricultural frontier. What is interesting is, that in order to benefit from the political space offered through the improved constitutional rights, indigenous actors have to emphasise certain aspects of their culture and ways of living in their dialogue with the state, while other activities recede into the background. This gives certain groups within the indigenous communities increased space to pursue



their strategies and strengthen their positions. An example is the discussions in the Araracuara region concerning bilingual education. One group of 'traditionalists' aims to recover completely what they see as lost ground to Colombian modern, Christian education, while more moderate people work for a combination of the best of both learning systems. When the traditionalists gain influence, they make demands on their leaders with regard to their public appearances and way of living. This also has a tendency to strengthen cultural identity and institutions.

Several leaders from the Araracuara region have learned to express arguments that reflect the context they are part of and the actors they are confronted with. They have benefited from the developments toward increased legal rights and have learned how to work the political system through collaboration with a few politically engaged NGOs and through high school scholarships in Colombian cities. Some have further explored the political arguments for cultural diversity through work and friendship with anthropologists doing fieldwork in the region over the past decades.

Indigenous peoples' organisations use the international concerns about biodiversity expressed in the *biodiversity* debate strategically in order to gain and/or further political objectives, including land rights, decentralisation, and cultural survival. Unlike other demands formulated and/or joined by indigenous peoples' organisations and supporting actors, in which ethical concerns are central, the recent line of argument within the political struggle of the indigenous peoples' movement is based on their ancestral and on-going creation of and proprietorship to specific valuable knowledge. In quite a number of the development project proposals developed by indigenous leaders on which I was asked to comment, and in many speeches I have heard delivered to state officials, development NGOs, and researchers visiting the region, or during national-level conferences, references to their knowledge of the forest abounded. This knowledge was cited as the necessary precondition for successful use of natural resources.

In the international debate on biodiversity, this argument continues, saying that these particular lifestyles rest upon certain cultural and biophysical circumstances, so that if these are threatened, the processes necessary for the maintenance and development of such "*knowledge, innovations and practices*" (CBD 8j) will also be threatened. These links "*between conservation of biological diversity and cultural diversity, and the dependence of such communities and the continuation of their traditional access to biological resources*" are now recognised ([www.biodiv.org](http://www.biodiv.org)). The processes leading to the creation of such knowledge are embedded in so-called traditional lifestyles.

Considering the heterogeneity among and within indigenous peoples' communities and organisations, it is promising to see how far they have managed to come in influencing and opening such political spaces as the negotiations on the Convention of Biological Diversity. I have already stressed the indigenous move-

ment's strategic cultural politics as one explanation for their current successes. However, the rhetoric and alliance building would be short-sighted and of limited effect had they not been substantiated with very strong arguments concerning knowledge of biodiversity and mechanisms to use it and not least, conserve it. The recommendations issued by the Keystone group and the work of academics underlining the need to base future conservation efforts to a much larger degree on *in situ* use and conservation strategies and mechanisms were instrumental in this process. Indigenous peoples' knowledge of the utility and ecological characteristics of plants and their models for conservation have proved to be particularly vast, complex, and detailed in highly diverse environments. The Dance of Fruits is an example from the study area of a highly developed and efficient mechanism for *in situ* conservation and exchange of plant genetic material and is a real contribution to the on-going political and technical debates on the character, usefulness, and resilience of such models and mechanisms.

This line of argument has also manifested itself locally. Young leaders, having attended national level workshops, know the rather simple line of argument by heart, "*for we are the ones who know the forest*"; however, these leaders have been met with criticism, both locally and among national-level actors, for lacking legitimacy. This seems to have influenced some to engage in more cultural institutions and practices, so that as of recently, a new type of leader is emerging. These leaders manage to engage actively in their cultural institutions, such as the *mambeadero* and the ritual dances including dialogues and learning processes concerning knowledge of plants. At the same time, they have the capacity to take part in the national and international debates on biodiversity, including legal claims and technical specificities. And they participate in national cultural diversity debates. They inform their arguments in one type of debate, using arguments learned from another. For example, they employ their experiences with indigenous learning processes and means of conflict resolution; they use their understanding of natural science institutions and research methodology that they learned through contact with the national and international research centre for which many have worked as research assistants or guides; and they use their knowledge of the political and administrative system gained through indigenous peoples' and supportive organisations and their experiences with legal claims and development projects. Their background and the recent years of cultural and modern apprenticeship and leadership have enabled them and their supporters to situate themselves as legal actors, both within the indigenous administrative structure and within greater Colombian society, and thus engage in cultural politics, securing land rights, access to government resources, and developing partnerships with other local, national, and international actors.



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## ANNEX 1

### SPEARMAN'S RHO PAIRWISE CORRELATIONS OF ORIGINAL ORDER BY INFORMANTS

N	P14301	P14302	P14901	P16101	P20908	P21001
P14301	1.000	.473**	.386**	.463**	.511**	.486**
P14302	.473**	1.000	.492**	.330*	.438**	.298*
P14901	.386**	.492**	1.000	.577**	.555**	.479**
P16101	.463**	.330**	.577**	1.000	.527**	.404**
P20908	.511**	.438**	.555**	.527**	1.000	.486**
P21001	.486**	.298*	.479**	.404**	.486**	1.000
** Correlation is significant at the .01 level 2-tailed.						
* Correlation is significant at the .05 level 2-tailed.						

Spearman's rank order correlation test (table above) shows that the same six informants who agreed in their oral statements concerning how people live, feel, produce, and relate to each other, also agree about how the sample from the two communities should be ordered. There is a significant correlation in 29 out of 30 pair-wise comparisons made between the rankings undertaken by these six informants.

First, we must normalise the six rankings, since they were made with different numbers of categories (i.e. one informant made four, another nine categories), into a common scale say from 0 to 100 (e.g. 0-33-67-100 or 0 12.5-25-37.5-50-62.5-75-87.5-100).

The next step is to define score-based categories, representing different livelihood strategies. Based on the average score reflecting the six individual rankings that were found to be significantly correlated, the average P is taken, which means that each person now has an average P, an average score reflecting the six rankings. More logical boundaries emerge comparing the mean values (P) of the six rankings of both the median, the mean, and the 25, 50, and 75 percentiles, to establish the boundaries from the higher and lower percentiles of each category. This enables a further analysis of the quantitative ethno-biological analysis on the use and management of palms. To facilitate this analysis, I have run a one-way anova comparison of means and used the Kruskal-Wallis test for significant differences.



## **ANNEX 2**

### **LIVELIHOOD STRATEGY DESCRIPTIONS**

<p>14302 Miriam (40) Muinane, Araracuara a. Heads of the communities. Visions for the people and community through institutions. Works without pay. Self-supportive from their sowings. Most contact with the "west". They are governors, casiques, owners of malocas. ..... b. "The orientators" Some contact with health and education organisations. Basis for local government. Relate during festivals to agree on rules and behaviour ..... c. Think much about money. Employed by "instituciones". Part indigenous, partly money. Frequent less "mambadero". ..... d. Think without visions. Live to live. Work in chagra, but not with indigenous organisations. Little capacity for governing and relations with "instituciones". Less or no studies. Lack of visions like the worst pile (e). ..... e. Work hard without results for themselves or the community. Turning "white" in their way of living.</p>	<p>14301 Valdemar (36) Muinane, Araracuara a. People of maioca, culture and tradition. Also manage "national" relations. ..... b. Local government. Manage tradition and culture and also national level in a very direct way (governing). ..... c. Also contact with national level. Participation in (state and NGO) health and education workshops. They study, manage public affairs. Organisations people. Relate much with communities. ..... d. Wish to deal with two fields of interaction. Traditional and national. ..... e. The employed. Think employment. One has cultural relations but has other desires (employment). ..... f. No relations, live to live, no desires apart from "white" values. A few enter the traditional. Don't know ways of living. No participation in organisation. No leadership.</p>	<p>14901 Germán (45) Uitoto, Araracuara a. Think like Belisario (community leader). Live more indigenous than "white". Try to live in peace. The "charla" (ritual dialogue) important. We have changed very little and have little contact with the "white". ..... b. Like group a. From the other community. Still live well with their uses, customs, charla intact. Live further away from white influence.. Speak more the indigenous tongue than we do. ..... c. Women who share their work, ideas, and charla. Mainly from other community. ..... d. Try to live "white" life. Little charla, different thinking. Work like group a. Think money. ..... e. Women who wish to be like the "white". From this community. Money and "white" foods. No communal work. ..... f. Live poor. Their thinking is not to share ideas. They share work and food. Help one another. ..... g. On lookout for money, no chagra, no communal work.</p>	<p>16101 Lizardo (43) Uitoto, Araracuara. a. Fighting for progress for the people. They also debate during bad times. Reclaim the rights ..... b. Enjoy the dialogue. They are "orientators". ..... c. Very spiritual people. Wish all the best. Fight for peace and development. ..... d. Spiritual, relate with everyone. Know how to heal. ..... e. Like hard work, and to help. ..... f. Women who like to work hard. Know songs and how to sing them during certain festivals. ..... g. Hard-working women. Domestic interests. ..... h. Quiet working men, who do not disturb people's lives.</p>	<p>20908 Silvio, 26, Muinane, Chukik+ a. Community leaders. Think of development. Fight at both traditional and national levels. Think progress and "forming" people. Have own houses, in respective communities. ..... b. Wish to acquire knowledge and capacity of leaders to defend themselves and the community. They are in process. Some attend meetings. ..... c. Don't understand organisational principles. Don't have capacity. Live to live. Their work is in the chagra. Do not understand what is development.</p>	<p>21001 Narciso (38) Muinane, Chukik+ s. Talk much about culture and organisations, mainly health and education. Provide traditional advice in charla and songs. <b>Effort to "fit" (encajar) the "traditional" with the "western".</b> ..... b. Most contact with organisations to acquire more presence of the State. Projects, seminars, workshops, housing. They think politics. ..... c. Educators who strive to form honest, serious and tolerant people. They orientate. ..... d. Live for their chagra and their crafts work. Talk of nothing else. Everyday life. ..... e. Local government. Listen to elders' advice and maintain relation to government institutions. Look for projects, jobs, and follow health and education. ..... f. Their mentality is exploitation (cultural notion of those who live from fishing etc. in sacred places). Live from fishing. Personal not communal needs. ..... g. People who always talk about contracts with "instituciones", but never get anything done.</p>
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### **ANNEX 3**

#### **CHECKLIST: KNOWLEDGE PROCESSES LINKED TO THE USE AND CONSERVATION OF ONE OR TWO PALMS SELECTED BY THE INFORMANT**

This checklist was used for 15 conversational interviews. The interview (lasting 2-4 hours) was performed in continuance of listing names of palms and their uses. The choice of a palm was sustained through this activity, and provided a platform for follow-up questions. This list is not meant as a questionnaire, but a checklist, to direct the course of a conversation. The results have all been typed (some 50 pages so far) and one of the ideas behind the exercise is to be able to search for topics by means of a word processing package. Later, other software may be relevant.

Some questions are directed broadly towards the selected palm's role in local economy and reproduction strategy, while most questions are focused on all activities related to food, derived from the same palm.

### Saliency and factual knowledge of palms

Q0. Choose a palm you consider very important - which?

Q1. Which benefits are derived from the use and conservation of the selected palm?

Q2. Frequency of use of a selected palm (during week/month/year).

### Knowledge processes and epistemology

Q3. How do you learn to use/prepare/replant/sow etc. this particular palm?

Q4. Tell me of a few tricks/secrets for handling this palm?

Q5. Whom does one ask to obtain such information/knowledge? What do you do when you need to know whether a fruit is edible/poisonous?

Q17. Do you sometimes try out fruits you don't know? (A variation of q5, often linked to an example of thirst or hunger far from home). The answer was always "no". But of course it led to an explanation of **how** the person discovers the beneficial/non-beneficial domains of the fruit (AO) of interest.

Q21. How can you see whether a person DOES NOT know how to... (Sow, weed, cultivate, collect, select, process, prepare etc.)?

Q29. Now I'd like to focus a bit on what you call 'agronomic knowledge' concerning this palm. (Only two or three palms are planted, so in some cases it is not the farming practices I am trying to understand, but rather the forest management activities I am aiming at.)

(3-4 separate Qs) As I asked before (Q4), do you know of some special trick/secrets on how to sow, weed, take care of these palms? (Q5) From whom or where do you obtain such knowledge? Do you actually do it this way? Does it work?

### Motivation and factual knowledge

Q6. Why do you use this palm for food production? Why do you prepare it this way?

Q7 and Q8. A variation of Q1 and Q2 to try to understand seasonal variation in the reproduction activities related to food production

### Values and market=importance of product

Q9. Are the edible products good for you? Can you get better/tastier/healthier products?

Q10. How is the taste - what can you do to improve it?

Q27. Is there a 'non-indigenous' way of using and benefiting from this palm?

### Work/time=importance of practices (conservation of product)

Q11. Can the products be conserved - for what period of time, and how?

Q12. Is it hard work? Compare to a similar product (of the same or other season)?

Q13. Can you speed up the processing/preparation? How/or why not?

Q24. Concerning the food products from this palm, how do you make sure it does not turn bad over time? (Q11)

Q32. Can it be harmful if it is not prepared well?

Q25. If there is little food, or more people have shown up for dinner than expected, what can you do to increase the volume of the food?

### Institutions/rituals

Q14. Is the palm used for ritual purposes, during the festivals (bailes) etc.?

Q15. Describe how you have modified or discovered other ways of doing things or retrieving benefits from this or other palms. (During the course of asking about **innovations** I discovered that it is prohibited/impossible to invent new things, as every benefit/use is given by the Creator/God. But the term discover, or modify, opens the discussion without the mentioned restrictions.)

Q28. Is it prohibited for some to eat from this palm?

Q30. What does *reglamento* (a culturally determined set of rules on how to do something) mean in this context? Is there a *reglamento* on how to handle this and other palms?

### Access/substituting/acquiring

Q16. If you do not have access to this palm, how do you substitute it to satisfy your particular needs that it covers?

### Social relationships/networks/institutions/history of learning processes

Q18a. With whom do you discuss the making of food?

Q18. From whom did you learn how to prepare .....?

Q19. From whom else?

Q26. Whom do you work together with to make/acquire the product (from seed/tree to end products?).

Q31. Where do you go to find the palm, or from where do you get the seed?

Q34. Who, among your neighbours, do you consider knowledgeable on such matters?



Q35. Who, among your sisters and brothers, do you consider knowledgeable on such matters?

### Triangulation and questions on broader knowledge and preferences

Q22. Show me how to do .....

Q23. Are there other ways of doing it?

### Economic value

A few questions on the local economy in order to further understand the importance of palms, and to get a feel for local strategies under changing circumstances.

Q33. If you or your family do not have time to collect or cultivate these palms, or if you are a newcomer and have not made your *riare* (fruit plantation) yet, then what do you do to get the/similar benefits? (Borrow from friends/relatives, buy substitute products).

Q37. Are there times during the course of the year, when food is scarce? If yes, what do you do to get food?

Q38. What do you do to get money?

Q39. Is it seasonal? Who in the family works mainly in such activities?

### Migration and contact

Q40. Have you lived here long? Where did you live before you came here? Why did you move? (If he or she did - which most seem to have done during their lifetime.)

Q41. How did you live before? Was it different?

Q42. Have you lived and/or visited other parts of the country? Who has, within the family?

Q36. Do you have contact with the white people here? (*Los blancos* is a frequently used term, also to do something in "a white way"). What kind of contact? Do they know of palms?

## ANNEX 4

### ADDITIONAL BASELINE DATA

Additional tables related to chapter 4 (tables 4.1-4.11 are to be found in the text)

		Table 4.12: Occupation (18yrs+) * Ethnicity* Sex					Total N= 246
		Muinane	Uitoto	Other indigenous	Non- indigenous settler	Mestizo	
	n=	37	48	21	25	3	N=134
Male	Farmer	51	71	67	24	67	56
	Fisherman	16	10	14	40	0	18
	Student	16	6	14	8	0	10
	Shopkeeper	0	4	0	8	0	3
	Housewife	5	2	0	0	0	2
	Employed	3	6	5	16	0	7
	Migrated	8	0	0	4	33	4
	Total	100	100	100	100	100	100
	n=	22	48	19	13	10	N=112
Female	Farmer	64	77	84	31	70	70
	Fisherman	0	2	0	0	0	1
	Student	9	4	0	0	0	4
	Shopkeeper	0	2	0	23	0	4
	Housewife	5	2	16	46	20	12
	Employed	0	6	0	0	10	4
	Migrated	23	6	0	0	0	7
	Total	100	100	100	100	100	100

Table 4.13: Occupation (18yrs+) \* Ethnicity \* Lifecycles

		Muinane	Uitoto	Other indigenous	Non-indigenous settler	Mestizo	Total N=246
n=		33	53	25	15	9	N=135
18-34 years	Farmer	42	74	80	47	78	64
	Fisherman	12	6	0	27	0	8
	Student	21	9	12	13	0	13
	Shopkeeper	0	2	0	0	0	1
	Housewife	3	4	4	7	11	4
	Employed	3	4	4	0	11	4
	Migrated	18	2	0	7	0	6
		100	100	100	100	100	100
n=		14	29	8	16	4	N=71
35-49 years	Farmer	64	69	63	19	50	55
	Fisherman	7	7	25	19	0	11
	Student	7	0	0	0	0	1
	Shopkeeper	0	7	0	25	0	9
	Housewife	14	0	13	25	25	11
	Employed	0	10	0	13	0	7
	Migrated	7	7	0	0	25	6
		100	100	100	100	100	100
n=		12	14	7	7	0	N=40
50 years and above	Farmer	83	86	71	0	0	68
	Fisherman	8	7	14	43	0	15
	Shopkeeper	0	0	0	14	0	3
	Housewife	0	0	14	14	0	5
	Employed	0	7	0	29	0	8
	Migrated	8	0	0	0	0	3
Total		100	100	100	100	0	100

Table 4.14: Occupation (18yrs+) * Place * Sex								
		Chukik+	Araracuara	Bogota	Pto Santander	Boarding schools	Total	
		N=	23	102	8	1	0	N=134
Male	Farmer	70	58	0	0	0	0	56
	Fisherman	13	20	13	0	0	0	18
	Student	13	8	38	0	0	0	10
	Shopkeeper	0	4	0	0	0	0	3
	Housewife	0	3	0	0	0	0	2
	Employed	4	8	0	0	0	0	7
	Migrated	0	0	50	100	0	0	4
			100	100	100	100	0	100
		n=	17	78	10	2	5	N=112
Female	Farmer	94	72	20	50	33	70	70
	Fisherman	0	1	0	0	0	1	1
	Student	6	1	10	0	33	4	4
	Shopkeeper	0	5	0	0	0	4	4
	Housewife	0	15	0	50	0	12	12
	Employed	0	5	0	0	0	4	4
	Migrated	0	0	70	0	33	7	7
	Total	100	100	100	100	100	100	100

Table 4.15: Occupation (18yrs+) * Life cycles * Sex					
		18-34 years	35-49 years	50 years and above	Total
		n=72	n=36	n=26	N=246
Male	Farmer	56	56	58	56
	Fisherman	15	19	23	18
	Student	18	3	0	10
	Shopkeeper	1	6	4	3
	Housewife	3	3	0	2
	Employed	4	8	12	7
	Migrated	3	6	4	4
	Total	100	100	100	100
		n=63	n=35	n=14	N=112
Female	Farmer	75	54	86	70
	Fisherman	0	3	0	1
	Student	6	0	0	4
	Shopkeeper	0	11	0	4
	Housewife	6	20	14	12
	Employed	3	6	0	4
	Migrated	10	6	0	7
	Total	100	100	100	100

		Table 4.16: Sex * Ethnicity * Life cycles				
		0-17 years	18-34 years	35-49 years	50 years and above	Total
		n=112	n=72	n=36	n=26	N=246
Male	Muinane	23	29	22	31	26
	Uitoto	43	39	36	27	39
	Other indigenous	10	14	17	19	13
	Non-indigenous settler	7	15	22	23	13
	Mestizo	17	3	3	0	9
Total		100	100	100	100	100
		n=132	n=63	n=35	n=14	N=244
Female	Muinane	24	19	17	29	22
	Uitoto	30	40	46	50	36
	Other indigenous	17	24	6	14	17
	Non-indigenous settler	14	6	23	7	13
	Mestizo	16	11	9	0	13
Total		100	100	100	100	100

Table 4.17: Occupation (18yrs+) * Sex			
	Male	Female	Total
n=	134	112	N=246
Farmer	56	70	62
Fisherman	18	1	10
Student	10	4	7
Shopkeeper	3	4	3
Housewife	2	4	7
Employed	7	4	5
Migrated	4	7	5
	100	100	100

### 1. Frequencies at the individual level

<b>Frequencies</b>	<b>N Valid</b>	<b>Missing</b>
AGE97CAT	491	0
ETHNI	491	0
HHNO	489	2
Occupation (18yrs+)	246	245
Place (code)	491	0
SEX	490	1

	<b>Life cycles</b>	<b>Frequency</b>
Valid	0-17 years	245
	18-34 years	135
	35-49 years	71
	50 years and above	40
	Total	491
<b>Total</b>		<b>491</b>

	<b>Ethnicity</b>	<b>Frequency</b>
Valid	Muinane	117
	Uitoto	184
	Other indigenous	73
	Non-indigenous settler	64
	Mestizo	53
	Total	491
<b>Total</b>		<b>491</b>

	<b>Occupation (18yrs+)</b>	<b>Frequency</b>
Valid	Farmer	153
	Fisherman	25
	Student	18
	Shopkeeper	8
	Housewife	16
	Employed	13
	Migrated	13
	<b>Total</b>	<b>246</b>
Missing	Below 18 years of age	245
	<b>Total</b>	<b>245</b>
<b>Total</b>		<b>491</b>

	<b>Place</b>	<b>Frequency</b>
Valid	Chukik+	73
	Araracuara	383
	Bogota	26
	Pto Santander	3
	Boarding schools	6
	<b>Total</b>	<b>491</b>
<b>Total</b>		<b>491</b>

	<b>Sex</b>	<b>Frequency</b>
Valid	Male	246
	Female	244
	<b>Total</b>	<b>490</b>
Missing	System Missing	1
	<b>Total</b>	<b>1</b>
<b>Total</b>		<b>491</b>

## 2. Frequencies at the household level

Frequencies	N Valid	Missing
Household ethnicity	77	0
Farmer	77	0
Fisher	77	0
Student	77	0
Shopkeeper	77	0
Housewife	77	0
Employed mm	77	0
Migrated	77	0
Place of first person mentioned	77	0

	Household ethnicity	Frequency
Valid	Indigenous	46
	Non-indigenous	15
	Mixed	16
	Total	77
Total		77

	Occupation	Frequency
	Farmer	62
	Fisher	23
	Student	10
	Shopkeeper	6
	Housewife	14
	Employed mm	13
	Migrated	7

Each value indicates number of households out of a total of 77

	Place of first person mentioned	Frequency
Valid	Chukik+	12
	Araracuara	64
	Bogota	1
Total		77





## **ANNEX 5**

### **TRANSLATION FROM SPANISH OF WORDS SPOKEN BY AURELIO SUAREZ, BELISARIO CASTRO, JUANA SUAREZ, AND BELISARIO CASTRO REALPE, AND THE TEXT OF THE NARRATION IN THE FILM, “THE DANCE WITH THE FRUITS OF THE EARTH” (KRONIK AND KRØYER 2001)**

(The numbers in parentheses refer to the time codes in the film.)

#### **Aurelio Suarez:**

We know that at first there was nothing (00:02:18:19 00:02:25:06)

There was only Creation.

Then came the Creation of the Earth, the trees - (00:02:28:00 00:02:32:10)

- the animals, space, and the air. (00:02:32:14 00:02:36:04)

After this Man was created. (00:02:38:15 00:02:43:08)

Humanity is symbolized in four colours. (00:02:44:24 00:02:49:17)

The dark colour is like - (00:02:49:21 00:02:52:14)

- when we are inside our mother. (00:02:52:18 00:02:56:03)

The white colour is when we are born and make ourselves be seen. (00:02:56:07  
00:03:00:02)

The green part is nature, tobacco, and coca. (00:03:00:06 00:03:07:04)

The colour of blood is the political part – (00:03:07:08 00:03:11:12)

- in which we learn of the sun and the universe. (00:03:11:16 00:03:17:14)

#### **Narrator:**

The People of the Centre of the Earth: This is what the Muinane and Uitoto Indians from Colombia’s rainforest call themselves.

For generations, these Indians have carried out and lived in accordance with their own educational system, in which riddles and their solutions are a central element.

When they start their education, the Indians build a longhouse, a Maloca, which functions as a base for the duration of the 5 to 10 year process. The Indians consider the Maloca to be their university.

Belisario is the owner of a Maloca. He is educating himself to be a master of the Dance of the Fruits. This education will qualify him to be a leader and advisor for his people.

His studies take the form of a long series of examinations that consist of dances and songs containing riddles.

Belisario is preparing for his next dance.

Aurelio is Belisario’s advisor. He is also in the process of educating himself as a traditional medicine man.

**Aurelio Suarez:**

Education is about improving this knowledge and the skills each child is born with. (00:04:53:23 00:04:59:00)

You eat a fruit - but inside there is a seed. (00:04:59:04 00:05:04:00)

In the same way, the child is born with its light, with its wisdom – (00:05:04:04 00:05:09:00)

- but the child does not know what to use its knowledge for. (00:05:09:04 00:05:13:04)

While it grows up, the child will find out. (00:05:13:08 00:05:17:06)

It will discover what attitude is about – (00:05:17:10 00:05:20:21)

- and that attitude later can be developed into self-determination and maybe even leadership. (00:05:21:00 00:05:25:13)

**Narrator:**

A dance is often arranged in connection with some current problem that influences the lives of the Indians and which they are trying to solve. Such a problem could be an illness, a poor harvest, or internal conflicts.

Belisario takes his son with him upstream to discuss the impending dance with his uncle, Mariano.

**Belisario Castro:**

My uncle - (00:05:51:10 00:05:54:13)

- and before him my grandfathers – (00:05:54:17 00:05:58:02)

- have both completed the process - (00:05:58:06 00:06:01:17)

- we refer to as “The Dance of Fruits”. (00:06:01:21 00:06:05:09)

He is now my advisor. (00:06:07:05 00:06:10:11)

To complete this (00:06:10:15 00:06:16:24) grand and special process -

- you have to seat yourself beside your advisor – (00:06:17:03 00:06:22:07)

- to ask him questions about difficult aspects - (00:06:22:11 00:06:28:24)

- and to advance in the process. (00:06:29:03 00:06:33:16)

**Aurelio Suarez**

In relation to the first part of the education - (00:06:41:02 00:06:47:07)

- you have to pay attention to the soft spot of the child. (00:06:47:11 00:06:51:12)

The child is born with a soft spot right here. (00:06:51:16 00:06:54:14)

During this period you have to bath the child, and talk to it. (00:06:54:18 00:06:59:02)

To ensure the healthy growth of the child, you must speak a lot from the centre of the *maloca* [the *mambeadero*]. (00:06:59:06 00:07:04:19)

The child receives all its knowledge and wisdom - (00:07:04:23 00:07:10:17)

- during the period until this soft spot has hardened. Then the child sits up. (00:07:10:21 00:07:16:10)

The child can now get up on its own - (00:07:16:14 00:07:19:22)

- and it starts saying “gu gu gu”. (00:07:20:01 00:07:24:22)

This is the beginning.

**Narrator:**

The Spanish word *adivinar* means both to guess riddles and to seek the truth. For the Indians, life is full of riddles; life itself is a riddle; and riddles demand answers.

One must use all one's knowledge and energy to find the right solutions. Thus, riddles are used as a central part of the education. The answer to a riddle never has only one meaning. Its meaning is influenced by qualities residing in both the one who poses the riddle and the one who answers it, and by history, the actual situation, and the future.

The knowledge Belisario is acquiring through his education is therefore not static. It is constantly developing through a long process, from generation to generation. Belisario and his uncle talk together all night about the actual problems that exist among their people, and they decide that the time is right to arrange the next dance.

**Belisario Castro:**

We have just been upstream (the Caquetá River) to visit – (00:09:04:20  
00:09:09:05)

- the place of our cradle (*Chukik+*). (00:09:09:09 00:09:13:03)

My cradle and the cradle of my people. (00:09:13:07 00:09:19:18)

From there, we have come - (00:09:19:22 00:09:23:19)

- and from there, we have arrived here - (00:09:23:23 00:09:28:18)

- where we are now [Araracuara]. (00:09:28:22 00:09:32:18)

We are now going to initiate a ceremonial work. (00:09:32:22 00:09:40:10)

It is a huge endeavour – (00:09:40:14 00:09:46:21)

- and we shall do it well. (00:09:47:00 00:09:52:24)

[For this sake] We have [sessions of] dialogue every night – (00:09:55:06  
00:09:59:23)

- explanations, narratives. (00:10:00:02 00:10:04:04)

Altogether, an intellectual type of job. (00:10:04:08 00:10:08:13)

**Narrator:**

In addition to the nightly studies of songs and riddles, practical preparations must also be organized.

Several hundred guests must be invited, all of whom must be fed with *maniok* bread and meat. It is also Belisario's responsibility to ensure enough coca leaves and *ambil*, which is a tobacco extract, for everyone.

Belisario has chosen a group of helpers. Their task is to support Belisario in both the intellectual and the practical work. It is Belisario's task to educate them as potential leaders.

Four of the helpers are assigned the task of hunting tapir. They will be away on the hunt for six days.

**Aurelio Suarez:**

There are two phases, day and night. (00:10:51:07 00:10:53:23)

At night, the child sleeps. (00:10:54:02 00:10:56:16)

At this time, the father speaks to the child. (00:10:56:20 00:11:00:00)

During daytime, it is distracted by the wind and the birds. (00:11:00:04 00:11:03:20)

During nighttime, you may instruct the child spiritually. (00:11:03:24 00:11:08:21)

This is the man's domain. (00:11:09:00 00:11:12:17)

The woman sleeps. (00:11:12:21 00:11:15:21)

During the daytime, she provides her part of the formation – (00:11:16:00 00:11:19:22)

- by bringing the child with her to the forest-field, to bath etc. (00:11:20:01 00:11:24:01)

You have to be aware that the child records everything. (00:11:24:05 00:11:29:02)

The child records all that it hears in its mind. It is like a tape recorder. (00:11:29:06 00:11:33:24)

Therefore, it is important – (00:11:34:03 00:11:37:12)

- never to say vulgarities near a child. It records everything. (00:11:37:16 00:11:42:14)

**Narrator:**

The *maniok* root is the Indians' basic food and can be used to bake bread. It is cultivated on small fields that are cleared in the rain forest.

Belisario and his helpers have decided that the subject of the dance and the riddles shall be *maniok* and pineapple: where they come from, how they are cultivated, and how they can be used.

All the guests who attend the dance will bring with them shoots and seeds from their best specimens of these two plants. After the dance, Belisario and his helpers will plant and cultivate them according to the knowledge gained from the dance and the solutions to the riddles. In this way, they create a so-called complete *in situ* gene bank consisting of the best plants in the area. After that, the Indians can come to Belisario to acquire new shoots and seeds for their fields.

Juana is Belisario's mother and one of the most energetic participants in the practical work.

**Juana Suarez**

I have taught myself, for this is how my mother raised me. (00:13:17:01 00:13:21:01)

We get up very early. Get dressed and arrange our hair. (00:13:21:05 00:13:26:09)

Then we start processing the dough and making the cassava breads. (00:13:26:13 00:13:31:17)

We place a few breads in the centre of the *maloca*. (00:13:31:21 00:13:35:18)

Then the guests and the helpers arrive. They need food. (00:13:35:22 00:13:41:21)

It is like that everyday during the time of preparations. (00:13:42:00 00:13:46:01)

Some days, I feel I just cannot do it anymore. (00:13:46:05 00:13:49:02)  
 But then I say, "Yes, I can. (00:13:49:06 00:13:52:05)  
 Tomorrow, we will go up [to the forest field] and get more cassava roots -  
 (00:13:52:09 00:13:56:03  
 - because there is still not enough [for the guests] to eat." (00:13:56:07  
 00:13:59:09)  
 During the cold season, I get up very early. (00:14:10:10 00:14:16:17)  
 Then I bath like this, with the hands. (00:14:16:21 00:14:21:00)  
 This is how you bath. 00:14:25:19 00:14:32:15  
 3 o'clock in the morning you must bath, for it gives strength. (00:14:32:19  
 00:14:35:11)  
 I do not use coca. I only suck *ambil*. Just as you smoke. (00:14:38:10  
 00:14:43:02)  
 I have my *ambil* sometimes. I have to suck my *ambil*. Then, I live. (00:14:43:06  
 00:14:49:05)  
 I suck *ambil*, because it gives me strength. 00:14:49:09 00:14:53:16  
 I suck, and I bring a little food with me. (00:14:53:20 00:14:57:21)  
 That is better for me. (00:14:58:00 00:15:00:24)  
 I do not get tired. (00:15:01:03 00:15:04:12)  
 I do not buy new shoes, because my son is studying. (00:15:06:24 00:15:10:15)  
 He is getting the opportunity to become somebody. (00:15:10:19 00:15:13:16)  
 It is important that he finishes his study - (00:15:13:20 00:15:17:03)  
 - because it has had great costs. (00:15:17:07 00:15:20:24)  
 My daughters do not wish to study. That is fine with me. (00:15:21:03  
 00:15:25:01)  
 They stay here and work - (00:15:25:05 00:15:28:23)  
 - in the field with us. That is best for me. (00:15:29:02 00:15:34:19)  
 Many young people who study, do not use it. (00:15:34:23 00:15:40:06)  
 So says Belisario. Belisario has studied - (00:15:40:10 00:15:45:15)  
 - but now he studies here. (00:15:45:19 00:15:52:02)  
 Our culture. (00:15:52:06 00:15:54:13)  
 And the young who studied at the same time as Belisario, where are they now?  
 (00:15:54:17 00:15:59:20)  
 They study and study - and then they stay in Bogotá. (00:15:59:24 00:16:05:00)  
 By now, they may have become doctors. (00:16:05:04 00:16:08:11)  
 When people from here finish studying - (00:16:08:15 00:16:13:16)  
 - they leave and never come back. (00:16:13:20 00:16:17:19)  
 I have great expectations for my son, Belisario. (00:16:17:23 00:16:23:03)  
 He cannot leave here. (00:16:23:07 00:16:27:15)  
 I do not think he will go anywhere. (00:16:27:19 00:16:31:22)  
 Certainly, he has not said that he will leave. (00:16:32:01 00:16:35:18)  
 I dare trust my future with him. (00:16:35:22 00:16:41:23)  
 Everybody tells me the same.

He is never vulgar. He never yells. (00:16:42:02 00:16:46:03)

No, never. He is a very good son. (00:16:46:07 00:16:52:10)

**Narrator:**

Coca and tobacco are used to make an extract called *ambil*. These are two important ingredients in the life of the Indians and important elements in their education. These two substances together create openness, concentration, and endurance.

Coca is cultivated on fields in the forest. The leaves are harvested, dried, crushed, and sifted together with the ashes of *yarumo* leaves. Taking coca is called to *mambi*. Coca is only taken by the men in the middle of the *maloca*. Here, they gather together at night to analyse, coordinate, and make decisions.

Coca is therefore a central part of their culture; but coca is misused by others to produce cocaine. This form of production, the fight against it, and the wars this has caused in Colombia constitute the greatest threat to Indian culture.

**Belisario Castro:**

The coca is a human being. (00:17:54:00 00:17:58:22)

When this human being feels it is being exploited - (00:17:59:01 00:18:07:05)

- it turns into war. (00:18:07:09 00:18:11:24)

We are trying – (00:18:12:03 00:18:15:19)

- to control the situation. (00:18:15:23 00:18:18:21)

We meet among different *maloca*-owners to ensure – (00:18:19:00 00:18:26:23)

- that it will not affect us badly. (00:18:27:02 00:18:31:08)

Because we are not the ones taking the process off track. (00:18:31:12 00:18:36:22)

It is the other society – (00:18:37:01 00:18:40:11)

- that exists in our country. This is where the problem is. (00:18:40:15 00:18:46:13)

**Narrator:**

*Ambil* is a nicotine mass extracted from tobacco and mixed with vegetable salt.

The Indians say that the possession of *ambil* has the same significance for them as money has for us, not as a means of exchange but as a status symbol.

**Aurelio Suarez:**

The knowledge, the attitude, and the personality of the child - (00:19:09:07 00:19:14:01)

- one has to lead, to form – (00:19:14:05 00:19:18:08)

- and you have to make the child aware of the skills it possesses (00:19:18:12 00:19:23:01)

The child will always use its ability to ask questions. (00:19:23:05 00:19:27:14)

For example: “What is this noise?” Even if nobody says so, the child is born with this ability.

(00:19:27:18 00:19:32:23)

You have to organize, to make fit, and to correct – (00:19:33:02 00:19:37:21)

- in ways so that the child finds out what it may and may not. (00:19:38:00 00:19:41:19)

This is about respect. (00:19:41:23 00:19:44:09)

This is what I call *formacion* [upbringing]. This is upbringing. (00:19:44:13 00:19:48:11)

Before we talked about education. (00:19:48:15 00:19:51:17)

This is upbringing. From here, you may begin the education. (00:19:51:21 00:19:57:08)

**Narrator:**

Belisario's son is 13 years old and is named after his father.

**Belisario Castro Realpe (Belisarios son):**

Aurelio can predict - (00:20:07:10 00:20:10:09)

- what is going to happen. (00:20:10:13 00:20:14:02)

He can warn about things that you have to be cautious about. (00:20:14:06 00:20:19:10)

Sometimes he knows, if someone is about to die - (00:20:19:14 00:20:25:14)

- or if someone will be bitten by a snake. (00:20:25:18 00:20:29:23)

He can predict what will happen to a person. (00:20:30:02 00:20:35:09)

You have to be 21 years old in order to *mambe*. (00:20:42:19 00:20:47:05)

I do not *mambe*. I am too small. (00:20:47:09 00:20:52:00)

I am too young to start *mambeing* - (00:20:52:04 00:20:58:15)

- and to listen to what they say and talk about. (00:20:58:19 00:21:03:21)

But coca is not something to fool around with - (00:21:04:00 00:21:09:03)

- because it can make you sick.. (00:21:09:07 00:21:14:11)

I would like to learn from my father - (00:21:26:21 00:21:29:21)

- everything he knows - (00:21:30:00 00:21:34:17)

- and to celebrate dances as he does. (00:21:34:21 00:21:37:16)

But I would also like to study, because that is important - (00:21:37:20 00:21:41:12)

- to become a teacher or something like that - (00:21:41:16 00:21:46:07)

A leader, maybe - (00:21:46:11 00:21:49:07)

- everything. (00:21:49:11 00:21:52:09)

But you cannot do both at the same time. (00:21:52:13 00:21:58:15)

I must choose - (00:21:58:19 00:22:01:02)

- if I will study - (00:22:01:06 00:22:05:20)

- or follow in my father's footsteps. (00:22:05:24 00:22:10:06)

That, I have not decided yet. (00:22:10:10 00:22:14:15)

I do not believe in other gods. (00:22:21:21 00:22:24:11)

Only in one God. (00:22:24:15 00:22:27:09)



He is the one, the teacher knows a lot about. (00:22:27:13 00:22:34:00)

The men who *mambe* believe in God. (00:22:35:04 00:22:40:21)

This God is in the *ambil* and in the coca. (00:22:41:00 00:22:45:17)

For me, it is the same God. (00:22:48:01 00:22:51:20)

### **Aurelio:**

To pass on and to use your knowledge as a teacher - (00:23:25:17 00:23:31:12)

- it is imperative - (00:23:31:16 00:23:34:03)

- that the teacher educates himself. (00:23:34:07 00:23:38:06)

Why? (00:23:38:10 00:23:40:11)

If I have a bad habit - (00:23:40:15 00:23:45:09)

- some kind of bad habit - (00:23:45:13 00:23:50:00)

- and I teach, then my pupils will inherit this bad habit. (00:23:50:04 00:23:55:04)

Therefore, we say that even if a child is naughty - (00:23:55:08 00:24:01:01)

- bad mannered, or moody - (00:24:01:05 00:24:05:08)

- the teacher must not fail. (00:24:05:12 00:24:09:02)

He knows which advice he should give. (00:24:09:06 00:24:13:23)

The education he passes on to the child, the teacher has acquired himself.

(00:24:14:02 00:24:19:18)

Naturally, the child is not to educate itself. (00:24:19:22 00:24:25:09)

But the attitude and philosophy of the teacher is what he passes on to the child

(00:24:25:13 00:24:28:23)

When we evaluate the education - (00:24:29:02 00:24:34:02)

- the way we do here - (00:24:34:06 00:24:36:14)

- we hardly evaluate the pupil. It is the teacher, who is evaluated. (00:24:36:18

00:24:41:16)

Here, the teacher is not allowed to fail. (00:24:41:20 00:24:46:18)

The teacher may never say: "This child cannot learn." (00:24:46:22 00:24:52:07)

These words he must never utter. (00:24:52:11 00:24:55:16)

The teacher may never say that the pupil is dumb and does not know anything -

(00:24:55:20 00:25:00:07)

- for it is he who is the teacher! (00:25:00:11 00:25:03:01)

### **Narrator:**

The hunters return with three large tapirs, 450 kilos of meat.

The practical preparations are concluded and everyone looks forward to a good dance. Now, only the last nightly discussion about the dance, the songs, and the riddles remains to take place.

The appointed riddler is in another place together with his helpers to formulate the riddles.

The fruits and knowledge about the fruits as subjects in this education serve as a means to develop the actual skills that Belisario is to master.

His most important goal is to learn to listen – to his surroundings, to the people, the animals, and to nature.

He must learn to analyse and coordinate in order to make decisions and carry them out in practice.

These are the skills he acquires through the preparations and performance of the dance.

When he masters these abilities and the ability to solve riddles, he can rightfully call himself a leader and advisor for the people around him.

By inviting people to a dance, one attracts the attention of one's surroundings. Belisario thus places himself in the centre. If he is well prepared, the dance will be a success. The success will make him strong, and this strength will enable him and his helpers to then find the right solutions to their current problems.

Belisario does not eat or sleep for 24 hours before the start of the dance. In this way, he achieves total openness and concentration on the dance and the riddles.

But by placing himself in the centre of attention and opening himself completely, he also becomes vulnerable to evil forces. Therefore, the last night Belisario protects himself and his family by painting himself as a jaguar.

At four o'clock, the first guests, the riddler and his helpers, arrive.

The dance begins.

The song contains hints about the riddle Belisario and his helpers must solve.

If their solution is not satisfactory, the dance and song continue with more hints. When the riddle is solved, the next dance begins.

The dance and the riddles alternate for three to four hours. After that, the people dance until morning.

Belisario has led a good dance, and life in the Maloca now continues toward the next in the series of dances, which together will make him a master and a leader.



## **ANNEX 6**

### **ENGLISH ABSTRACTS OF A THEMATIC ISSUE OF THE DANISH LANGUAGE JOURNAL, *DEN NY VERDEN* [THE NEW WORLD]**

#### **The New World 99:4**

#### **(12) Recent articles in Danish by the Forest Group and invited researchers and natural scientists.**

Kronik, Jakob and Stig Jensen, eds. 1999. *Tropical Forests – Between Felling and Conservation*, p. 1-182, in Danish, *Den Ny Verden*, vol 4, Centre for Development Research, Copenhagen

#### **First key question**

Can tropical forests be managed in such a way that an interest in utilization and protection can be integrated?

- Hypothesis 1. The development of knowledge that can ensure both utilization and conservation of tropical forests is dependent on the context in which it shall function, including the social, cultural, and natural conditions.
- Hypothesis 2. Effective forest management implies institutional arrangements and decision structures based on all interested parties.
- Hypothesis 3. Clarified ownership and user rights to forest land are central for successful regulating initiatives/implementation of policies applicable to forests.

#### **Second key question**

How much importance should be attached to the fact that the richest forests are often found in the poorest world countries?

- Hypothesis 4. Poverty is a decisive hindrance to sustainable forestry and a main factor in the explanation of the conversion of forests to other utilization.
- Hypothesis 5. Pressure on forests and the land they cover is increased gradually with economic growth, higher population density, and an increased specialization in the production systems.
- Hypothesis 6. The costs of tropical forest conservation (and consequently of under-utilization of certain agricultural and forestry products) are often met locally and nationally, whereas the force behind conservation is often international.

## **ABSTRACTS IN ENGLISH**

Stig Jensen and Jakob Kronik:

### **To See the Forest for Trees - Central Hypotheses concerning the Contested Forest.**

The article gives a broad introduction to the main problematics on the management of tropical forests. Drawing on recent insights from social and natural sciences, the editors of this volume argue for a need to revisit the debate of priority setting based on a re-evaluation of common lines of tension, such as utilization vs. conservation and resource degradation vs. poverty or economic growth.

Jakob Kronik

### **To learn is to live - Institutionalizing Knowledge of Biological Diversity**

It has long been recognized that local ethnic groups' knowledge of the rain forest is essential locally and globally, not least for health and nutrition. It has furthermore been recognized, though hesitantly, that this knowledge is an integral part of the creation and maintenance of local 'traditional' forms of life. The article illustrates this relationship between lifestyle and knowledge of biodiversity in an area of Columbia's Amazonian rain forest with a very high biological diversity and characterized by very different livelihood strategies. Furthermore, it is argued that the forest is not just threatened through the conversion into agricultural land, but also the multi-faceted pressure exerted on cultural institutions, livelihood strategies, and knowledges by the meeting with the market.

Jon Fjeldså and Carsten Rahbek

### **When the forest matters**

The biodiversity of tropical forests is very unevenly distributed, and the resilience of local flora and fauna to human interventions also varies. The article argues that if biodiversity is to be conserved, there is a need for further insight into such matters. However, the effort can be extremely precise and effective.

Thomas Fogh Mortensen

### **Local under-utilization of the forest**

With the emphasis of this article on the under-utilization of forests, a relatively new subject within natural resource management is addressed. Empirical research suggests that part of the forest areas that are managed within the framework of the 'Community Forestry' programme in Nepal are under-utilized by the local groups of forest users. The article aims to explain why groups of forest users choose to practice very restrictive management plans, even if they have the user rights to the forest and the interest in utilizing the forest to meet local demands.

Finn Danielsen and Martin Enghoff

### **Nature reserves – between utilization and protection**

In recent years, management of nature reserves in developing countries has been strengthened. Nevertheless, few reserves in Southeast Asia live up to their objectives. The main reason is the lack of consideration of the limited economic,

institutional, and professional resources in the related countries. Furthermore, it is difficult to define the role of the local population and to translate this into operational terms. The article summarizes experiences from donor-financed projects involving management plans, nature surveillance, biological and socio-economic research, and creation of alternative income-generating activities.

Stig Jensen

**Management in a forest of interests**

Forests are disappearing and species are becoming extinct. The reason is the growth of human population. Or is it? The developing countries, endowed with rich natural resources, are exposed to international pressure to do something about their flora and fauna conservation, particularly the forest conservation. Zimbabwe has come some way in this course, and many consider Zimbabwe as a showcase for natural resource management in developing countries. In the eastern part of Zimbabwe, forest areas of international significance can be identified. The article challenges the nature debate, presents the players, and makes an appraisal of the actual conflicts in this part of Zimbabwe. Finally, the article proposes initiatives to be taken to promote the management of forest resources in developing countries to unify both utilization and protection purposes.

Thorkil Casse

**Rational thinking or pure chance?**

The article discusses forest clearing in a corner of Madagascar. In areas where the forest has disappeared completely, peasants' livelihoods have not improved in the long term, and now the natural resource foundation has gone. In the short term, no doubt, there are income opportunities in converting forestland into maize production. It is therefore difficult to point to alternatives. A tax on maize production could be one option, but presumably not an adequate solution to halt the fast spreading forest clearings in Madagascar.

Jan Ole Haagenen

**Forest, population growth, and poverty**

When development research concerns forest management, we are often presented with perceptions relating the extension and content of forests with poverty and population growth. New-institutional theory moderates this automatic relationship, since institutions can have a major influence. However, new-institutional theory is inadequate if we want to reach a better understanding of why some areas are covered with forest and others not. The article looks at the relationships between forests, poverty, and population growth using data from central India.

Sven Wunder

**Why are tropical forests disappearing?**

The article analyses what features of interface between economy, development models, and natural resource management were decisive for the considerable deforestation in Brazil, Ecuador, and Venezuela that took place during certain historical stages. At other times in history, the forest cover in the three countries remained constant. It is concluded that increased trade, economic expansion, and

deforestation are correlated, and that in many cases the conversion of forest was a financially rational response to the presence of abundant and easily accessible forest resources. Furthermore, the relevance of the conclusions is discussed in relation to other countries, both within and outside Latin America. The option of compensating tropical countries for their global forest services is assessed in a final comment.

Gustav Nebel

#### **Close-to-nature forestry in tropical forests**

The article examines whether close-to-nature forestry is applicable in the management of tropical rain forests. It deals with selection felling, an intervention similar to the evolution that follows naturally when trees in the forest die of age or of other natural causes. It is concluded that this management system safeguards various interests, but economic, technical, and organisational problems remain unsolved.

Søren Gram

#### **Indigenous peoples between development and protection**

The article describes experiences from projects which support local utilization of fruit, honey, timber, and other products from tropical forests. Development organisations have tried to integrate the conservation of biodiversity with sustainable development for the people living off the forest. It is not so easy though to combine the organisations' objectives for nature conservation with local needs. Indigenous peoples' culture and political systems do not always fit well into donor scenarios.

Lars Dinesen

#### **Centralized or decentralized forest management systems?**

Based on fieldwork in various Asian countries and Tanzania, numerous options for conservation are discussed. Management of forests by central governments in Asian countries was ineffective. At present, a decentralised management system is on the agenda, involving all user groups, to work towards a more sustainable management of forest resources. The striving for application of decentralized management systems of resources is supported, as well as attempts to implement overall national strategies. It is furthermore emphasised that it is necessary to distinguish between different types of forest and to reach appropriate compromises between utilization and conservation. A precautionary principle should furthermore be applied in forests that endow unique biodiversity.

**LIVING KNOWLEDGE**  
**- Institutionalizing learning practices about biodiversity among  
the Muinane and the Uitoto in the Colombian Amazon**

**Summary of Ph.D. Dissertation**

**by *Jakob Kronik***

**Submitted to the Institute of Environment, Technology and Social Studies,  
Roskilde University, as partial fulfilment of the requirements for the PhD  
degree**

**Supervisors:**  
**Kirsten Brandsholm Pedersen, Roskilde University**  
**Jannik Boesen, Centre for Development Research, Copenhagen**

**April 2001**



It is claimed that about three-quarters of all major medicinal plants in international commerce are used in ways first devised by folk doctors and shamans at their place of original collection (Hecht and Cockburn 1989). Although estimates vary concerning the role of indigenous peoples in the search for potential sources of new medicines, most agree that it is important, both for sustaining their own livelihoods and for global health. Some propose that traditional knowledge increases the efficiency of screening plants for medicinal purposes by more than 400 percent, while others estimate that bio-prospectors can increase trials from one in 10,000 to one in two, by consulting indigenous peoples (Pradesh 1999). Another, rather famous example of the value of indigenous knowledge concerns the climatic knowledge of the Masai pastoralists, which has enabled them to foresee and act upon major droughts long before researchers and officials who employ modern state-of-the-art remote sensing technology (Moris and Copestake 1993). Such examples are very impressive, but how can it be that indigenous peoples know so much about the environment they inhabit? How do they learn, and on what does their learning depend? It is questions like these that sparked my interest in undertaking the research leading to this dissertation.

The literature explaining the extent and character of this type of knowledge falls largely into two fields. Most authors agree that the creation and extent of this knowledge is related to people's productive activities and their location. However, some authors take it a step further. They argue that place and human action do not fully explain how knowledge is generated and, not least, maintained. People's cultural models provide the framework for their learning experiences. These are then reflected upon and tried out within culturally shaped institutions and form a basis for their productive and reproductive strategies and practices. This dissertation explores both viewpoints.

However, it is also well known that the contexts within which this knowledge is produced and maintained are under pressure in large parts of the world. The continuous expansion of the agricultural frontier into forest areas is only one of many points of contact between modern and other ways of life and production. The question is how indigenous knowledge systems are affected along processes of societal and technological change.

This study addresses the production and reproduction of indigenous peoples' knowledge systems, particularly when they are related to biological diversity. The conceptual concern is the relationship between the generation, maintenance and change of such bodies and systems of knowledge and livelihood strategies. The main analyses are based on a total of seven months of fieldwork<sup>1</sup> in Colombia among the Muinane and Uitoto peoples of Northwestern Amazon. My aim is to feed into the on-going political struggle concerning rights of access to and use and conservation of biological diversity and associated knowledge, by contributing to the understanding of the relationship between living and knowing.

What are the political potentials of this knowledge and thus of the livelihoods of indigenous peoples? Several processes since the mid-1980s have placed the resolution of the conflicts regarding biological diversity on the global agenda. The most important processes were driven, on one hand, by the increased knowledge of and concern with environmental destruction, and the awareness among large NGOs and intergovernmental bodies of their failure to counter this destruction effectively. On the other hand, the development of new technologies that enabled relatively fast screening procedures of potentially valuable biological elements increased the

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<sup>1</sup> Periods of 2-6 weeks spread over the agricultural year between May 1995 and March 1998.

interest of industry and governments. Also, strengthened organisations for indigenous peoples from, among other places, Latin America and Greenland, have to some degree managed to draw the attention of international fora to the local conditions upon which the conservation of biodiversity and the development of associated knowledge rely. By stressing the importance of the link between their livelihood strategies and their ancestral knowledge systems and pointing out its positive effect on past, present, and future use and conservation of biodiversity, indigenous peoples' organisations have demonstrated their ability to engage in cultural politics. My study is motivated by two main concerns:

*First*, indigenous peoples' struggle depends largely upon their knowledge of plants and their continued access to biological diversity.

*Second*, tropical biological diversity and its conservation relate to indigenous peoples' livelihood strategies and their development.

Thus, in this study I examine how is indigenous peoples' knowledge related to livelihood strategies, cultural practices and territory, and analyse how indigenous peoples' knowledge on biodiversity is related to place and culture. This involves a research interest in how knowledge production is affected when place and culture are under stress.

The dissertation is organised as follows:

In the first chapter, I introduce the reader to the complex and contested field of biodiversity. The aim is to understand the socio-political landscape in which indigenous peoples' organisations move, and the actual and potential role of their knowledge in global strategies for the conservation and use of biodiversity. The major actors and negotiating fora are presented to illustrate and analyse the contradictions and diverging interests, their discourses and power. This is followed by a discussion of the motives for merging these and the development of new strategic alliances. The analysis of the political setting produces questions of an empirical and conceptual nature concerning the relevance of the ways in which knowledge and knowledge production are commonly seen; of the importance of social and cultural dimensions for the production of knowledge; and of knowledge-producing systems' resilience under massive social changes.

In the second chapter, I am concerned with ways of understanding and dealing with the conceptual questions concerning the dynamic character of knowledge production in relation to biological diversity and the linkages to social, cultural, political and biophysical dimensions of context. The chapter falls in two parts:

In the first part, I examine a debate that has contributed substantially to the way we understand knowledge production today, not least concerning biological diversity. The debate has resulted in the construction and politicisation of a body of 'non-scientific' knowledge.

The analysis departs from a critique of the positivist notion of knowledge production as objective, universal, and free of influence from special interests, and continues by discussing the arguments and motives of the authors and practitioners who propose the division between local and scientific knowledge and its making.

In the second part of the chapter, I focus on central aspects of the contextual character of the making and keeping of knowledge. Knowledge production depends upon sets of knowledge processes. I set out by drawing on discussions of both mental and relational processes, with a

particular focus on reflection, negotiation, and interaction. The analysis of central processes leading to the production of knowledge is taken further by exploring the relevance and character of so-called knowledge institutions, seen as frameworks of shared meanings institutionalising, promoting, and refining learning processes and capacities.

A five-step research strategy is developed in chapter three. A set of research techniques inspired by constructionist inquiry, geographical mapping, and ethno-biological methodology are employed and developed to understand, deconstruct and correlate social, cultural and biological dimensions of the production of knowledge on biological diversity.

Chapters four and five are the empirical accounts. In chapter four, I address how biophysical conditions and the social organisation of production contribute to the shaping of people's knowledge on biological diversity.

In chapter five, I focus on the culture-specific processes of "evacuating" knowledge among the Muinane and Uitoto people, and explore the relevance of people's participation in cultural institutions for the social distribution of knowledge on plant diversity.

In chapter six I step back and draw overall conceptual and political conclusions concerning the relationship between the making of indigenous people's knowledge on biological diversity and the ways in which people live. The following I have collected some of the more important conclusions.

One of the first associations that come to people's mind when discussing the subject of indigenous peoples' valuable knowledge on plants – such as medicinal knowledge – is that it is threatened, and maybe even in a process of decay. This study illustrates that it is not so straightforward. I do not mean to imply that indigenous peoples' knowledge on biodiversity is not under severe pressure – many contemporary and historical examples indicate that it is and has been. However, there are currently other forces stimulating and strengthening the making of indigenous peoples' knowledge.

The contemporary view of local knowledge production on biological diversity places great emphasis in its relation to context. However, context is often rather narrowly limited to human interaction with nature, primarily material production. Knowledge is thus viewed as the results of experiences gained accidentally through 'trial and error' or 'learning by doing' in daily dealings with nature, i.e. agricultural production or other uses of natural resources such as hunting, fishing, construction etc. Based on this understanding it has been argued that the 'closer' a group of people is and has been to nature, the less disturbing contact with outside knowledge systems it has had, the more they will know about nature. However, considering such knowledge processes to be the most important, without understanding the cultural framework of which they are part, has contributed to the idea that indigenous peoples' knowledge of plants consists of a vast body of unconnected and incidental facts. It is also supposed that when these more or less undisturbed communities and the nature with which they interact, are put under pressure, then this knowledge is soon forgotten.

I too initiated my research on the basis of this understanding. However, I soon came to wonder how these bodies of knowledge have been and are developed and maintained, and why, so little research seems to explore and analyse relevant local knowledge processes and mechanisms

concerning biodiversity, with the exception of very few ethnographies. It is not that there has been a lack of phenomena to study. Indigenous peoples' have not only developed impressive folk taxonomies and invaluable technologies such as pottery making, weaving, and agriculture. They have also achieved these rich domains and skills, and not least maintained them, over time, which surely requires highly developed knowledge processes and social mechanisms.

Cultural institutions in Araracuara do not seem to be under severe threat despite the dramatic historical events of violence and social pressure in the region. Rather, there are signs of reconstruction of vital elements of the institutions there. Currently, several processes of political engagement are contributing to this reconstruction. Indigenous authorities have initiated activities directed towards the defence and development of living conditions through cultural as well as and modern institutions. There is an ongoing struggle for land in the region. During the last decade, the Colombian government has handed over more land to indigenous people than any other government in the world. These actions are based on the legislation achieved under the new Constitution of 1991, which is explicit on indigenous peoples' rights to own and manage ancestral areas. The indigenous involved in the area engage in and employ the rhetoric of diverse types of debates, which contribute positively to the resolution of some of their problems: First, the above-mentioned national debate on indigenous identity and rights; second, the international and national debates on biodiversity that claim that biodiversity is valuable, threatened, and that indigenous people have valuable insights. Thirdly, the indigenous actors engage in ritual narratives and dialogues on the management of nature.

In Araracuara, I discovered that the ways people choose to live, with respect to their orientation toward their material production and their inter- and intra-cultural relations, correlates with the knowledge they express concerning biological diversity. This finding points rather overwhelmingly to the importance of the social and not least cultural organisation of material production and reproduction for the knowledge different segments of the population express, concerning the usefulness and visual characteristics of the highly diverse plant group of palms. The common understanding that there is a positive correspondence between the degree of practical interaction with natural resources in a place, and the existing knowledge of related biodiversity, is supported by my results. Women on average know more about agricultural production and food processing, and men know more about plants of the closed forests. The explanation is simple. This corresponds to the general principles of the organisation of material production and reproduction, namely that women are largely responsible for food production, and men for extractive activities in the lesser cultivated forests. Similar conclusions can be drawn for other dimensions, such as age, ethnicity, access to natural resources etc., namely that the older people become, the more they will know, on average. Together, these dimensions underline the importance of place or context for knowledge production on biological diversity. However, it soon became apparent in the Araracuara region that the picture I developed of the social distribution of knowledge on plant diversity was less than complete when such standard variables of social organisation were employed and isolated. It cannot be assumed, for example, that any old person will know more about plants than a young one. The variation within each of these dimensions is too great. Two multidimensional variables developed concerning the ways people live and their kind and degree of participation in certain social and cultural institutions reveal that knowledge and learning is not simply distributed according to the activities, which are related to material production. So, indigenous peoples' knowledge production is not simply a matter of undifferentiated routine-like interaction with nature. Individuals as well as social and cultural groups pursue different strategies and have different needs. These strategies,

influenced by the ways in which people relate, think, produce, feel etc. affect the production, reproduction and distribution of knowledge. This explains why there are differences with respect to what people of the same age, ethnicity... know.

I am fascinated and positively surprised to discover that, contrary to what might be expected, there are tendencies toward increased participation in cultural mechanisms, institutions, and practices contributing to a strengthening peoples' capability to confront everyday problems. This is happening in spite of the heavy pressures exerted on local livelihood and natural resources, now and during the last century.

There is a significant overlap between the indigenous people in the Araracuara region, who participate in these institutions, and those who express vast and detailed ethno-botanical knowledge. The overlap is even clearer when this participation is qualified on more or less advanced levels.

In addition to the positive relationship between the ways people choose to live and *what* they learn, their way of life also relates to *the ways* they learn about plants. Certain livelihood strategies draw on a number of knowledge institutions and others do not. These knowledge institutions not only involve sets of rules and norms, and exchange of information, but also well-established learning processes and pedagogical techniques, aimed at increasing the individual and collective intellectual capacity to solve problems. Advanced research-like activities have been developed and formalised into institutions, complex learning systems, and careers and positions of specialisation.

In short the knowledge institutions I studied favour principles of open-mindedness, social engagement, developed reflective abilities, and eagerness to learn and put the learned to practice. These highly developed reflective practices, coupled with the rather successful struggle for the protection of basic rights and identity, contribute to the resilience of the cultural learning and livelihood system, even in situations of instability, massive pressure on natural resources, and the presence of powerful promoters of social change.

A central interface between cultural and modern means of communication and storage of information takes place in the meeting between the oral and the written. The joint making of the publication, "Fééjahisuu – Palms of the Grandchildren of the Centre of the World" (Kronik *et al.* 1999) is a good example to demonstrate how cultural learning processes are becoming reflective in a new manner. During the process of establishing, finding, and describing the range of palms known by the Muinane, I went through the information with individuals at least a dozen times. Finally, a forum was established where the three clans agreed upon the content of the book after having negotiated intra-cultural variations in the names and classificatory order of the 80 palms. Making the book was a precondition put by the three clans for allowing from the three clans for allowing my research. The book is now part of their school curriculum. While people often felt uncomfortable in the process of making what many in the beginning saw as "the finite, static truth" on palms, in spite of their declared interest in having the product made, the process of correcting, adjusting and negotiating the content and order of the domain, contributed to raise the critical awareness towards written texts, and demonstrate the value of their reflective practices and procedures in establishing good knowledge.

These reflective practices, and new ways of employing and developing them have contributed positively to my construction of knowledge production in the study areas. My understanding is thus developed and informed iteratively within the field of theory, understanding and deconstruction of societal debates, and from insights into local ways of thinking about and acting upon knowledge about human/nature relations. The examples of key persons' and key groups' continuous validation of my knowledge, such as in the confrontation of knowledge constructions, and the processes of making the two films (Kronik 1997; Kronik and Krøyer 2001) and the book of palms (Kronik et al 1999) increase the value of the results. Steinar Kvale refers to these phenomena as "intersubjective agreements" (Kvale 1996). His concept is a reflection of the current emphasis within the social sciences on regarding truth to be negotiated in a local context. Hereby, the interpretative community is extended to include the subjects investigated and the lay public. Communicative validation approximates an educational endeavour where truth is developed in a communicative process, with both researcher and subjects learning and changing through the dialogue.

And this is common to other cultural interfaces in the region. Although the rules and norms of the institutions in Araracuara and Chukik+ are often referred to as rigid in their demand for highly moral behaviour, and the ontology is described as exclusive, absolute, and essentialist, they are highly flexible in relation to social change. The emphasis made locally on focused inquiry, process-oriented learning, and also the experimental nature of many daytime activities, are what I see to be the most central processes for maintaining and developing the knowledge system. These processes and the cultural notion of the inability to learn good knowledge without studying the methodology of how to learn to understand complex relations, opens up the system and provides for rather smooth contact with modern bodies of knowledge. Through such processes, non-localized information becomes accepted or discarded, moderated, and read into one of the dominating debates concerning how to deal with nature. Hereby, the large group of people who carry out culturally based practices in material production and reproduction, and among them the large group of people involved in the described institution of the dance (in chapter 5; Kronik 1997; Kronik and Krøyer 2001), are better equipped to adapt 'non-local' knowledge to the local context. In this respect, the agricultural knowledge domain for example, is highly flexible to social change, in the sense that it is largely based on experimentation.

This contributes to the conceptual debate concerning what constitutes and influences knowledge production. Knowledge production does not only depend upon a particular place where it is generated and maintained and on concrete experiences gained through material production. It also depends upon the cultural framework, which among other things consists of and is developed by knowledge institutions and institutionalised practices, processes, and relations. In my view, this deserves the attention of research and development efforts concerning current and future use and conservation of biodiversity.

Both cultural frameworks and knowledge institutions are influenced by and influence the socio-political context in which they function. Further understanding of the dynamic and differentiated nature of cultural knowledge systems and the conditions for their survival, well-being, and development could facilitate targeted efforts to secure local and global demands to benefit from biological diversity. Some types of social change lead to the dismantling, degeneration, or low degree of participation in institutions important for distributing, generating, and storing knowledge, and even for conserving biodiversity. This may result in loss of biodiversity and/or failure to learn and to transmit knowledge.

The often young indigenous political leaders have to learn to master the arguments of these various types of debates. In some cases, this leads to a schism between the leaders and their constituencies; in other cases, both leaders and their cultural groups benefit from the wider potentials. To navigate in the various political arenas and obtain the best results possible, indigenous peoples' organisations form strategic alliances with NGOs (and their lawyers and anthropologists etc.), and international agencies, and they are assisted locally by various bodies and advisors.

A central debate which indigenous people log onto in Colombia is that on constitutional rights. This debate is special in that a strong legal body backs it, and state agencies are assigned the task of carrying it out. While this is probably the debate which the indigenous organisations have gained the most from, in terms of political and cultural rights, and to some extent economic benefits, the reach of their struggle is also limited within this debate, as large parts of the areas populated by indigenous peoples' are outside government control. Indigenous groups are up against opposing economic and political interests, often enforced or mediated by armed groups, as well as groups of civilians who are pushed in, or pulled out by the development of the agricultural frontier. What is interesting is, that in order to benefit from the political space offered through the improved constitutional rights, indigenous actors have to emphasise certain aspects of their culture and ways of living in their dialogue with the state, while other activities recede into background. This gives certain groups within the indigenous communities increased space to pursue their strategies, and strengthen their positions. An example is the discussions in the Araracuara region concerning bilingual education. One group of 'traditionalists' aims to recover completely what they see as lost ground to Colombian modern, Christian education, while more moderate people work for a combination of the best of both learning systems. When the traditionalists gain influence, they make demands on their leaders with regard to their public appearances and way of living. This also has a tendency to strengthen cultural identity and their institutions.

Several leaders from the Araracuara region have learned to express their arguments that reflect the context they are part of and the actors they are confronted with. They have benefited from the developments for increased legal rights, and have learned how to work the political system through collaboration with a few politically engaged NGOs and through high school scholarships in Colombian cities. Some have further explored the political arguments for cultural diversity through work and friendship with anthropologists doing fieldwork in the region over the past decades.

Indigenous peoples' organisations use the international concerns with biodiversity expressed in the *biodiversity* debate strategically to gain and/or further political objectives, including land rights, decentralisation, and cultural survival. Unlike other demands formulated and/or joined by indigenous peoples' organisations and supporting actors in which ethical concerns are central, the recent line of argument within the political struggle of the indigenous peoples' movement is based on their ancestral and on-going creation of and proprietorship to specific valuable knowledge. In quite a number of development project proposals developed by indigenous leaders, which I was asked to comment, and in many speeches I have overheard delivered to state officials, development NGO's and researchers visiting the region, or during national level conferences, the references to their knowledge of the forest abounded, and were used as necessary preconditions for successful use of natural resources.

In the international debate on biodiversity this argument continues, saying that these particular lifestyles rest upon certain cultural and biophysical circumstances, so that if these are threatened, the processes necessary for the maintenance and development of such “*knowledge, innovations and practices*” (CBD 8j) will also be threatened. These links “*between conservation of biological diversity and cultural diversity, and the dependence of such communities and the continuation of their traditional access to biological resources*” are now recognised (www.biodiv.org). The processes leading to the creation of such knowledge are embedded in so-called traditional lifestyles.

Considering the heterogeneity among and within indigenous peoples’ communities and organisations, it is promising to see how far they have managed to come in influencing and opening such political spaces as the negotiations on the Convention of Biological Diversity. I have already stressed the indigenous movement’s strategic cultural politics as one explanation for their current successes. However, the rhetoric and alliance building would be short-sighted and of limited effect had they not been substantiated with very strong arguments concerning knowledge of biodiversity and mechanisms to use it and not least, conserve it. The recommendations issued by the Keystone group and the work of academics underlining the need to base future conservation efforts to a much larger degree on *in situ* use and conservation strategies and mechanisms were instrumental in this process. Indigenous peoples’ knowledge of the utility and ecological characteristics of plants and their models for conservation have proved to be particularly vast, complex, and detailed in highly diverse environments. The Dance of Fruits is an example of this from the study area of a highly developed and efficient mechanism for *in situ* conservation and exchange of plant genetic material, and it seems to be a real novelty to the ongoing political and technical debates on the character, usefulness and resilience of such models and mechanisms.

This line of argument has also manifested itself locally. Young leaders, having attended national level workshops, know the rather simple line of argument by heart, “*for we are the ones who know the forest*”; however, these leaders have been met with criticism, both locally and among national-level actors, for lacking legitimacy. This seems to have influenced some to engage in more cultural institutions and practices, so that as of recently, a new type of leader is emerging. These leaders manage to engage actively in their cultural institutions, such as the *mambeadero* and the ritual dances including dialogues and learning processes concerning knowledge of plants; likewise they have the capacity to take part in the national and international debates on biodiversity, including legal claims and technical specificities; and they participate in national cultural diversity debates. And they inform their arguments in one type of debate, using arguments learned from another. For example, they employ their experiences with indigenous learning processes and means of conflict resolution; they use their understanding of natural science institutions and research methodology, learned through contact with the national and international research centre for which many have worked as research assistants or guides; and they use their knowledge of the political and administrative system gained through indigenous peoples’ and supportive organisations and their experiences with legal claims and development projects. Their background and the recent years of cultural and modern apprenticeship and leadership have enabled them and their supporters to situate themselves as legal actors, both within the indigenous administrative structure and within greater Colombian society, and thus engage in cultural politics, securing land rights, access to government resources, and developing partnerships with other local, national, and international actors.



# LEVENDE VIDEN OM BIODIVERSITET

– Institutionaliseret læring blandt Muinane og Uitoto i  
colombiansk Amazonas

*Af Jakob Kronik*

Dansk resumé af phd-afhandlingen  
"Living knowledge - Institutionalizing learning practices about  
biodiversity among the Muinane and the Uitoto in the Colombian  
Amazon"

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Det hævdes, at 70% af de planter, der indeholder kendte kræftlindrende stoffer, stammer fra lavtliggende tropisk skov, og at 75% af de mest anvendte kommercielt forhandlede lægemiddelplanter bruges til formål, som traditionelt uddannede helbredere har anvist (Hecht & Coburn 1989, 61). Ydermere siges det at moderne screening af planter med henblik på medicinsk udnyttelse forbedres med 400% når indiansk viden konsulteres. Disse forhold illustrerer såvel den globale betydning af mangfoldigheden af planter i tropisk skov som vigtigheden af den lokale viden herom. Men hvordan kan det være at indianske folk ved så meget om det miljø de lever i? Hvordan lærer de? Hvad afhænger læringen af? Og er vidensproduktionen ligeligt fordelt? Hvordan bliver det brugt politisk? Spørgsmål som disse satte mig i gang med dette forskningsprojekt.

Afhandlingen er dertil motiveret af forståelsen af, dels at indianske folks kamp for rettigheder til indflydelse på livsbetingelser i høj grad afhænger af deres viden om og fortsatte adgang til biodiversitet, dels at bevarelsen af tropisk biodiversitet relaterer sig til indianske folks levevisstrategier og disses udvikling. Derfor analyseres forholdet mellem indianske folks vidensproduktion vedrørende biologisk diversitet, deres levevis og social, kulturel og politisk organisering, og stedet hvor de udspiller sig.

I kapitel 1 analyseres forskellige interessenters motiver og indgåelsen af strategiske alliancer, hvorved læseren føres igennem den stigende politisering af begrebet biodiversitet og de ressourcer det er udtryk for. Verden har ikke tidligere været vidne til et lignende tab af plante- og dyrearter (Abramovitz 1998), og det har intensiveret bestræbelserne for at beskytte og udnytte den biologiske diversitet nu og i fremtiden. Betydelige midler fra kommercielle og ikke-kommercielle interessenter bliver i disse år brugt på at kortlægge, dokumentere og prioritere ressourcerne. Hermed er en række gamle og nye konflikter og strategiske alliancer blevet mere synlige. Forsøg på at regulere parternes adfærd vha. ofte modstridende politiske tiltag, herunder etablering af nationale og internationale juridiske instrumenter, såsom verdenshandelsorganisationen WTO og Biodiversitetskonventionen, medvirker yderligere til at trække linjerne op. Indianske organisationer har med held brugt den internationale opmærksomhed vedrørende bevaring og fremtidig brug af biologisk diversitet til at indføre krav om rettigheder til jord og kulturel anerkendelse på dagsordenen i bl.a. FN.

I kapitel 2 analyseres begrebslige spørgsmål vedrørende vidensproduktionens dynamiske karakter og relationerne til sociale, kulturelle og biofysiske sammenhænge og betingelser. Det er blevet stadigt mere almindeligt at forstå vidensproduktion som en række processer, der fører til skabelsen af såvel konkret viden, viden om hvordan man gør forskellige ting, og viden om årsagsammenhænge. Fælles for disse forskellige slags viden, eller rettere betydningen og relevansen af dem er at de er subjektive og relaterer sig til den kontekst de er udviklet i, såvel historisk, socialt og kulturelt. Mens disse ideer, og den positivismekritik de indebærer vinder terræn i disse år, har spørgsmål om hvorvidt vidensprocesserne er relateret til kontekst, hvordan de eventuelt er, og hvorledes de påvirkes af social forandring, været

sparsomt berørt. Ved at lægge fokus på skabelsen af viden og de processer der medvirker hertil, brydes således med den gængse måde at analysere såkaldt lokal viden. Diskussionen af såvel mentale som relationelle vidensprocesser føres videre ved undersøgelsen af 'vidensinstitutioner', forstået som rammer af fælles forståelser, der institutionaliserer, fremdyrker og udvikler læreprocesser og evner.

Med henblik på krav fra politiske aktører om hård bevisførelse, udvikles i kapitel 3 en forskningsstrategi, der trækker på såvel etnobiologisk, sociologisk og antropologisk metode. Således kombineres en analyse af viden om diversiteten af palmer med en socialkonstruktivistisk analyse af opfattelser af levevis og produktionsformer.

I kapitlerne 4 og 5 udfoldes analysen af feltarbejds materialet. I kapitel 4 vises således hvordan biofysiske betingelser og social organisering bidrager til skabelsen af folks viden om biodiversitet, og i kapitel 5 hvorledes deltagelsen i, og udviklingen af kulturelt specifikke processer og institutionaliserede praksisser blandt Muinane og Uitoto folkene har afgørende betydning for kvaliteten og udbredelsen af indiansk viden om planter, og for levedygtigheden af denne viden i situationer af stærkt socialt pres.

#### Araracuara-regionen

Araracuara-regionen ligger geografisk på ækvator i det sydøstlige Colombia. Den våde tropiske regnskov i regionen kendetegnes af særdeles høj diversitet af både træer, palmer og anden vegetation (Duivenvoorden & Lips 1993, 79; Galeano 1990). Plantegruppen 'palmer' er som sagt anvendt som case på den biologiske diversitet. Deres fordeling i regionen afhænger af jordbundstype og -kvalitet, fugtighed og lysforhold samt historiske produktionsprocesser. Der er mange forskellige arter og varianter, og de findes bredt både på arts- og varietetsniveau (Galeano 1990; Morcote et al. 1996). Distributionen af palmer er dermed velegnet til en sammenligning af folks kendskab til dem.

Araracuara er præget af, at der er mange forskellige aktører, såvel indianske som ikke-indianske. Der er syv etnolingvistiske grupper, hvoraf den største gruppe er Uitoto. Araracuara er en, for denne del af Amazonas, stor landsby (ca. 80 familier, 330 personer), hvoraf lidt over halvdelen er Uitoto. Der er en kostskole, en landingsbane, et hospital, en kirke, et forskningscenter, butikker, telefon, fjernsynsstue og en bar. En colombiansk og en nordamerikansk militærbase har netop forladt Araracuara. På den anden side af Caquetafloden ligger nybyggerlandsbyen Puerto Santander med flere butikker og barer. Araracuara og Puerto Santander fungerer som handelscentrum inden for en radius på mere end hundrede kilometer.

Befolkningen har tætte slægtsbånd til en række mindre landsbyer oppe og nede ad floden. Disse samfund har ikke ligesom Araracuara den daglige kontakt til varer og vestlige institutioner. For at sikre maksimal variation i undersøgelsen, dvs. at flest muligt forskellige typer mennesker, institutioner og livsformer er repræsenteret, blev landsbyen Chukikis 80 indbyggere inddraget i analysen.

I Araracuara bor en forholdsvis stor del af befolkningen i 'kernefamiliehuse', og ikke i de indianske storfamilie-/fælleshuse, de såkaldte malocaer, som det er tilfældet i Chukiki.

Malocaen fungerer i mange indianske samfund i regionen som storfamiliens og ofte også klans og/eller landsbyens omdrejningspunkt for verdslige og religiøse handlinger. Det er ligeledes under malocaens palmetag, at megen viden om bl.a. planters anvendelse diskuteres, evalueres og bekræftes. Det sker bl.a. i forbindelse med et slags ceremonielt, akademisk uddannelsesforløb, organiseret omkring en række danse, som jeg vil vende tilbage til.

I Araracuara findes der i dag en fungerende maloca. I Chukiki findes en maloca for hver storfamilie. Mambeaderoen er mændenes natlige samlingssted i malocaens midte, hvor dagens begivenheder diskuteres og relateres til udvalgte passager og sammenhænge i indianernes skabelseshistorie. I Araracuara er der en større afhængighed af importerede varer og dermed af lønarbejde og (over-)fiskeri end i Chukiki. Det blev helt tydeligt i august/september 1996, hvor fødevarer- og benzinleverancerne brat ophørte. Cocaproducerende bønder og guerillaen indtog provinshovedstaden (ca. 800 km væk), og såvel militær som guerilla lukkede transportåren, floden Caqueta. De amerikanske og colombianske styrker i Araracuara fik deres leverancer med fly og havde pludseligt monopol på salg af importerede fødevarer. Selv om militæret officielt ikke måtte sælge ud af deres forsyninger, opstod der en 'kreativitet' blandt såvel militær som indianere og nybyggere. Mange indianere begyndte en større produktion af kunsthåndværk, som de byttede for færdigretter hos amerikanerne. Nybyggerne skrabede kistebunden eller tog som mange indianere arbejde på basen, betalt med højlandsmad. I Chukiki, hvor der stadigvæk er rigeligt med fisk (og skildpadder), mærkede man ikke andet til krisen end at trafikken på floden indskrænkede sig til små (paddle-) kanoer pga. mangel på brændstof. Araracuara har flere gange været første stop på vejen for migranter fra Chukiki og andre mindre Amazonsamfund til større byer. Araracuara er også stedet, hvor man kommer for at søge arbejde, oftest i kortere perioder (2-6 uger), f.eks. ved at fylde sandsække for amerikanerne og hjælpe til ved fragtning af fisk. Nogle af migranterne er blevet boende, bl.a. for at bo tæt på skolen eller hospitalet. Dette har stor betydning for familielivet og for de aktiviteter, som børnene får mulighed for at deltage aktivt i. Børn fra Araracuara bor hjemme under deres skolegang, mens børnene fra andre, fjernereliggende landsbyer har deres børn i kostskole.

Begge landsbyer er blevet befolket inden for de seneste 70-80 år. Nogle blev tvangsforflyttet til området fra århundredeskiftet frem til 1930 af brutale gummiproducenter, som via folkedrab, slaveri og epidemier grundlæggende ændrede regionens bosættelsesmønstre og -steder. Visse befolkningsgrupper med egne sprog og sæder ophørte med at eksistere, mens andre blev reduceret med 50-90%. Med sig tog de generationers kontekst og kulturelt specifikke viden. Andre formåede at flygte fra disse uhyrligheder, men kom tilbage, da den colombianske stat tilbød lønarbejde i forbindelse med opførelsen og driften af en række installationer og barakker, der fungerede som straffefangekoloni (ca. 1935-1965).

### Levevis og institutioner

For at undersøge betydningen af den måde folk lever på for deres viden om planter, har det været nødvendigt at udvikle en metode til at inddele en lokal befolkningsgruppe i flere lokalt definerede 'hverdagslivsstrategier'. Øvelsen går i korte træk ud på, at en række personer, der på forskellig vis er hinandens modsætninger, udvælges fra et eller flere lokalsamfund.

Hensigten er, at de skal inddele lokalbefolkningen i grupper ud fra deres opfattelse af 'hvordan folk tænker, handler, føler, producerer og omgås mennesker og institutioner' Jeg betegner dette 'hverdagslivsstrategier'. Efterfølgende bliver de bedt om at beskrive forskelle og ligheder i og mellem grupperne.

Ved at sammenholde beskrivelserne af de forskellige gruppers hverdagslivsstrategier, fremkommer hverdagslivskategorierne. I eksemplet fra colombiansk Amazonas, hvor befolkningen fra de to samfund var lagt sammen med henblik på at sikre maksimal variation samt et rimeligt statistisk grundlag, fremkom fire grupper med forskellige hverdagslivsstrategier: Ledere, rådgivere, kulturelle og ikke-kulturelle individualister.

Gruppen af 'ledere' beskrives som dem, der optræder som repræsentanter udadtil, dvs. som mæglere og beslutningstagere i kontakten mellem lokalsamfundet og statslige o.a. ikke-indianske institutioner. Det giver nogle fortrin, hvad angår indstrømning af informationer og ressourcer. Men klassificeringen var i høj grad normativ, og det blev vurderet positivt at kunne udvise kapacitet til at handle til fordel for lokalsamfundet. De har ligeledes lederskabet i kulturelle institutioner, såsom malocaen, lokalregeringen (en slags kommunalråd) og/eller som lokalsamfundets traditionelle rådgivere.

De andre tre grupper udviser ikke lyst eller kapacitet til lederskab. 'Rådgiverne' deltager sammen med 'lederne' i fællesarbejde, minga. Alle grupper beskrives som hårdtarbejdende. De kulturelle og ikke-kulturelle individualister er ikke sociale i deres tilgang til arbejdet. De er individualister, af lyst eller nød.

De 'kulturelle individualister' kendetegnes ved, at de stræber efter at opnå pengeindkomster. Det er blevet et vigtigt særkende for deres måde at omgås andre i samfundet på. Derfor deltager de heller ikke i ubetalt fællesarbejde.

De 'kulturelle ikke-individualister' består fremfor alt af mennesker, hvis tilværelse er svær. De er afhængige af pengeindkomster, dyrker jorden mindre end andre, fordi de i perioder ikke har råd til at hyre folk til at hjælpe. De mangler ofte mad og er tvunget til at låne af andre eller bede om at måtte høste i andres frugtplantager og chagras.

Inddelingen foretages således i forhold til deltagelse i lokale institutioner; kapacitet i produktion; karakteren af kontakten udadtil samt afhængighed af pengeindkomster. Fra stor kapacitet i produktion (ledere, rådgivere og til dels de kulturelle individualister) og lederskab i kulturelle institutionersamt i kontakt med eksterne institutioner (lederne), mod lav kapacitet i produktion (individualisterne), afhængighed af pengeindkomster og dermed ofte ulige kontakt med eksterne institutioner (individualisterne).

## Institutioner

'Folket fra Verdens Centrum', som Muinane- og Uitoto-indianerne i Colombia kalder sig, har i generationer gennemført en række unikke uddannelsesforløb. 'Frugternes dans' er et af disse forløb, hvor de både indsamler, videregiver og tester hinandens viden om specifikke tropiske planter og udveksler, planter og tester vigtige afgrøder (herunder frugttræer).

Uddannelsen, der varer 5-10 år, består af en serie af ceremonielle dansefester, hvor deltagerne har flere veldefinerede roller eller funktioner i de mere intense lærings- og 'Frugternes dans' samler én til to gange om året over en weekend 200-300 deltagere i landsbyen Araracuara. Gennem dans, sang og samvær eksamineres dansefestens vært og hans hjælpere i deres kapacitet til at løse livets gåder vha. deres viden om nytteplanter. Der er primært tale om økologisk, agronomisk og taxonomisk viden bundet sammen af viden og forestillinger om relationer mellem mennesket og en besjælet natur. Eksamensspørgsmålene bliver stillet i form af gåder. Gåderne er vævet ind i sangen og dansen og fremføres af en specielt inviteret indiansk ekspert og hans hjælpere. Da deltagerne under dansen viser deres egne praktiske erfaringer, kommer traditionel og ny viden i spil, hvorved ny fælles viden skabes. Som en af malocaens kulturelle rådgivere udtrykte det:

*"Hvis vi kan løse gåder om sygdomme og derved lære om plantesygdomme, vil vi også kunne løse og lære om problemer, vi måtte have; om sygdomme vi lider af. Derved lærer vi at helbrede og beskytte os. Det er derfor, at vi foretager denne praksis og kapacitetsudvikling, som gådeløsning i virkeligheden er. Den, der behersker sådanne evner, viden og erfaring med gådeløsning, kan også opdage og helbrede sine problemer her i livet" (Kronik 1998).*

Værtsparret og deres faste gruppe af assistenter afprøves i en bred vifte af færdigheder. De har til forløbet bygget et stort specielt palmehus, en maloca, der kan rumme de mange dansende gæster. Malocaen skal holde troperegnen og -solen ude i de mellem 5-10 år, uddannelsesforløbet varer. Hvis det viser sig, at malocaen ikke holder tæt inden forløbet er afsluttet, skal de starte helt forfra.

Værtsparret og assistenterne skal gennem hele perioden sørge for at have plantet og dyrket nok afgrøder både i mængde og i udvalg, så de kan bespise de mange gæster. Det er i høj grad kvindens agronomiske og organisatoriske viden, der herved testes. Sideløbende med den praktiske forberedelse, der foretages 10-14 dage op til selve festen, indøves og diskuteres den relevante viden med en specielt inviteret rådgiver. Det foregår om aftenen i malocaens mambeadero. Dansen, der varer til den lyse morgen, efterfølges af en evaluering aftenen derpå.

Gæsterne er forpligtede til at medbringe deres bedste eller mest sjældne frø og planter af de arter, som er udvalgt til de forskellige danse. Værten modtager planterne som en erkendelse for en god dans og fordeler dem blandt hjælperne. De er til gengæld forpligtigede til at så, plante og dyrke dem efter de anvisninger, som dansen har fremkaldt. Herved skabes en regional genbank med de bedste og mest sjældne arter af vigtige nytteplanter. Selv om såsæden siges at være hellig og derfor vil give høst i overflod, er den kulturelt nærrede skik for at teste alt muligt så stærk, at hjælperne sår frøene ved siden af deres egne for at afprøve, om de er bedre/anderledes.

'Frugternes dans' knytter sig til sundhed og beskyttelse i bred forstand. Dvs. viden om dyrkning og brug af planter til helbredelse og ernæring samt om beskyttelse mod ondskab i form af de sygdomme, som truer mennesket og planterne. Hver dans er således primært en eksamen i lokal viden om planter, men også i andre praktiske færdigheder i indianernes kultur. Institutionens rammer, dansen og indhold, dvs. både formidlingen og diskussionerne af

nye erfaringer i forhold til gammel viden samt genbankaspektet, gør uddannelsesforløbet til noget helt enestående.

### Formelle og uformelle læreprocesser

Visse vidensprocesser er som beskrevet institutionaliseret. Hver aktør eller individ er involveret i adskillige af disse processer i forskellige situationer, og det er netop situationerne, der varierer mht. vidensprocesser. I eksemplet med dansen var det primært processer såsom formidling, afprøvning, evaluering og vurdering. Men det er vigtigt at have for øje, at det blot er en del af den samlede produktion (reproduktion og distribution) af viden. Læreprocesser er langt fra alle 'akademiske' som i dansen, men optræder bl.a. under arbejdet i skoven, alene eller med andre. Hertil hører bl.a. observation, efterligning, at stille spørgsmål, eksperimentering, skabelse og afvisning (som ugyldigt). Den akademisk lærte eller på anden måde overførte viden testes i dagligdagen, ligesom erkendelser fra dagligdagen afprøves, debatteres og søges vurderet hos specialister, autoriteter og/eller i bredere kredse i bl.a. institutioner som malocaen, ved madbålet, under fællesarbejde, minga, såvel i 'dansen'.

Da jeg konfronterede forskellige lokale aktører (herunder lokale institutioner) med ovennævnte forståelse af, hvorledes viden om planter tilegnes, afprøves og sikres, understregede de tre nøgleelementer:

#### 1. Personligt initiativ, vilje og vedholdenhed.

*"Den bedste måde at lære på er, hvis spørgsmålet udspringer af en personlig søgen. Viden kan også læres ved at andre uopfordret fortæller noget, men denne viden bundfældes ikke nær så godt. Men det er ikke nok bare at spørge, man skal vise, at man er dialogen værdig ved at analysere, relatere og følge spørgsmålene op. Man skal udvikle evnen til at begrænse og fokusere sine spørgsmål for at kunne nærme sig sagens kerne".*

#### 2. Socialt samvær.

Dialog anses for lige så vigtigt som selve den viden, der diskuteres: *"Hvis vi alle vidste det samme - ville der ikke være nogen dialog", forklarede de mig en aften i malocaen og fortsatte "men man lærer intet alene, medmindre det kommer til een i en drøm".*

#### 3. Kapacitet til at overføre, relatere og teste kulturel viden (fra mambeadoeroens natlige seancer) til hverdagens problemer og fænomener.

*"Den, der ikke formår at udmønte nattens råd i handling, er en løgner. Ingen lytter til folks råd om sundhed og arbejde, hvis de har en syg familie eller ikke har luget deres frugtplantager" Mariano Suarez.*

Afhandlingens konklusion udlægger hvilke roller kulturelle institutioner og praksis har for den fortsatte udvikling af indiansk viden om biodiversitet, og viser hvorledes det bliver brugt i politisk i kampen for ret til jord, selvbestemmelse og kulturel identitet.

I tilgift til den viste positive sammenhæng mellem det folk lærer, og de måder de vælger at leve på (dog uden at falde i en såkaldt voluntarisme fælde), der en klar sammenhæng mellem folks levevis og de måder de lærer på. Visse levevisstrategier (livelihood strategies) trækker, i modsætning til andre, på en række indianske videns-institutioner. Disse institutioner består ikke blot i sæt af normer, regler, delte forståelsesrammer og informationsudveksling, men også veludviklede læringsprocesser og pædagogiske principper, som medvirker til en udvikling af individuel og kollektiv problemløsningskapacitet.

Feltarbejdet viser at avancerede forskningsprægede aktiviteter er udviklet og formaliseret som institutioner, komplekse læringssystemer, uddannelsesforløb og sociale og kulturelle positioner udfyldt af specialister. Disse højt udviklede refleksive praksisser, koblet med en succesfuld politisk kamp angående basale rettigheder, bidrager til de kulturelt baserede læringssystemer og levevisstrategiers modstandskraft og tilpasningsevne. Det er med en god portion fascination og positive overraskelse at jeg mod forventning har fundet tendenser der peger mod en styrkelse af kulturelle mekanismer, institutioner og praksisser gennem øget deltagelse. Disse bidrager til en styrket vidensproduktion og en bedre bevaring af domesticeret og ikke-domesticeret plante diversitet.

Disse fund bidrager yderligere til begrebslige og politiske debatter vedr. hvad der konstituerer og påvirker indiansk vidensproduktion. Indiansk vidensproduktion afhænger således ikke alene af specifikke steder, hvor det skabes, vedligeholdes og de konkrete erfaringer, der vindes gennem materiel produktion. Den afhænger også af kulturelle dimensioner, herunder vidensinstitutioner og institutionaliserede praksisser, processer og relationer. Det fortjener videre opmærksomhed indenfor såvel forskning som udviklingsarbejde vedr. nuværende og fremtidig brug og bevaring af biodiversitet.

Den indianske bevægelses strategiske politiske manøvrer forklarer til dels deres forholdsvise succes inden for international ret. Men uden stærke argumenter til at bakke retorikken op med, forsvinder grundlaget for deres nyere alliancer og resultater. Såvel akademikere som forskellige institutioner og debatfora, såsom Keystone dialogen, har gennem 1990erne leveret ammunition, ved bl.a. at understrege betydning af såkaldet *in situ* bevaringsteknikker og mekanismer for udvikling og bevaring af biodiversitet. På trods af dette, er det meget begrænset hvad der blevet forsket i vedr. disse mekanismer. Indeværende afhandling bidrager med betydelig viden herom, ved at vise at indiansk viden ikke blot er imponerende detaljeret og omfattende, men også at den hviler i, og udvikles gennem kulturelle institutioner. Der gives et for litteraturen temmeligt enestående eksempel på en institution, der både udvikler og evaluerer lokal viden om planter, og fungerer som mekanisme til skabelse og vedligeholdelse af effektive *in situ* genbanker.

De nævnte eksplicite og avancerede vidensprocesser, og institutionerne der fungerer til bevaring af biodiversitet kan indgå som væsentlige elementer i bestræbelserne på at styrke indianske organisationer, til at blive bedre udstyret til at forfølge og stille krav til indiansk viden, og til andres brug af denne.