



LEARNING & KNOWING IN INDIGENOUS SOCIETIES TODAY



FINAL

**LEARNING & KNOWING
IN INDIGENOUS SOCIETIES TODAY**

This book should be cited as:

UNESCO, 2009, *Learning and Knowing in Indigenous Societies Today*.
Edited by P. Bates, M. Chiba, S. Kube & D. Nakashima, UNESCO: Paris, 128 pp.

This publication is a collaborative effort of:

The Local and Indigenous Knowledge Systems (LINKS) Programme, Natural Sciences Sector
The Intangible Heritage Section, Culture Sector
The Division of Cultural Policies and Intercultural Dialogue, Culture Sector

Acknowledgements

Ken-ichi Abe, Japan Centre for Area Studies, Osaka National Museum of Ethnology, Japan
Claudia Benavides, Local and Indigenous Knowledge Systems (LINKS) Programme, Natural Sciences Sector, UNESCO
Noriko Iizuka, Japan Centre for Area Studies, Osaka National Museum of Ethnology, Japan
Tetsuya Inamura, Professor, Aichi Prefectural University, Nagoya, Japan
Wil de Jong, Japan Centre for Area Studies, Osaka National Museum of Ethnology, Japan
Anahit Minasyan, Endangered Languages Programme, Intangible Heritage Section, Culture Sector, UNESCO
Annette Nilsson, Local and Indigenous Knowledge Systems (LINKS) Programme, Natural Sciences Sector, UNESCO
Susanne Schnuttgen, Division of Cultural Policies and Intercultural Dialogue, Culture Sector, UNESCO

Editors

Peter Bates, Local and Indigenous Knowledge Systems (LINKS) Programme, Natural Sciences Sector, UNESCO
Moe Chiba, Division of Cultural Policies and Intercultural Dialogue, Culture Sector, UNESCO
Sabine Kube, Endangered Languages Programme, Intangible Heritage Section, Culture Sector, UNESCO
Douglas Nakashima, Head, Local and Indigenous Knowledge Systems (LINKS) Programme, Natural Sciences Sector, UNESCO

Design & Production

Julia Cheftel, Local and Indigenous Knowledge Systems (LINKS) Programme, Natural Sciences Sector, UNESCO

Cover images

Julia Cheftel, Supin Wongbusarakum, Marie-Claude Mattéi Muller, Nigel Crawhall & Peter Bates

Printed in 2009 by the United Nations Educational, Scientific and Cultural Organization
UNESCO, 7 Place de Fontenoy, 73752 Paris 07 SP, France

The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or its authorities, or concerning the delineation of its frontiers or boundaries.

The authors are responsible for the choice and the presentation of the facts contained in this text and for the opinions expressed therein, which are not necessarily those of UNESCO and do not commit the Organization.

For further information, please contact:

Douglas Nakashima
UNESCO-LINKS
1, rue Miollis, 75732 Paris Cedex 15 France
Email: d.nakashima@unesco.org
Website: www.unesco.org/links

FOREWORD

As the United Nations specialised agency for the sciences, culture and education, UNESCO is uniquely placed to surpass disciplinary boundaries anchored in Western thought. One such disciplinary dualism separates biological and cultural diversities, even though it has been repeatedly demonstrated that the two are inextricably interlinked. Amongst indigenous peoples, to take one example, biological diversity is a source of sustenance and inspiration for their cultures, livelihoods and knowledge, while at the same time indigenous knowledge and practice shape and even enhance biological diversity. Biological and cultural diversities are further united today by the challenges that they both face: globalisation and transformation, which in some cases may lead to declining diversities of both cultural and biological landscapes.

KNOWLEDGE transmission and learning within contemporary indigenous communities is one critical area of reflection and work that lies along this challenging interface between biological and cultural diversities, while also connecting to the domain of education. On the occasion of the 2005 World Exposition held in Aichi, Japan, the Natural Sciences and Culture Sectors of UNESCO joined forces to address this issue through an experts meeting on 'Safeguarding the Transmission of Local and Indigenous Knowledge of Nature'. The Culture Sector provided perspectives from the cultural policy angle, emphasising the role of intercultural dialogue and sharing priorities and concerns that have emerged in the framework of the 2003 Convention for the Safeguarding of Intangible Cultural Heritage. The contributions included knowledge and experience on safeguarding endangered languages. Additional perspectives were provided through actions on Cultural Policies and Intercultural Dialogue. The Natural Sciences Sector contributed expertise and priorities from its Local and Indigenous Knowledge Systems (LINKS) programme, which focuses on the diverse ways that humans know and interact with the natural world.

INTERTWINING these complementary perspectives on biological and cultural diversities, UNESCO brings together in this volume key papers from the Aichi experts meeting that explore the challenges of acquiring and passing on knowledge and practice in a wide array of indigenous communities from around the world. In this manner, it is hoped that UNESCO may advance international understandings of the complexities of sustaining the dynamism of indigenous knowledge in contemporary worlds.

Françoise Rivière
Assistant Director-General for Culture

Walter Erdelen
Assistant Director-General
for the Natural Sciences

CONTENTS

- 6 INTRODUCTION**
PETER BATES & DOUGLAS NAKASHIMA
- 8 CONTRIBUTORS**
- 11 THE INDIGENOUS PEOPLES OF VENEZUELA IN SEARCH OF A PARTICIPATIVE AND INTERCULTURAL EDUCATION FOR THEIR SURVIVAL**
MARIE-CLAUDE MATTÉI MULLER
- 25 SUSTAINING INDIGENOUS LANGUAGES AND INDIGENOUS KNOWLEDGE: DEVELOPING COMMUNITY TRAINING APPROACHES FOR THE 21ST CENTURY**
MARGARET FLOREY
- 39 TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK) AND BIOCULTURAL DIVERSITY: A CLOSE-UP LOOK AT LINKAGES, DELEARNING TRENDS, AND CHANGING PATTERNS OF TRANSMISSION**
STANFORD ZENT
- 59 BIODIVERSITY REGENERATION AND INTERCULTURAL KNOWLEDGE TRANSMISSION IN THE PERUVIAN ANDES**
JORGE ISHIZAWA & GRIMALDO RENGIFO
- 73 LOSS OF TRADITIONAL PRACTICES, LOSS OF KNOWLEDGE, AND THE SUSTAINABILITY OF CULTURAL AND NATURAL RESOURCES: A CASE OF URAK LAWOI PEOPLE IN THE ADANG ARCHIPELAGO, SOUTHWEST THAILAND**
SUPIN WONGBUSARAKUM
- 87 TRANSMITTING INDIGENOUS KNOWLEDGE THROUGH THE SCHOOL CURRICULUM IN A DIMINISHING BIO-CULTURAL ENVIRONMENT: THE CASE OF BOTSWANA**
HERMAN M. BATIBO
- 95 LEARNING AND INUIT KNOWLEDGE IN NUNAVUT, CANADA**
PETER BATES
- 107 AFRICAN HUNTER-GATHERERS: THREATS AND OPPORTUNITIES FOR MAINTAINING INDIGENOUS KNOWLEDGE SYSTEMS OF BIODIVERSITY**
NIGEL CRAWHALL

THE loss of their specialised knowledge of nature is a grave concern for many indigenous communities throughout the world. Changes to the social environment, generally brought on by the introduction of new technologies, lifestyles and market economies through colonisation and modernisation, undermine the transmission of 'indigenous' or 'traditional' knowledge. This process is often accompanied by the transformation of the natural milieu, for example when rainforests are converted to pasturelands, or valleys are flooded to become reservoirs, radically altering the arenas in which indigenous knowledge would be acquired and passed on.

THE issue of education, as it is understood in a Western context, occupies a pivotal role in this process, highlighted by many as both a major cause of the decline of indigenous knowledge, and also as a potential remedy to its demise.

IN the classical Western understanding of the term, education tends to involve learning through instruction and reading, and by internalising abstract information which may later be applied in specific real-world contexts. For many indigenous cultures, however, learning occurs through the process of observing and doing, and by interacting over long periods of time with knowledgeable elders and the natural environment. This learning process is so subtle and unobtrusive that often it is not recognised as learning at all, even by the learners themselves. The knowledge resulting

from this latter process is not necessarily abstract information, but is instead intricately bound to experiential process. For many indigenous peoples, knowledge is thus an integral aspect of a person's being, and by separating it from its context one may render it meaningless.

AS might be imagined from these fundamentally contrasting epistemologies, it seems that the two ways of learning – Western and indigenous – may be uncomfortable bedfellows. Time spent by indigenous children in classroom settings is time that they are not spending learning through experience on the land, weakening their knowledge of the local environment and their interactions with the community. In formal schooling, teachers are figures of authority and Western 'scientific' knowledge is often presented as the 'superior' way to understand the world. This weakens the respect that children have for community elders and their expertise. Furthermore, curricula may contain little of relevance to local realities or may actively denigrate local culture. Colonial languages are frequently the modes of instruction, further hastening the decline of indigenous and vernacular languages, and widening the rift between elders and youth.

MANY indigenous communities are therefore in a quandary. While formal education promises to open pathways to the material benefits of the Western world, at the same time it tends to be destructive to indigenous knowledge and

worldviews. Furthermore, education curricula, designed for a mainstream and largely urban populace, may be of limited utility for remote rural communities where wage-earning jobs are few and far between. Indeed, acquiring indigenous knowledge of how to navigate and survive on the land, and how to use local resources to feed, clothe and provide for one's family, may be of much greater relevance for the contexts in which many indigenous groups continue to live today.

COMMENDABLE efforts are being made to better align educational curricula with indigenous realities by incorporating local knowledge and language content, but the interrelationship and balance between the knowledge forms remains delicate. These issues, and attempts to address them, are explored within this volume.

STRUCTURE OF THE BOOK

THE book is organised into three sections. The first addresses the link between indigenous knowledge and indigenous language, and explores the opportunities this interconnection provides for understanding and countering declines in both. The second section examines how the loss of indigenous knowledge due to insensitive school programmes may be countered by integrating indigenous knowledge and languages into school curricula. The third

INTRODUCTION

section explores the need for the revitalisation of indigenous ways of learning, generally outside of a classroom environment, and how this may be practically viable in modern contexts.

LANGUAGES & LEARNING

In her paper, Marie-Claude Mattéi Muller describes the political situation in Venezuela, in which increasing pressure from vigorous indigenous organisations has led to increasing legal protection for indigenous knowledge and languages. She also illustrates the complexity of these language-knowledge systems, and examines how new laws, legal measures and educational programmes will advance indigenous knowledge and language preservation.

THE paper by Margaret Florey describes a training programme taking place in Indonesia, where the transmission of indigenous knowledge has been severely compromised by a rapid shift in language use due to change in the social and natural environment. The programme works with elders and youth from the community to reestablish community bonds and pride in indigenous knowledge and languages.

A detailed analysis of trends in the transmission of indigenous knowledge is provided in the paper by Stanford Zent. Using linguistic data collected during research with the Jofí and Piarao Indians of the Venezuelan Amazon, the author presents statistically modeled

visual representations of learning trends, which shed new light on the intricacies of knowledge loss in specific socio-ecological contexts.

CLASSROOM LEARNING

THE paper by Jorge Ishizawa and Grimaldo Rengifo describes the work of the Proyecto Andino de Tecnologías Campesinas (PRATEC) in the Peruvian Andes. The authors explain that the in-depth knowledge held by *campesino* farmers has given rise to an astonishing variety of domesticated crops, and continues to support rural communities. They contrast this knowledge with knowledge derived from Western schooling, and go on to propose ways in which children in Andean schools might receive the benefits of both ways of knowing.

THE paper by Supin Wongbusarakum discusses knowledge loss and preservation amongst the Urak Lawoi people of the Andaman Sea of Southwest Thailand. The author explains that changes to Urak Lawoi lifestyles have impacted on their knowledge of the marine environment. She also discusses ways that this loss might be countered, through innovative documentary techniques and school programmes.

THE ways that formal classroom-based education systems have reduced the transmission of indigenous knowledge amongst the San of Botswana are explored by Herman Batibo in his paper.

He introduces a project which aims to counter this loss, whilst at the same time helping San children remain in the school system. This project focuses not only on children, but also on training their teachers, and involving the community as a whole in the educational processes of the school.

LEARNING ON THE LAND

THROUGH the presentation of ethnographic research with Inuit in Arctic Canada, Peter Bates argues that bringing indigenous knowledge into formal schooling may have an effect opposite to that desired. It may restructure and thus distort indigenous knowledge, and further erode ties between young Inuit and their elders and the land. He suggests that learning while out on the land with knowledgeable elders still has a vital role to play in Arctic communities, and may often better serve young Inuit with the skills they need for modern community life than formal schooling.

USING three case studies from around the continent, Nigel Crawhall's paper explores the threats to the transmission of indigenous knowledge in Africa, and the political and environmental processes behind these threats. He goes on to argue that linking indigenous knowledge and skills to the labour market can revive indigenous knowledge within communities and lead to its reevaluation by governments and conservation agencies.

PETER BATES is a consultant for UNESCO's Local and Indigenous Knowledge Systems (LINKS) Programme, based in Paris, France. With an initial background in ecology and environmental science, he completed an interdisciplinary PhD in anthropology and ecology in 2006, focusing on the interrelationships between Inuit knowledge and Western science. He has carried out long term fieldwork with Inuit in the Canadian Arctic, on projects relating to caribou migration patterns.

HERMAN M. BATIBO has conducted several sociolinguistic studies among the Khoisan communities of Botswana since 1994. His main concern is the critical language endangerment and the dramatic loss of biocultural diversity experienced in these communities. He is therefore involved in extensive language documentation and language empowerment projects. He is at the same time Professor of African Linguistics at the University of Botswana where he teaches African languages and linguistics in the Department of African Languages and Literature. Moreover, he is a member of many regional and international academic organizations, including the World Congress of African Linguistics, of which he is currently the president. Also he is a member of the UNESCO Committee on the Safeguarding of the Endangered Languages of Africa.

NIGEL CRAWHALL is Director of Secretariat of the Indigenous Peoples of Africa Coordinating Committee (IPACC, www.ipacc.org.za). He was previously Cultural Programme Manager of the South African San Institute and Director of the South African National Language Project. He holds a PhD from the University of Cape Town on the cause of the loss of indigenous !Ui languages in South Africa. He is currently the Co-Chair of the IUCN Strategic Direction on Governance, Communities, Equity, and Livelihood Rights in Relation to Protected Areas.

MARGARET FLOREY is an experienced field linguist who has worked for twenty years with speakers of endangered languages in eastern Indonesia. She is actively involved in advocacy and international capacity building activities with members of indigenous communities. Her research interests include the minority languages of the Austronesian and Australian language families, language endangerment, language documentation and ethnobiology. She has published extensively on the endangered languages of the Austronesian region. Margaret is a consultant linguist with Terralingua and serves on its Board of Governors, is a co-founder of the Resource Network for Linguistic Diversity, and chairs the steering committee for the International Conference on Austronesian Linguistics.

CONTRIBUTORS

JORGE ISHIZAWA has devoted his professional career to diverse aspects of socio-economic planning, systems and informatics with both the Peruvian public administration and international organisations. Since 1996 he has been a member of Proyecto Andino de Tecnologías Campesinas (PRATEC), an institution devoted to the affirmation of Andean culture.

MARIE-CLAUDE MATTÉI MULLER has worked for thirty years with indigenous peoples of Venezuela (Eñepa (Panare), Mapoyo, Yabarana, Yanomami), focusing her research on their language and culture. Her publications – among which are two illustrated bilingual dictionaries – present not only linguistic and anthropological data but also information on fauna and flora of the Amazonian area of Venezuela. She worked as a professor of linguistics and indigenous languages of Venezuela for 25 years in the Central University of Venezuela. Presently she is collaborating with the Direction of Indigenous People in Venezuela's Ministry of Education, in the elaboration of several books regarding indigenous knowledge and culture, which are intended chiefly for the Intercultural and Bilingual Program.

GRIMALDO RENGIFO is the founder and present coordinator of the Proyecto Andino de Tecnologías Campesinas (PRATEC). Trained as a teacher, he has extensively researched Andean peasant agriculture and has promoted the cultural affirmation of Andean Amazonian communities.

SUPIN WONGBUSARAKUM received her PhD in human geography from the University of Hawai'i. She has worked on projects related to the relationship between coastal and marine resources and indigenous and local communities, including the Urak Lawoi of the Adang Archipelago, since 1997. She is currently a project leader in the Research Program, East-West Center in Honolulu, and is the main author and trainer of the NOAA and SPREP-funded Socioeconomic Monitoring Guidelines for Coastal Managers in Pacific Islands Countries. Having worked as a social scientist consultant for UNESCO, UNDP, NOAA, NSF, USAID, the Social Science Research Institute of the University of Hawai'i, and the Nature Conservancy/Micronesia Program on projects related to the conservation and rehabilitation of coastal environments, marine protected areas and traditional cultures, socioeconomic assessment, coastal hazards, and climate change, she is a strong advocate of taking local and traditional cultures into account in resource management and sustainable

development, and of actively engaging local stakeholders through consultation, planning, capacity building, collaborative work and evaluation.

STANFORD ZENT is an environmental anthropologist and since 1992 has worked as a Researcher and Professor in the Centro de Antropología del Instituto Venezolano de Investigaciones Científicas (IVIC), in Caracas, Venezuela. He holds a B.S. degree in anthropology from Tulane University and a Ph.D. degree in anthropology from Columbia University. His research interests include ethnecology, historical ecology, traditional ecological knowledge, biocultural conservation, and native cultures of lowland South America. He has conducted fieldwork among the Piaroa, Jot'i and Eñepa indigenous groups of the Venezuelan tropical forest during the past 25 years. From 2001-2006, he participated in a community-based mapping and land demarcation project with Jot'i and Eñepa groups, in support of their land claims. More recently, he has been working on the development of an indicator for measuring the vitality status of traditional ecological knowledge (VITEK) in diverse socio-cultural and bioecological settings, with the goal of contributing to the search for verifiable measures that can be used to assess the progress of global environmental policy.



©Marie-Claude Maaté Müller

**THE INDIGENOUS PEOPLES OF VENEZUELA IN SEARCH
OF A PARTICIPATIVE AND INTERCULTURAL EDUCATION
FOR THEIR SURVIVAL**

MARIE-CLAUDE MATTÉI MULLER

INTRODUCTION

UNTIL 1990, the knowledge of the indigenous peoples of Venezuela interested mainly a few research-workers in anthropology and linguistics, but did not concern the Venezuelan Government, which tended to favouring the integration of these minorities into the national society. However, for the last ten years, Venezuela has been experiencing notable political changes, some of which have drastically modified the political status of indigenous peoples in the country. Partly due to pressure from vigorous new indigenous organisations, a set of governmental laws and programmes has not only stimulated the re-valuation of indigenous languages and cultures, but has also made it necessary to safeguard them. In this paper I aim to explore these policies. I will focus my analysis on the new strategies used to transmit and promote

traditional indigenous knowledge, as well as on the newly developed concept of 'interculturality'.

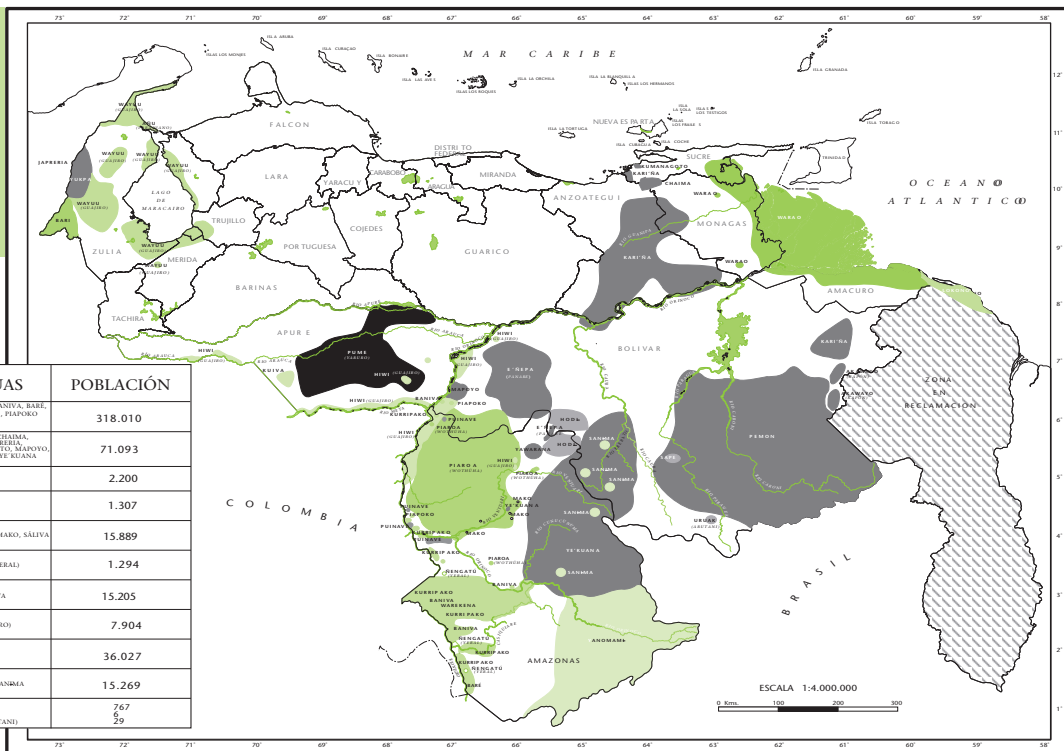
DEMOGRAPHICAL AND GEOGRAPHICAL BACKGROUND

ACCORDING to the 2001–2002 census, the indigenous population of Venezuela presently stands at 534,816 persons (Allais 2003; OCEI 2005), which corresponds to 2.2 per cent of the total population (25 million). This percentage can seem somewhat small, but is comprised of 36 ethnic groups, representing a great variety of languages and cultures, each one with its own wealth of traditional knowledge. In addition, the great majority of these groups, twenty-eight of thirty-six, live in the watershed of the Orinoco River, and more precisely in the Venezuela Guayana, which is an exceptionally biodiverse area.

LOCATED between 1° and 11° latitude north, Venezuela as a whole belongs to the American Tropic, or Neo-Tropic, which is considered to be the richest region of the world in terms of biodiversity. In the southern part of Venezuela, the Guayanese Shield is the area of the country in which the majority of animal and plant species are concentrated (Aguilera et al. 2003; Lasso et al. 2003). This is due to its old and complex geographical history and its varied and complicated geomorphology, including numerous isolated mountainous systems, valleys, hills and a mosaic of lowlands, each with different ecosystems. Based on current information it is safe to affirm that this is the most biodiverse region of the country, most particularly in terms of phyto-diversity (plant diversity). According to botanical research over the last ten years, there are, in Venezuela, approximately 15,350 species of vascular plants. Two thirds of these (9,500 to 10,300) are in the Guayana region (Huber et al.

MAP 1

Indigenous languages of Venezuela



1998; Steyermark 1972; Steyermark et al. 1995a, 1995b, 1997, 1998, 1999, 2001, 2003, 2004). The knowledge of nature that the resident indigenous peoples have accumulated through their ancestral and permanent presence in this important biodiverse area should be fundamental to any programme of nature preservation in Venezuela.

INDIGENOUS LANGUAGES, MIRRORS OF BIODIVERSITY

THE variety and extent of indigenous knowledge about flora and fauna could be estimated, in a first and superficial approach, by looking at the abundance of lexical items referring to these fields. In the glossary of invertebrates presented in my book on Yanomamí language and culture, *Lengua y Cultura Yanomamí* (Mattéi Muller 2007), I list forty-nine nouns referring to different species of caterpillars, forty-five referring to bees, twenty-four referring to wasps, thirty-three referring to ants, ten referring to termites and nine referring to crabs.

EACH of these words has not only a referential function, but usually also conveys an empirical experience. This is a source of various pieces of information attached to the 'named' species – its physical features, its habitat and its behaviour. Even more importantly, the techniques for collecting, hunting or fishing for a given species, and also its potential uses (edible or not, toxic or



©Marie-Claude Mattéi Muller



©Marie-Claude Mattéi Muller

not, venomous or not, for example) are also found within the naming system.

IT is important to point out that even the semantic elements which compound some of these words can give informational elements concerning some aspects of the species – for example colour, form, roughness or smoothness, thickness or thinness, sweetness or bitterness, or the precise location of its habitat. Semantic elements can also give information about relationships between different species or between species and their environment – relationships between fauna and flora, in particular. In Yanomamí, for example, some bees are called *pithatherimi*, literally 'inhabitant (*theri*) of the ground (*pitha*)', because

Collecting edible termites (above)
Looking for crabs (bottom left)

they build their hives on the ground; on the other hand there is a wasp called *ihirama rootimi*, literally 'perched (*rootimi*) towards the sun (*ihirama*)', because they build their hives very high on the top of the trees, orientated towards the sunlight. Another species of wasp is called *oraka raparapimí*, which literally means 'with a very long (*raparapimí*) exit hole (*oraka*)', because the inside of their hive has a very long tubular structure which leads to the exit.



Cutting a tree (left) to collect honey inside (below)



THE use of several plants is indicated by the literal meaning of their name, for example medicinal use is denoted in the names *haro kēki*, literally, ‘plant of healing’¹ (*kēki* is a classifier which refers to a herbaceous plant and *haro* is derived from the verb *haro-ai*, to heal); *propoko kēki*, literally, ‘plant of putting on weight’ (*propoko-ai*, to get fat); *yawë kēki*, ‘plant of growing’ (*yawë-ai*, to grow); *moha hi*, ‘tree (*hi*) of the *moha* worm’, because a piece of the bark is used to kill the parasitic worm; and *hura thocho*, literally, ‘vine of malaria’ (*thocho* means vine and *hura malaria*²) which serves to prepare an antipyretic beverage. There are more an-

1 This plant, which belongs to the Cyperaceae family (*Cyperus articulatus*) has an antipyretic and analgesic effect. It is used against headache, toothache, stomach ache and swelling due to an insect sting. Its mashed roots are rubbed on the affected area or soaked in water to prepare a beverage.

2 The most common meaning of *hura* is ‘spleen’, and one of the symptoms of the most dangerous case of malaria is the painful swelling of the spleen. Therefore, the Yanomamī refer to the illness (malaria) and the affected organ (spleen) with the same word *hura*.

tipyretic plants such as *prīsiprīsī thocho*, literally, ‘vine of fever (*prīsiprīsī*)’; or *hahō thocho*, literally, ‘vine of the *hahō* spider’, because it has a hairy skin,³ and as with the spider, touching it causes itching.

THE names of some plants which have a magical use (to prepare aphrodisiac, beneficial or evil powders) can indicate precisely to whom they should be applied and what their possible effects are. For example *ihiru kēki*, literally ‘herb of the child’, is a species of Cyperaceae which is cultivated by Yanomamī women. They crush the root, mix it with anotto (*Bixa orellana*) and rub the child’s body with the mixture in order to stimulate its growth. *Ohote kēki*, literally, ‘herb of the hard worker’ is supposed to give energy to the worker who puts it around his neck and his wrists. Other examples include *suwë kēki*, literally ‘herb of the

3 To use it, therefore, it must macerate in water. Then it is mashed and applied as a cataplasma to the head and the belly in order to lessen a fever.

woman’; *waitheri kēki*, literally ‘herb of the courageous or valiant and aggressive person’ (*waitheri*, valiant and aggressive); *manaka kēki*, ‘herb which makes women sterile and fat’; *aroari kēki*, ‘poisonous herb’; and *ahete kēki*, ‘plant which makes the destination nearer’ (*ahete*, near), also called *rope kēki*, ‘plant which makes you faster’ (*rope*, fast).

SOME lexemes reveal the relationships that the Yanomamī have observed between animals, chiefly between birds and other animals or between animals and plants. The four names, *iro heā*, literally ‘signal of the howler-monkey’; *iwa heā*, literally ‘signal of the alligator’; *oru kēki heā*, literally ‘signal of the snake’, and *totori heā*, literally ‘signal of the tortoise’, refer to different species of antbirds,⁴ each of which is associated with the presence of a particular animal. We could say the same of *tëpë heā*, literally ‘signal

4 These birds follow some species of aggressive ants in order to eat the insects attacked by the ants.

of the ant-eater', which refers to a trogon bird. Meanwhile, *kanae nini hi* (Caesalpiniaceae, *Tachigali paniculata*), literally 'tree of the *kanae nini* ants', is the habitat of aggressive ants *kanae nini* (Formicidae, *Pseudomyrmex* spp.), which men search for when they feel weak. The men shake the tree to knock the ants down in order to be stung, because the ants' formic acid has an energising effect. Examples of this kind are not rare in indigenous languages.

MOREOVER, a linguistic process, the nominal classifier, which is frequent enough in the Amazonian languages, can also be an interesting source of information. In the Yanomami language there exist many obligatory classifiers which allow us to distinguish some of the taxonomic criteria the Yanomami use to refer to the animal and plant kingdoms:

Aka, for example, is applied to the species of termites which live in subterranean cavities (*mapa aka*, *oshe aka*) and

akatho is used for lizards which live in subterranean cavities (*sharaima akatho*, *waraima akatho*, *reama akatho*).

REGARDING flora, some classifiers indicate the type of plant and some of its morphological features:

Këki refers to any kind of herbaceous plant. Several of these plants have a medicinal use, or a magical use, as was described above.

Mamoku refers to any kind of bulbous plant. *Mamoku* is the plural of *mamo*, which means 'eye', and is also used to refer to these plants because of the round form of their bulbs. Many of these plants are used as lures to attract game, chiefly birds, for example *paruri mamoku*, 'plant of the curassow', or *mayepi mamoku*, 'plant of the toucan'. Additionally, *iwa mamoku* lures alligators and *shama mamoku* attracts tapir.

Si refers to trees with a non-ligneous trunk, such as banana trees (Musaceae), all palm-trees (Arecaceae) and reeds such as *itiriti* (Marantaceae), among others.

Hi refers to ligneous trees, whatever their size or height. For example, *praki hi* denotes the hot capsicum shrub, while *nara shi hi* refers to the onoto tree (*Bixa orellana*).

Thotho refers to any kind of vine or creeper, such as *hura thotho*, 'vine of malaria', as mentioned above.

SOME classifiers indicate types of flower (*na*, *hu*, *-u*, *honokore*), others kinds of fruit (*këki*, *ãki*, *ko*, *maki*). *Ko*, for example, refers to any kind of fruit which is round with a hard shell, for example *hawari ko*, Brazil nut. Other classifiers clarify which part of the plant is used by the Yanomami, such as *natha*, which refers

to bark from which it is possible to make strings or hammocks. Examples include *yãri natha hi*, *iwa natha hi*, *seisei natha hi* (species of Annonaceae) and *nikreterima natha hi* (a species of Flacourtiaceae).

WITH these few examples I wanted to highlight how important the preservation of language is to safeguarding the knowledge of cultures with oral traditions. The loss of a single word can cause the loss of precious information.

POLITICAL BACKGROUND

FOR the first time in the history of Venezuela, indigenous peoples had, in 1998, the chance to elect three of their members as representatives in the new National Assembly. The principal function of this new assembly was the elaboration of a new constitution, which was approved one year later, in 1999. In the preamble of this new constitution it is clearly established that Venezuela is a multiethnic and pluricultural country. In chapter VIII, dedicated to the rights of indigenous peoples, two articles are worth noting:

ARTICLE 121

This recognises the right of indigenous peoples to have their own education, that is to say, the right to maintain and develop their cultural identity (cosmogony, values, spirituality, social organisation and economic system) generally related to a specific conception and use of nature. In addition, it underlines that the state must promote the cultural manifestations of indigenous peoples and support an intercultural and bilingual educational system, respectful of their socio-cultural differences and their traditions.

ARTICLE 9

This declares the official status not only of Spanish but also of all the indigenous languages spoken in Venezuela.

Medicinal plant: *haro këki*



ON 14 May 2001, the National Direction of Indigenous Education was created in the Ministry of Education, and the responsibility of this direction was given to a teacher, a member of the Wayuu people, the most numerous ethnic minority of Venezuela. This new institution has the difficult mission of not only promoting and enhancing the use and teaching of indigenous languages, but also that of preserving and revitalising those which are severely in danger of extinction.

ON 29 May 2002 a presidential enactment promulgated the obligatory use of indigenous languages:

ARTICLE 1

The use of the indigenous languages in their oral and written form is obligatory in the public and private educational centres, not only those located in the indigenous communities but also in all rural and urban areas inhabited by indigenous peoples, in all the levels and modalities of the educational system.

AT the same time (29 May 2002) the National Council of Education and Indigenous Languages was created, presided over by the Director of Indigenous Education, mentioned above, and composed of a representative from each indigenous group. The delegates, who must have knowledge and experience in pedagogic and linguistic programmes, will be chosen according to the respective traditional mechanisms of selection of each indigenous group. This council, which includes also a few experts or technical advisers in linguistics and pedagogy, has several functions which partly coincide with those of the Direction of Indigenous Education. However, one of its most important tasks is to prepare the foundations of a new Law of Indigenous Education, which is still in process.

ON 3 August 2004, a final enactment created the Presidential Commission 'Guaicaipuro Mission':

ARTICLE 1

The Presidential Commission "Guaicaipuro Mission", is created with permanent character, the function of which will be: to coordinate, promote and advise all the matters referring to the restitution of the rights of the indigenous peoples and communities.

THE functions of this new institution are still matters of discussion because of the heterogeneity of its members and the vagueness of its programmes in relation to those of the other institutions mentioned above.

RECENTLY, in January 2007, the Ministry of Indigenous Affairs was created. A woman who is a member of a Ye'kuana community was appointed to this important post. The organisation chart has been proposed, but the budget required for its functionality has not yet been approved. A new indigenous bureaucracy (seven vice-ministers, responsible for different areas and different ethnic groups) and a set of indigenous civil servants must be nominated. The creation of this department obliges the restructuring of already existing indigenous institutions. However, it is still too early to make an appraisal and measure the consequences of these structural changes.

MORE recently (January 2008) a Law of Indigenous Languages was prepared by the Commission of Indigenous Peoples of the National Assembly, and will soon be discussed by the assembly. This new law proposes the creation of a National Institute of Indigenous Languages, which should be a dependency of the Ministry of Education.

IN short, in the last decade, the indigenous minorities of Venezuela have

conquered their linguistic, cultural and political rights, by means of new laws and several new bodies charged with enforcing these laws.

INDIGENOUS EDUCATION

THE very concept of 'indigenous education' is complex, multiform and many-sided, insofar as it is supposed to respond to the nuances and differences of each indigenous culture. Presently, the situation of Venezuela's indigenous peoples is heterogeneous and unbalanced – some groups have extremely dynamic knowledge systems from many points of view, while others are in severe danger of extinction (Mattéi Muller 2006; Mosonyi 2003). Moreover, in indigenous education, the transmission of knowledge is not reduced to the classroom; it is rather a matter of collective compromise. So which means and which strategies can be implemented, at school and out of school, to conciliate these requirements?

INTERCULTURAL BILINGUAL PROGRAMME (IBP)

ONE of the first measures taken by the Direction of Indigenous Education was the remodelling of the Intercultural Bilingual Programme, which has been in abeyance for twenty-eight years, since 1980 (Eguillor García 1991). The Venezuelan Government originally launched the initial Intercultural Bilingual Program (IBP) to promote indigenous languages. Schools were created in indigenous villages, in which indigenous children would be taught how to write and read their mother-tongue as well as Spanish, the only

official language of the country at that time. Considering that many indigenous communities were still monolingual at that time, it seems that the real purpose of the IBP was to create a new generation of bilingual Indians (Spanish and the indigenous language), who could be assimilated more easily into the national culture. In fact, the main criterion to be taken on as a school-master in an intercultural bilingual school was to know basic Spanish, in addition to the indigenous language. However, the requirement was only for a primary school level of education in Spanish, and most of the indigenous school-masters could not write and read fluently in their native language, because they had not been trained. Three years later, in 1983, the IBP entered a dormant phase because of a drastic reduction in its budget. Overall, its implementation has been very slow, partial, unequal and deficient in many aspects due to the lack of appropriate didactic material in indigenous languages, untrained schoolmasters and want of supervision and continuity.

MOREOVER, only a small number of indigenous peoples could take advantage of this programme. To be able to attend the school system, potential indigenous pupils had to live close to a religious mission (catholic or evangelist) where the indigenous schools were created. At that time, the missionaries were the only non-indigenous persons who could guarantee a permanent presence in these remote areas and at the same time assume the teaching of basic Spanish. In some cases, the pupils had to live far from their villages, in boarding schools (in Esmeralda, Raton Island or San Juan de Manapiare for example, in the Amazon State), which grouped

together children coming from different ethnic backgrounds. In addition, they could not benefit from long excursions in the forest, traditionally practiced by their groups in order to gather more food (wild fruit, tubers and edible insects, such as caterpillars, termites and ants), to look for useful plants (medicinal and hallucinogenic ones among them) or explore new areas for their gardening and hunting.

IN some ways, the first IBP had a negative impact because it created a rupture in indigenous societies between those who know how to speak and write Spanish and those who do not. Those who were excluded from the IBP were the adults and older people, the shamans, most of the girls and all of the communities which were isolated in the forest; in other words, those who are the best guarantors for traditional knowledge of nature. Today, the indigenous school-masters who are the product of this first IBP are more or less bilingual, quite acculturated and not necessarily well prepared to transmit the traditional knowledge of their group. To remedy this situation, several strategies have been set up by the Direction of Indigenous Education:

- 1 Reinforcement and extension of the Intercultural Bilingual Programme (IBP);
- 2 Community participation;
- 3 Creation of new cultural/linguistic niches;
- 4 Revitalisation of moribund languages;
- 5 Workshops on awareness-raising in urban areas.

1/ REINFORCEMENT AND EXTENSION OF THE INTER-CULTURAL BILINGUAL PROGRAMME (IBP)

PRESENTLY, in indigenous areas there are still fewer intercultural bilingual schools than other kinds of schools. The efforts of the Direction of Indigenous Education concentrate on two points. Firstly, indigenous school masters should be better trained and should have finished secondary school. They should follow special training in linguistics, particularly in phonetics and phonology so that they can teach their native language more efficiently. Today there are 5,900 indigenous school-masters but not all are incorporated in the IBP and only 1,400 of them have been trained. Secondly, school books in indigenous languages are still rare and some are too obsolete, poor and fragmentary. Therefore, the Direction of Indigenous Education is stimulating the elaboration of pedagogical grammar books, reading textbooks and bilingual dictionaries. Texts for indigenous schools have been published during the last five years and several bilingual books are in preparation, with the collaboration of indigenous school masters.

2/ COMMUNITY PARTICIPATION: WAPIRE

FOR many reasons the young school master is not always the most appropriate person of his or her village to transmit traditional knowledge, as discussed above. Therefore the Wayuu People are experimenting with a new formula: the *Wapire*, which in Wayuu means 'meeting place'. This is a regular meeting, which takes place in a primary school or a place built or set up for this purpose, during

which the older women and men of the village intervene and talk with the children about the Wayuu culture. There are presently five *Wapire* in the Guajira area, in the western part of Venezuela where the Wayuu live. This approach is intended to reinforce and complement the work of the school master through the narration of myths or tales, the description of ritual ceremonies, and the presentation of ethnic codes and the group's social organisation.

THE underlying purpose of these efforts is to turn the school into a vital centre of the community, in which all the active agents of the community, men, women, young, elderly, parents and relatives, participate with the school masters in the educational process of the children. In this way, the transmission, and in some cases the reconstruction, of the indigenous culture becomes a matter in which all of the community participate.

3/ CREATION OF LINGUISTIC/ CULTURAL NICHE (NUCLEI)

THE linguistic/cultural niche is a system that facilitates the direct transmission of knowledge. It is intended for children divided into two age classes (0 to 3 years and 3 to 6 years), and is led by indigenous women, mothers, grandmothers or any other indigenous women selected by the community. It is not reduced only to the task of teaching the mother tongue, but is extended to different aspects of the indigenous culture. The location of the niche makes it particularly interesting: it is installed in an indigenous home, accommodated and suited for such purpose. It is a form of initial (pre-school) education which must be planned in coordination with the Intercultural Bilingual Program, under certain conditions:

A/ When the indigenous village presents complex cultural and linguistic heterogeneity (this is the case for several communities on the Orinoco riverside near Puerto Ayacucho, capital of the Amazon State, and in the very south along the Rio Negro, where in the same village five or more different languages and cultures coexist).

B/ When the use of the indigenous language by children between 3 and 6 years old is increasingly reduced. In this case, the niche can prepare the child to be able to follow the Intercultural Bilingual Program later.

TODAY there exist nineteen linguistic/cultural niches throughout the Venezuelan territory. According to the Direction of Indigenous Education, this model of 'the niche', which has been experimented with in other countries with indigenous populations, could constitute the most appropriate solution for most minority groups. However, up to the present the results have not been very satisfactory because of the isolation of the niches and the consequent difficulty of supervising and stimulating them.

4/ EXPERIENCE OF REVITALISING MORIBUND OR EXTINCT LANGUAGES: THE CASE OF THE AÑU LANGUAGE

DUE to the new political background described above, several ethnic reaffirmation movements surged in Venezuela among groups previously considered moribund, such as the Añu, or virtually extinct, such as the Chaima. In these groups, the intergenerational transmission process has been interrupted and the recuperation of the language through the technique of the linguistic

niche is no longer feasible because there are no fluent speakers of the indigenous language. The Añu, or Paraujano, whose language belongs to the same arawak family as the Wayuu and who live in the same area as the Wayuu, have created the Paraujano Cultural Movement (Movimiento Cultural Paraujano – MOCUPA) and in spite of serious difficulties due to the lack of native speakers, their leaders have advocated the revitalisation of their native language from written texts on this language. With the financial support of UNICEF, an initiation course elaborated from published linguistic material on Añu was organised in 2003 by two linguists from the University of Maracaibo. There were thirty participants, comprised of school masters of the Añu area and members of MOCUPA, only 30 per cent of whom have an Añu origin. This experience proved highly motivating and led to the creation of a group whose main purpose is the elaboration of pedagogical handbooks for schooling children of the Añu communities. A similar process is underway with the Chaima, a Carib group of the eastern region of Venezuela. Even if these experiments have a limited impact, they nevertheless constitute a significant contribution to the survival of these cultures.

5/ WORKSHOPS ON 'AWARENESS-RAISING' IN URBAN AREAS

FORMERLY, the IBP was implemented only in rural areas. However, comparison between the censuses of 1992 and 2002 shows that a significant proportion of Venezuela's indigenous population has moved from rural to urban areas. It also appears that some rural areas were converted into urban ones,

absorbing indigenous villages. For this reason the Direction of Indigenous Education considers that a special effort should be made in urban areas, where there is a minor percentage of illiterate indigenous people. One such effort is an attempt to open intercultural bilingual classes in urban areas. This was possible in Zulia with the Wayuu people, the majority of whom live in the suburbs of Maracaibo, the second biggest town of Venezuela.

A NEW VISION OF INTERCULTURALITY & VENEZUELAN IDENTITY

THE entire Venezuelan educational system is presently subject to comprehensive revisions. A new organic Law of Education is under consideration in the National Assembly, which includes the Law of Indigenous Education. An important point is postulated in the preliminary discussions concerning these laws: a new approach called 'interculturality'. This 'interculturality' is no longer conceived as a specific component of indigenous education, it is now presented as a fundamental component of the entire Venezuelan educational system. Accordingly, interculturality becomes the defining feature of the Venezuelan identity. Alongside the European immigrant groups (Spanish, Portuguese and Italian in particular) and the Afro-Caribbean cultures, which played and still play a fundamental part in the formation of the Venezuelan identity, there is today the recognition of an indigenous foundation which must be preserved and known by all. Therefore, indigenous knowledge in general, and indigenous languages in particular, have been declared 'national patrimony'.

ACCORDINGLY, several strategies are used to diffuse information on this patrimony to the entire population. A new public television channel, created three years ago, gives an important space for the projection of numerous documentary films on different aspects of indigenous cultures (ritual celebrations, handicrafts, practices, musical performances and legal claims). Very short micros (films of just a few minutes in length) also display images of the daily life and the environment of indigenous groups. Interviews, shows and events on indigenous topics are regularly presented on different television channels. A series of twenty documentary films for television, dedicated to twenty ethnic groups, was also created with the financial support of the Ministry of Culture.

THE Ministry of Education has also launched an active editorial policy with the publication of new text books for all Venezuelan schools, with the purpose of giving a new image to indigenous cultures. An illustrated bilingual series for children, based on indigenous myths (Warao, Yukpa, Piaroa, Ye'kuana, Añu, Wayuu, E'ñepa, Kari'ña and Yanomamí) and accompanied by a CD, which plays the text in the indigenous language and in Spanish, is presently sold in bookshops. It is targeted at any kind of infantile public, indigenous as well as non-indigenous.

HEALTH AND LAND SITUATION

IN addition to education, a policy of cultural preservation needs to address health issues and land rights and access in indigenous areas. These two points – health and land – are spearheads of the Venezuelan Government's policy.

HEALTH PROGRAMME: THE CASE OF THE YANOMAMÍ PEOPLE

THE health situation of the Yanomamí has been deteriorating during the last thirty years (Colchester 1985). There are epidemics of malaria and hepatitis in their territory. The infant mortality rate is very high (over 50 per cent, and even greater still in some areas) and the population censuses of 1992 and 2002 show an imbalance between men and women, with women being less numerous than men, which has an impact on demographic growth.

IN the Yanomamí culture, knowledge of medicinal plants is more the privilege of women than of men, whereas shamanism, which is so important to an understanding of the Yanomamí conception of nature in the broad sense of the term, including the conception of the human body and illness, is the reserve of men. These fundamental components of the Yanomamí health system are generally ignored by the young medical doctors who start their careers in indigenous areas. This indifference by the doctors towards traditional practices is sometimes felt by the Yanomamí to be an offence against their beliefs but, in some more acculturated communities, it has produced a weakening of traditional knowledge, a loss of confidence in traditional remedies and worse, an abandonment of them. However, in January 2007, the Intercultural Coordination of Health with Indigenous Peoples, a new department of the Ministry of Health directed by an indigenous woman who is also a medical doctor, presented an ambitious health programme exclusively dedicated to the Yanomamí people, which will receive significant funds for its execution.

ONE of the specific objectives of this project deserves our attention (MSDS 2005):

The setting-up of a continuous intercultural dialogue which allows us to take advantage of the knowledge, technology and skills of the Yanomamĩ and the non Yanomamĩ... the complementarity between the traditional health systems and the biomedical ones... will be promoted...

IN order for this to occur, special training and information regarding the role of some traditional practices and the necessity of respecting them must be given to doctors who work in the medical centres installed in indigenous lands. This is the key to a more harmonious and efficient cooperation with the community. If this new approach reaches its goal, it could be a great asset, able to guarantee a better health for the Yanomamĩ without excluding their own knowledge.

LAND SITUATION

IF we want to safeguard the knowledge of nature held by indigenous peoples, it is necessary to guarantee them the use of the space in which they experiment and enrich their knowledge. This space must be granted according to their traditional criteria of territorial occupation; the areas they used for cultivating, hunting, fishing and gathering.

DURING the last twenty years the Venezuelan Government has been creating protected areas called ABRAE (Area Bajo Régimen de Administración Especial: Area under a special administration system) generally located in indigenous lands. To give one significant example, in the Amazon State in which the indigenous peoples represent more than 50 per cent of the population, the ABRAE occupy approximately 50 per cent of the state (Carrillo and Perera

1995). They are composed of four national parks, nineteen natural monuments, one hydrographic basin, one forest reservation and one biosphere reserve, which is the most extensive in the world (Arévalo-Jimenez 1984; Colchester and Fuentes 1983).

THE spatial distribution of the ABRAE has been an efficient brake to mining or timber exploitation in some areas. However, the supervision and control of all the ABRAE has been impossible, and recently cases of violation of the ABRAE regulation have been highlighted and denounced. The situation in the forest reservation of Imataca in the eastern and southern part of Venezuela (Delta Amacuro and Bolivar State) on the border of the Guayanese Shield, is one of the most controversial cases. This huge reserve of 11 million hectares is unique for its biological diversity and its splendid natural beauty, but chiefly it is valued for its mineral resources (gold, diamond,



©Marie-Claude Muller



©Marie-Claude Mattei-Muller

Aerial view of a Yanomami settlement (small circle in the middle of the forest)

Part of a Yanomami collective house (left)

copper, bauxite and manganese), for its precious woods and for its water. Several indigenous communities belonging to different ethnic groups (Warao, Pemón, Kapón, Kari'ña and Arawak) live here. However, in 1963 a presidential order delimited an important area of 3.8 million hectares for wood exploitation and mining, without a planning process. In 1997 the Venezuela Government put out a new order to control the unauthorised exploitation of resources and facilitate industrial and legal exploitation. Several mining concessions were given to transnational companies which

intensified the gold extraction and accelerated the destruction of the forest reservation. The new constitution of 1999 (Art. 127) states:

The State must protect the environment, the biological diversity, the genetic resources, the ecological processes, the national parks, the natural monuments and other areas of special ecological importance...The State will implement a policy of territorial planning, in harmony with sustainable development, which includes information, consultation and participation of the community.

NEVERTHELESS, nothing was done to drastically change this situation. In fact, on 7 September 2004, in spite of the protestations of a group of ecologists and anthropologists, an enactment ordered a new plan regulating the use of the Imataca Forest Reservation (62 per cent for timber exploitation and 12 per cent for mining) whilst

maintaining all the concessions given to transnational companies in 1997.

REFERRING to indigenous lands, two laws were enacted: on 12 January 2001, the 'Law of delimitation and guarantee of the habitat and lands of indigenous people' and then on 9 August 2001 the creation of a 'National Commission for the delimitation of the habitat and lands of indigenous peoples and communities' in which indigenous peoples are represented by eight delegates. The delimitation of these lands is in process, but comes up against many difficulties because, after so many years of migration, the territories of the different ethnic groups overlap and parts of these lands are today occupied and exploited by non-Indians. In these conditions, it is not easy to decide where an indigenous territory begins and where it finishes.

CONCLUSION

FROM a strictly political and legislative point of view, Venezuela has made a quantitative and qualitative jump regarding the safeguarding and the diffusion of indigenous languages and cultures. Moreover, the present government has ratified various important international agreements concerning indigenous peoples. On 22 December 2000, the National Assembly approved the Agreement N° 169 of the ILO on 'Indigenous and Tribal Peoples in Independent Countries'. Concerning the preservation of nature, it has renewed its membership to IUCN (the World

Conservation Union) and it signed the Kyoto Protocol in November 2004, but still the difficulties are numerous. There are an excessive number of institutions which are supposed to work in the same direction, but do not necessarily collaborate or complement each other (sometimes due to the co-existence of old and new organisations) and there is a lack of articulation between all the national and regional institutions involved in these programmes. The deficient training of the indigenous authorities and the conflicts of power and interest among the indigenous peoples

themselves (problems of leadership within and between the communities, as well as between indigenous peoples in the different indigenous organisations) remain great obstacles and hindrances. The indigenous peoples have not yet formed a cohesive and homogenous force because of their linguistic and cultural diversity, their demographic inequality, their geographic isolation in areas where the communication system is still deficient or missing, and the divergence in the management of their political and economic relations with the national society. For example, it is difficult for a Yanomami in the Upper Orinoco to recognise the leadership of the mayor of their municipality, as the mayor is a member of another indigenous group. One thing is sure: the present government has given them the possibility of expressing their voices, claiming their rights and managing their land, as never before. Some indigenous leaders are aware of the great responsibility they have to seize and exploit these opportunities. One leader stated at a meeting in the Ministry of Education, 'That's enough talk about the five hundred years of oppression. Now we have to ask ourselves what we, indigenous people, are doing and can do for the defence of our own cultures and languages'. All these changes are still too recent. Venezuela needs a period of maturation and depuration to orientate, coordinate and more efficiently control all its actions in relation to indigenous minorities, as well as to refine its strategies in relation to the preservation of their knowledge, culture and environment.



© Yann Arthus-Bertrand / La terre vue du ciel

REFERENCES

- Aguilera M.**, Azócar, A. and González-Jiménez, E. (eds.). 2003. *Biodiversidad en Venezuela*. Tomo 1. Fundación Polar, Ministerio de Ciencia y Tecnología, FONACIT, Fondo Nacional de Ciencia, Tecnología e Innovación.
- Allais**, M.L. 2003. *Población indígena de Venezuela según los censos oficiales*. Conferencia en la Universidad Católica Andrés Bello, Caracas. (Documento inédito).
- Arvelo-Jimenez**, N. (ed.). 1984. *Reserva de Biosfera Yanomami: Una Auténtica Estrategia para el Ecodesarrollo Nacional*. Caracas: IVIC.
- Carrillo**, A. and Perera, M. (eds.). 1995. *Amazonas, Modernidad en Tradición. Contribuciones al desarrollo sustentable en el Estado Amazonas, Venezuela*. Sada-Amazonas, MARN (Ministerio de Ambiente y Recursos Renovables) GTZ Venezuela Projekt 91.205.10.
- Colchester**, M. and Fuentes, E. (eds.). 1983. *Los Yanomami Venezolanos: Propuesta para la Creación de la Reserva Indígena Yanomami*. Caracas: Fundación La Salle de Ciencias Naturales.
- Colchester**, M. 1985. *The Health and Survival of the Venezuelan Yanomama*. International Working group of Indigenous Affairs (IWGIA), Document 53. Copenhagen.
- CRBV** (Constitución de la República Bolivariana de Venezuela). 1999. *Constitución de la República Bolivariana de Venezuela*. Caracas: Imprenta Nacional.
- Eguilior García**, M. I. 1991. La Escuela Yanomami, modelo de interculturalidad. In *La Iglesia en Amazonas* 53: 40–45.
- Huber**, O., Duno, R., Riina, R., Schaffer, F., Pappaterra, L., Jiménez, A., Llamozas, S., and Orsini, G. 1998. *Estado Actual del Conocimiento de la Flora en Venezuela*. Documentos Técnicos de la Estrategia Nacional de Diversidad Biológica. Ministerio del Ambiente y Recursos Naturales Renovables. Caracas.
- Lasso**, C., Lew, D., Taphorn, D., Donascimiento, C., Lasso-Alcalá, F., Provenzano, F. and Machado-Allison, A. 2003. *Biodiversidad ictiológica continental de Venezuela*. Parte I. Lista de especies y Distribución por cuencas. Memoria Fundación La Salle de Ciencias Naturales 159. Caracas.
- LDPI** (Ley de Demarcación y Garantía del Hábitat y Tierras de los Pueblos Indígenas). 2001. Ley de Demarcación y Garantía del Hábitat y Tierras de los Pueblos Indígenas. Gaceta Oficial No. 37.118 del 12 de Enero del 2001.
- LOPCI** (Ley Orgánica de Pueblos y Comunidades Indígenas). 2005. Ley Orgánica de Pueblos y Comunidades Indígenas. Gaceta Oficial No. 38344.
- Mattéi Muller**, M.C. 2006. Lenguas indígenas de Venezuela en peligro de extinción en *Lenguas y Tradición orales ¿Diversidad en Peligro?* Pp. 283–311. UNESCO Oficina Regional de Cultura para América Latina y el Caribe, Casa de las Américas.
- Mattéi Muller**, M.C. 2007. *Lengua y Cultura Yanomami – Diccionario Ilustrado Yanomami–Español, Español – Yanomami*. 782 páginas. Caracas, Venezuela.
- MSDS** (Ministerio de Salud y Desarrollo Social, Coordinación Intercultural de Salud con Pueblos Indígenas). 2005. Plan de Salud Yanomami, Resumen de la Propuesta.
- Mosonyi**, Esteban. 2003. *La Situación de las lenguas indígenas de Venezuela*. Instituto del Patrimonio Cultural, Caracas.
- OCEI** (Oficina Central de Informática y Estadística). 2005. Censo de Venezuela 2001/2002.
- Steyermark**, Julian. 1972. *Flora de Venezuela*. Instituto Botánico, Dirección de Recursos Naturales Renovables, Ministerio de Agricultura y Cría. Caracas.
- Steyermark**, J.A., Berry, P.E. and Holst, B.K. (eds.). 1995a. *Flora of the Venezuelan Guayana*. Vol. 1. Introduction. Missouri Botanical Garden, St Louis. Timber Press. Portland.
- Steyermark**, J.A., Berry, P.E. and Holst, B.K. (eds.). 1995b. *Flora of the Venezuelan Guayana*. Vol. 2. Introduction. Missouri Botanical Garden, St Louis. Timber Press. Portland.
- Steyermark**, J.A., Berry, P.E. and Holst, B.K. (eds.). 1997. *Flora of the Venezuelan Guayana*. Vol. 3. Introduction. Missouri Botanical Garden, St Louis. Timber Press. Portland.
- Steyermark**, J.A., Berry, P.E. and Holst, B.K. (eds.). 1998. *Flora of the Venezuelan Guayana*. Vol. 4. Introduction. Missouri Botanical Garden, St Louis. Timber Press. Portland.
- Steyermark**, J.A., Berry, P.E. and Holst, B.K. (eds.). 1999. *Flora of the Venezuelan Guayana*. Vol. 5. Introduction. Missouri Botanical Garden, St Louis. Timber Press. Portland.
- Steyermark**, J.A., Berry, P.E. and Holst, B.K. (eds.). 2001. *Flora of the Venezuelan Guayana*. Vol. 6. Introduction. Missouri Botanical Garden, St Louis. Timber Press. Portland.
- Steyermark**, J.A., Berry, P.E. and Holst, B.K. (eds.). 2003. *Flora of the Venezuelan Guayana*. Vol. 7. Introduction. Missouri Botanical Garden, St Louis. Timber Press. Portland.
- Steyermark**, J.A., Berry, P.E. and Holst, B.K. (eds.). 2004. *Flora of the Venezuelan Guayana*. Vol. 8. Introduction. Missouri Botanical Garden, St Louis. Timber Press. Portland.



©Margaret Florey

©Margaret Florey

**SUSTAINING INDIGENOUS LANGUAGES AND INDIGENOUS
KNOWLEDGE: DEVELOPING COMMUNITY TRAINING APPROACHES
FOR THE 21ST CENTURY**
MARGARET FLOREY

INTRODUCTION

CONCERN about the loss of indigenous languages and associated indigenous knowledge that is confronting minority language communities in all corners of the globe has received growing international publicity through the last fifteen years or so. That concern has translated into action in innovative ways, among which are a focus on the documentation of endangered minority languages by linguists, increased support for documentation through the development of new funding bodies such as the Hans Rausing Endangered Languages Project (UK) and the Volkswagen Stiftung (Germany), the instigation of language revitalisation and maintenance projects by language activists, an increase in advocacy and lobbying by organisations such as Terralingua and the Foundation for Endangered Languages, and international safeguarding actions worthily exemplified by the UNESCO Convention on the Safeguarding of Intangible Cultural Heritage.

WITH the urgent need to focus attention on endangered languages, new challenges have arisen for language maintenance practitioners who recognise that documentation is just the first stage in a long process of rebuilding an environment which values and can sustain indigenous knowledge. Linguists and language activists have begun to ask in what ways linguistic fieldwork practice could contribute towards language maintenance activities. In some parts of the world, efforts have begun to turn to the need to build capacity in communities and to empower community members to work on the documentation and maintenance of their languages (Austin

2003; Florey 2004; Hinton and Hale 2001). This in turn has seen further ground-breaking developments, for example, the establishment of training programmes run by organisations such as the Advocates for Indigenous California Language Survival (e.g. Master-Apprentice, Breath of Life/Silent no more), the American Indian Language Development Institute (Arizona), the Indigenous Language Institute (New Mexico), and Oxlajuuj Keej Maya' Ajtz'iib' (a Guatemalan Mayan institute devoted to research and teaching on Mayan languages and linguistics), and the growth of Aboriginal language centres, particularly in Australia and North America. Educational programmes focused on the academic training of indigenous linguists have been introduced — for example, at the University of Texas, USA (The Center for Indigenous Languages of Latin America) and Monash University, Australia (Studies in Language Endangerment). Networks of language maintenance practitioners are being built through organisations like the Resource Network for Linguistic Diversity which aims to share knowledge, strategies and resources.

WITH the increasing use of web-based learning and the web as a publicity tool, these developments are able to reach out to many communities around the world. However they are as yet unable to reach more remote and economically and politically disadvantaged communities. Localised approaches are needed to support the particular language maintenance aspirations and needs of these communities.

THIS paper outlines an approach that has been developed to support indigenous languages and the transmission of indigenous knowledge in small and

resource-poor communities in eastern Indonesia. Section 2 discusses disruption to intergenerational transmission and the linguistic ecological framework. I propose that, in some settings, processing grief and shame deriving from language and cultural losses is a necessary precursor to stabilising the linguistic ecology and implementing culturally appropriate revitalisation models. Section 3 introduces a case study from Indonesia in which restoration of intergenerational respect is a core component of a new training programme. An overview is given of the languages of Central Maluku (Moluccas) and the research communities that are the focus of this project. This section examines traditional modes of transmission of indigenous knowledge and disruption to these modes under the pressure of modernisation in post-colonial Indonesia. Section 4 then discusses features and outcomes of the training programme.

DISRUPTION TO LANGUAGE TRANSMISSION

HIMMELMANN (2009) distinguishes between the symptoms and the actual causes of language obsolescence. Symptoms are the directly observable indications that use of a given language is declining in a speech community. Breaks in intergenerational transmission are the most visible symptom of language shift. For example, Steinhauer (1996: 1) proposes that 'a language... is probably irreversibly endangered when the original language is no longer passed on to new generations'. Fishman (1991) postulated an eight stage continuum of language endangerment in which Stage 1 denotes stability and language maintenance with language use by higher levels of government and in higher education.

The domains of language usage shrink through stages 2 to 5. Intergenerational transmission breaks down in Stage 6 and is evident in Stage 7 with only adults beyond childbearing age speaking the language. Stage 8 characterises severe language shift with only a few elders speaking the language.

DESCRIPTIONS of language shift scenarios internationally have highlighted specific factors that are implicated in the process, and which can lead to breaks in transmission. Some of the widely cited factors which have been analysed as causal in different settings are: population dispersal and forced relocation, removal of children to boarding schools, migration, population decimation through war and disease, changes in political and/or economic power, intermarriage, conversion to non-indigenous religions, globalisation and the accompanying introduction and spread of languages of wider communication (LWC), education only through the medium of an LWC, and punishment for speaking indigenous languages (Florey 2005a; Linn et al. 2002).

ECOLOGICAL APPROACHES TO INTERGENERATIONAL TRANSMISSION

THE literature on language endangerment highlights the repair or restoration of paths of transmission as the essential key to reversing language shift (Fishman 1991, 2001). Initially, much effort in this field focused around the goal of establishing school language programmes. This step was seen as crucial to the creation of a new generation of speakers. However, through the past decade there has been a deeper understanding that this strategy, while important, cannot by itself succeed

in reversing language shift. Repair of paths of transmission fundamentally involves all generations. Reversing language shift requires (re)building a wider speech community to broaden the domains and contexts for use.

THE ecological framework developed by Haugen (1972) and expanded by Mühlhäusler (1996) provides a more holistic perspective. Mühlhäusler contends that ‘ecological factors bring languages into being, define their boundaries and decide on their growth and survival’ (1996: 3). Disruption to one part of the ecosystem, it is argued, will disrupt other parts and may result in their loss. This framework is part of the growing knowledge base concerning the interrelationship between linguistic, cultural and biological diversity and the role which indigenous languages play in the transmission of indigenous knowledge (see, for example, the papers in Maffi 2001). A stable ecosystem is seen as a precursor to the maintenance of indigenous knowledge and linguistic and cultural diversity. The bottom-up approach promoted by Mühlhäusler (1996) and Nettle and Romaine (2000) involves stabilising or restoring the ecosystem first before implementing formal programmes such as school language classes. Resources (both human and economic) should first be deployed towards bottom-up strategies to safeguard transmission before deploying resources towards top-down strategies.

IN Fishman’s eight-stage model, school language programmes become essential only at Stage 4. Nettle and Romaine (2000) follow Fishman in suggesting that once a language is at stages 7 or 8, the chances of success for programmes outside the domain of the home are quite limited. They assert that

‘Schooling comes after intergenerational transmission is secure and reinforces the home-community network, rather than vice-versa’ (2000: 187). Hinton too stresses that school programmes support only one aspect of the language revitalisation process and that ‘bringing the language back as the first language of the home is the true heart of language revitalisation’ (2001: 182).

LANGUAGE NESTS

THE most successful models of language revitalisation are those which are also taking a holistic approach — focusing on intergenerational transmission, targeting the parent and child generations in language learning, embedding language learning in culturally appropriate contexts, and drawing on indigenous methods for teaching and learning. The language nest model in operation in New Zealand and Hawai’i is the best known example of these strategies in action (Benton and Benton 2001; Benton 1996; King 2001). Language nests are a form of immersion programme which begin with young children at pre-school age. The nests often take place in a home-like environment rather than a formal learning environment. A small group of children comes together in a family atmosphere through the week to be cared for by older people who are speakers of the target language. The grandparent and grandchild generations come together to replicate or repair intergenerational transmission. Reyhner (1999: viii) and Anonby (1999) discuss the commitment which is required of parents in this programme to learn the language alongside their young children. This commitment, which is a condition of entry to some language nests, ensures that the child’s developing language

skills can be supported outside of the nest and be used in the home domain with parents.

LANGUAGE nests thus imitate traditional and culturally appropriate means of raising children which help to ensure that cultural learning is taking place alongside language learning. Benton and Benton (2001: 444) identify Maori as *Tangata whenua* ‘people of the land’ and propose that ‘to succeed, a strategy aimed at restoring “language in culture” may also have to include “language with the land”’. In a discussion of language nests, Fishman (1991: 238) points out that ‘What is additionally significant is that this care is not only provided entirely in Maori but that it is provided at a time in children’s language socialisation when English-speaking society and culture have not yet strongly impacted their lives’. That is, early language socialisation in Maori provides an opportunity to begin restoring Maori cultural practices and to sustain indigenous knowledge.

STABILISING SOCIOCULTURAL AND LINGUISTIC ECOLOGY

IN the best cases, the methods used in language nests and similar models become mutually sustaining. The cultural relevance of the programmes enhances the chances of good learning outcomes. The cultural context reinvigorates the culture while revitalising the language. The process of bringing the grandchild and grandparent generations together in a caring learning environment helps to restore respect for the knowledge of elders.

IN some settings, however, language revitalisation programmes (such as language nests or the master–apprentice

model) cannot successfully be introduced until a stronger foundation has been built within a community. This is the case in settings where disruption to the culture has affected attitudes towards elders, and elders’ attitudes towards their own knowledge and expertise. In such cases, social and political changes mean that the elders may no longer hold a clear role in the community and may have begun to devalue their knowledge. Ensuing emotions such as low self-esteem, shame and grief stand as impediments to the restoration of intergenerational transmission of language and indigenous knowledge. These factors have been discussed for settings as diverse as Africa (Crawhall 2004, 2005), North America (Hinton 1994; McCarty and Watahomigie 1999) and Indonesia (Florey and Ewing f.c.). Wong Fillmore (1991) has written about the social costs of ‘language-in-culture’ loss which are observed internationally manifesting in, for example, drug and alcohol abuse, family violence and premature death.

FOLLOWING the linguistic ecological framework, restoration of a stable sociocultural and linguistic ecology is a necessary component of a language revitalisation model in such communities. From this perspective, language revitalisation and renewal are seen as part of a wider process of healing. The following sections discuss a case study from Indonesia in which restoration of intergenerational respect is a core component of a new training programme.

CENTRAL MALUKAN LANGUAGES

WITH 10.73 percent of the world’s languages, an Ethnologue analysis (Gordon 2005) ranks Indonesia second only to New Guinea in terms of number of

languages and twenty-sixth in terms of linguistic diversity. Ethnologue (ibid.) suggests that there are 737 living languages in Indonesia while Steinhauer (2005: 68) gives a more conservative estimate of 500 Austronesian and non-Austronesian languages. Some 128 languages are spoken in the geopolitical region of the Malukan islands in eastern Indonesia (see Map 1), including 111 Austronesian languages and 17 non-Austronesian languages.

LANGUAGE DOCUMENTATION

FOUR languages in Muslim and Christian ethnolinguistic communities in central Maluku are currently being documented by team members in the Endangered Maluku Languages Project, based at Monash University, Australia. The project embeds capacity building within all aspects of documentation activities. Documentation and training with members of these communities are taking place both in the Indonesian homeland and among the population of Malukans who have lived in the Dutch diaspora since the 1950s (Florey and van Engelenhoven 2001).

ALUNE has been the subject of intensive grammatical and sociolinguistic documentation by the author over the past fifteen years. This ethnolinguistic group lives in twenty-six villages in western Seram Island, stretching from the north coast through the traditional mountain territories to the south coast. There is perhaps a total 10,000 speakers of Alune, ranging from older fluent speakers to younger people with some receptive ability. Linguistic vitality is greatest in the more isolated homeland territories in the rainforest interior of Seram, and Alune is endangered in north and south coastal villages.



MAP 1

Indonesia, showing the Maluku region

ALLANG, currently being documented by Michael Ewing, is reportedly the only Christian village on Ambon Island in which an indigenous language survives to any extent (Collins 1982). Ewing's recent fieldwork indicates that, like *Kouro*, perhaps two percent of the population of some 4,100 people are fluent speakers of Allang. Testing of linguistic vitality also indicates that some middle-aged members of the community retain some knowledge of the language (Musgrave and Ewing 2006). This language has a larger speaker population in the Muslim villages of Wakasihu and Larike.

SOU Amana Teru ('language of three villages') is a name recently developed to refer to the language spoken in the Muslim villages of Tulehu, Tial and Tengah-tengah at the eastern end of Ambon Island. Simon Musgrave's current research indicates that of a total population of approximately 19,000, the language has perhaps 10,000 fluent speakers and a further 6,000 community members who have at least some receptive ability.

KOURO 'language' is used to refer to a language being documented by the author in south central Seram Island. This language is indigenous to the five villages of Amahei, Rutah, Makariki, Soahuku and Haruru. An estimated 2 per cent of the population

of 2,300 people in the Muslim village of Rutah are fluent speakers of *Kouro* (Florey 2006a). The language is moribund in the three Christian villages of Amahei, Makariki, and Soahuku, with a total of no more than five elderly speakers.

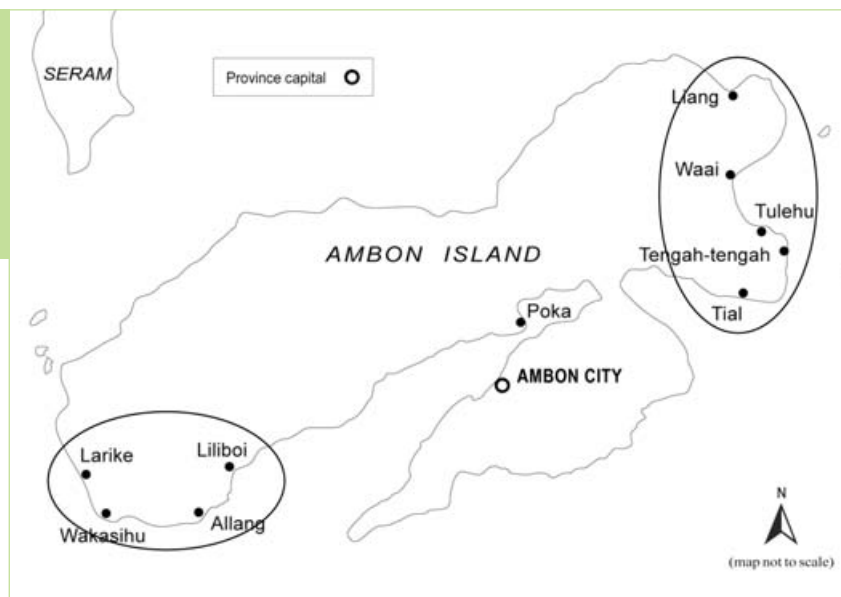


MAP 2

Seram Island, showing the location of Alune and Kouro research sites

MAP 3

Ambon Island, showing the location of Allang and Sou Amana Teru research sites



LANGUAGE SHIFT IN MALUKU

THE fourteen islands of central Maluku are characterised by high linguistic diversity and face the most serious language endangerment in Indonesia (Florey 2005b, 2006b). Language endangerment has its longest history on Ambon Island, home to the regional capital of Ambon City, and the neighbouring Lease Islands of Haruku, Saparua and Nusalaut. Currently, language endangerment is impacting most intensely on the languages of Seram Island, which is linguistically the most diverse island in the region. Florey and Ewing (f.c.) discuss the transformative effect on attitudes towards indigenous languages of the civil conflict and sectarian violence fought from 1999–2002 in the (then) province of Maluku.

LANGUAGE endangerment in Maluku has been attributed to centuries of contact with non-indigenous peoples through colonisation and intensive trade for spices, and conversion to non-indigenous religions (Florey 2005a). All speakers of Malukan languages are bilingual in the regional creole Ambonese Malay, and the majority are also fluent speakers of Indonesian. Both languages are also implicated in the process of language endangerment (Florey and Ewing f.c.). Ambonese Malay has a long-standing role as the regional lingua franca and is the dominant marker of regional identity. In the post-colonial era commencing in 1945, the national language,

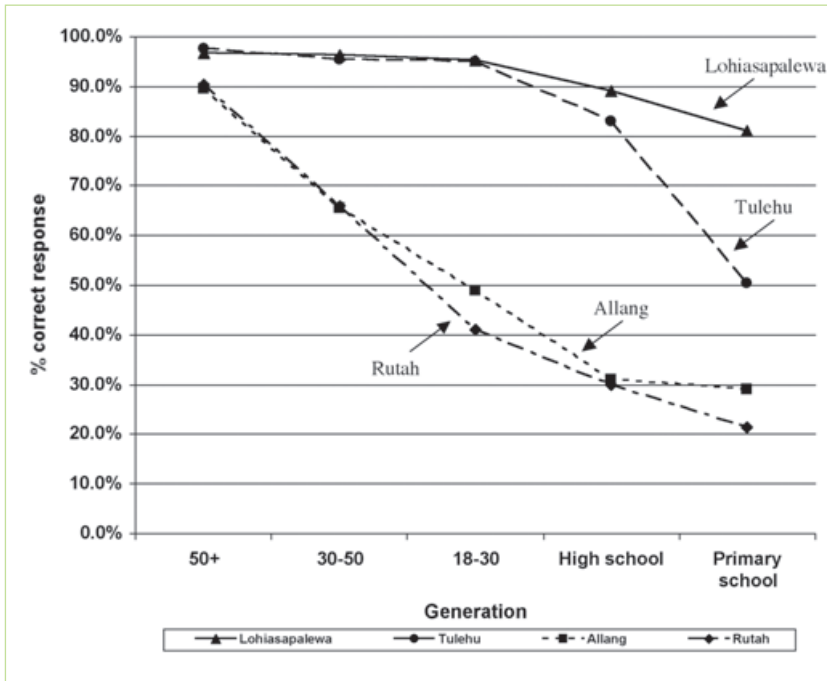
Indonesian, has clearly impacted on the linguistic ecology through its status as the language of education, media and government.

FLOREY (2001) and Wolff and Florey (1998) review the intensive socio-political and ecological changes which have impacted on language vitality and indigenous knowledge among the Alune. Similar changes have impacted over a much longer period on the three other research communities. Both Allang and Tulehu have a long-standing contact history due to their location on Ambon Island on which the regional capital of Ambon City is located. Musgrave (Musgrave and Ewing 2006) also points to the role of Tulehu as a busy inter-island harbour. Similarly Amahei has long been a harbour for south Seram Island, and also has a small landing strip which serves government and private industry. Rutah was formerly known as Amahei Islam, and was located alongside Amahei Christian until the late 19th century, when it was relocated following a destructive earthquake and tidal wave.

LANGUAGE VITALITY & THREATS TO INDIGENOUS KNOWLEDGE

THE process of language shift is being evaluated as part of the Endangered Maluku Languages Project. Team members are undertaking assessments of language vitality in all research sites, with test respondents in six age groups ranging from primary school through to the oldest members of the community. The standardised test evaluates receptive, productive and creative ability in the target language. It provides an informed overview of linguistic vitality in a site based on empirical data rather than less formal tools (such as survey, self-reporting or observation). The results allow the team to learn how linguistic ability varies in and between communities on parameters such as age or generation, gender, religious affiliation and specialised individual or community-wide roles.

THE test methodology also permits assessment of intergenerational transmission of indigenous knowledge. The first stage of the test is designed to test



GRAPH 1

Lexical recognition test results

listens to the description and selects a photo that matches it. The researcher or community language worker notes the responses. Graph 1 shows the results of the recognition test from the four research sites (Florey 2006b).

IT has been widely reported in the literature that languages spoken in Christian villages in Maluku are becoming obsolescent more rapidly than languages spoken in villages which historically aligned politically with the north Malukan sultanate of Ternate and converted to Islam. However, in the modern era it is apparent that threats to the transmission of knowledge are felt across the boundaries of religious affiliation (Florey 2006b, Musgrave and Ewing 2006). Graph 1 demonstrates that language shift is advanced in the Christian

receptive ability in the target language. This involves a lexical recognition task in which respondents are shown five sets of photos (totalling fifty-three photos) depicting familiar items from the cultural and physical environment. The photos exemplify a range of semantic domains. (Ethno)botanical photos include bananas, coconuts, taro, nutmeg, betel nut, bamboo, sago, various stages of sago processing, planting and harvesting of rice, an irrigation system, working in the field, and carrying produce home. Tools and weapons include a machete, sago processing adzes, bow and arrow, fruit harvesting tool, implement to mix sago porridge, fire tongs, fish spear, fish trap and baskets. Everyday activities include tool

maintenance, modes of hauling and carrying water, food processing, preparation and cooking, housework and childcare.

THE first set of photos is arrayed in front of the respondent. A taped description of the first item is played twice in the target language. The respondent



Researcher Drs Betty Litamahuputty testing Alune linguistic vitality in Lohiasapawela

village of Allang and Muslim village of Rutah. These villages are following the same trajectory of language shift. The results identify what Dorian has called 'tip' or abrupt transmission failure. 'In terms of possible routes toward language death, it would seem that a language which has been demographically highly stable for several centuries may experience a sudden 'tip', after which the demographic tide flows strongly in favor of some other language' (Dorian 1981: 51). In Allang and Rutah, tip took place between Generation 1 (50+) and Generation 2 (30–50). Twenty-five years later, Muslim Tulehu is following the same path. In this site, tip is taking place between Generation 4a (high school) and Generation 4b (primary school). Gradual language shift is apparent in Lohiasapalewa, and is accelerating towards tip in the youngest generation.

THE researchers draw on the findings to provide feedback to the wider community, raise community awareness about language vitality and language shift, assess language maintenance needs and develop appropriate language learning materials.

INTEGRATING TRADITIONAL & MODERN MODES OF LEARNING IN MALUKU

IN all locations, the social and political changes that are triggering shifts in knowledge and use of language, culture and the environment have also precipitated shifts in modes of intergenerational transmission of knowledge. In earlier times, learning took place through observation, apprenticeship and participation alongside elders. This mode of learning is still evident in some more isolated villages such as the Alune village of Lohiasapalewa. Through the twentieth century, and particularly in the post-colonial era since 1945, learning now takes place primarily through formal education. The shift to formal education has disrupted social relationships, particularly the role of elders and knowledge holders in the teaching and learning process. Teaching is a high status profession throughout Indonesia, from primary school through to university level. The knowledge held by elders has no place in the modern education system, and increasingly, no place in

the wider community. Opportunities for informal, experiential learning have also diminished in recent decades. While most villages have a primary school (grades 1 to 6), few have their own junior or senior high school. Children continuing their education live away from their village. They are removed from daily interactions with the physical environment and opportunities to observe and participate in indigenous cultural practices.

IT is with this background that a training programme has been developed for the specific conditions of this region to support the revitalisation of indigenous languages. The philosophy underpinning the training programme is detailed in Florey (2004). It aims to delimit the role of non-indigenous professionals and empower speakers of Moluccan languages and their descendents to undertake language documentation and implement language revitalisation or maintenance at the grassroots level. At the heart of the philosophy is the integration of modern and traditional modes of learning in order to recognise and value knowledge and expertise across all generations. In this setting, this technique is proving the most effective method to repair paths of transmission.

TRAINING materials (Florey et al. f.c.) were developed for the first week-long residential training workshop which was held in Masohi, Seram Island, in February 2005. The materials draw on local themes which ensure the cultural



Rutah elder Mr Hatab Lewenussa working with a schoolteacher (left) and a Pattimura University lecturer (centre)

Allang elder Mr Oyang de Fretes
in a song-writing session
with Allang apprentices



to work with each other. In a healthy linguistic environment, children learn their language/s through natural processes of language socialisation and language acquisition.¹ Parents neither require nor are given any training to transmit language. However, in a situation of language shift, the processes of transmission and acquisition are disrupted. In Rutah and Allang, for example, there is no longer any setting in which children can acquire their heritage languages naturally. Some younger people (including those at the workshop) aspired to learn their heritage language but had no idea about how to approach and study with elders in the community. Similarly, some of the elders felt deep sorrow that young people were not speakers, but did not understand how to intervene in the process of language loss. It was therefore necessary to teach the elders how to transmit their language knowledge and to teach the apprentices how to become language learners.

skills they brought to the workshop. It was challenging for the elders working in this new setting to see themselves as masters or teachers. A feeling common to this group was that of being overawed by sitting and working with university lecturers and school teachers. It was similarly challenging for the younger people to learn to become students. The process of building mutual respect between these groups is critical to intergenerational transmission and was reinforced at every opportunity. A goal of these early lessons was to strengthen the language groups which might continue in informal settings beyond the life of the workshop.

appropriateness of the lessons. The workshop structure builds teams and networks with all key stakeholders. Decision-makers in government and education were included in the organisation and opening of the workshop. The twenty-four participants were placed in four workshop teams based around four target languages: Allang, Alune, Rutah and Tulehu. Each team was led by a linguist and included two speakers and indigenous knowledge custodians and practitioners, who were usually older community members, although the Alune team comprised younger fluent speakers. Each team also included two younger community members who were non-speakers and language learners, and five of this group were school teachers. The groups thus modeled traditional learning methods with younger people studying in apprenticeship and participation with elders. At the same time, the non-speakers (learners or apprentices) developed an awareness among the elders of the styles and needs of modern learning modes. In addition, there were two regional professionals in each group representing relevant institutions such as the university, state library, museum and so forth. In this way, participants are able to share skills and widen the resource pool of language maintenance practitioners upon whom they can draw.

THROUGH the week, the workshop addressed a wide range of topics, commencing with training the language speakers and language learners in how

THIS crucial step involved encouraging all participants to identify the

¹ provided they have no disabilities which might impede the process.

THE workshop provided a range of core skills in language documentation and language maintenance activities. These included training in the use of recording equipment, elicitation techniques and methods for working with speakers, and techniques for archiving data. Some sessions focused on understanding language variation and language change, taking into account age-based and regional differences. Participants



©Margaret Florey

Language worker Mr Yohanis Soriale (right) testing Alune linguistic vitality in Lohiasapalewa

FOLLOW-UP & FUTURE PROSPECTS

learned about the Austronesian language family and the historical relationships between languages. Sessions on literature production examined genres, audience, language choice and the development of orthographies.

A day-long session trained the participants in developing a project and applying for funding. This session drew on the metaphor of language as an umbrella, encompassing all aspects of indigenous knowledge. Participants were asked to address the focus questions of: What knowledge do I have? What project could I develop with that knowledge? Again the participants faced the challenge of reflecting on their expertise and what they could contribute to language revitalisation. Elders were encouraged to look beyond their language skills to their knowledge of genres of storytelling, ritual practice, and environmental practices. Young people were encouraged to consider their educational and literacy skills, knowledge of technology and how it might be applied in literature production, and their ability to network beyond the village. Both groups began to see how their various skills could come together in language projects.

FOUR groups were then built around the topics in which participants had expressed interest and expertise: agriculture, education, history and literature. A goal of this session was to begin focusing attention on the revitalisation of indigenous knowledge. The groups developed the following projects:

- 1 *Melestarikan bahasa tanah melalui Kamus Pertanian Tradisional* 'Maintaining indigenous language through a dictionary of traditional agriculture'
- 2 *Paket pelajaran bahasa lokal (Siswa SD kelas I-III)* 'Packet for the study of local languages (classes 1-3)'
- 3 *Dokumentasi bahasa-bahasa tanah dalam upacara adat di Maluku tengah* 'Documenting indigenous languages in ritual speech in Central Maluku'
- 4 *Pelestarian budaya dan bahasa Alune yang terancam punah* 'Maintenance of the Alune culture and language that is threatened with extinction'

POSITIVE outcomes began to emerge almost immediately following the 2005 workshop. In December 2005, the author witnessed participants from the Alune group documenting a ritual involving their own and three other villages. The *pela* (inter-village alliance) renewal ritual had not been held for more than forty years, and was thus a very significant event. Language worker Mr Wempi Manakane recorded and photographed the ritual using the equipment the team was given at the workshop (see photo p24), and completed a transcription of the ritual speech the following day. Ewing (*pers. comm.*) reports that the Allang group has applied to the Governor of Maluku for funding to begin language work in their village.

THE workshop discussed in this paper was the first in a series of training workshops. Follow-up was and is considered essential to reinforce the technical and interpersonal skills which were learned at the workshop. In June 2006, the research team held a one-day workshop at the Siwalima Anthropology Museum in Ambon. Community members and Pattimura University staff who had themselves undergone training in the 2005 workshop became facilitators to train museum staff members in language awareness and language documentation strategies.

TWENTY-FIVE Indonesian linguists and community language activists were trained in language documentation techniques in a ten-day training workshop funded by the Volkswagen Stiftung which was held in Bali in July 2006. There were four participants from Maluku (representing the Siwalima Museum, Ambon State Library, Pattimura University and Lohiasapalewa Village) all of whom had taken part in the two earlier training workshops. In order to qualify for participation in a follow-up Volkswagen workshop held in July 2007, the 2006 participants were required to fulfil two criteria: 1) preparation of a research proposal and 2) the recording and transcription of linguistic data. A total of fifteen of the twenty-five participants fulfilled the criteria, including three Maluku participants. Two of the Maluku participants are now collaborating on an Alune project in Lohiasapalewa Village, and one is working on a Haruku project.

IN addition, the training workshops have heightened awareness of language endangerment in Maluku among community members, staff in key partner institutions such as universities, the museum and library, local and regional government, and members of the public. They have greatly increased cooperation between local institutions and language communities, and have resulted in a pool of trained local language activists.

WE consider these are very successful outcomes of the training programme and augur well for the future of local documentation projects. However, it is too early yet to assess the outcome of the training workshops and to determine whether or not they will begin to impact upon intergenerational transmission and ongoing language maintenance activities.

SOME challenges remain, and these should not be underestimated. Language maintenance activities, funding opportunities and training are all too often out of reach of those who most need it. There is an English language focus in many of the major funding bodies and we need to ask how we can cater for non-English speaking communities. There is a need for advocacy in the grant application process. There is also a critical need for wider access to training at various levels and funded support for training activities. It is also very difficult to find publication outlets for training materials and community literacy mate-

rials. Despite these challenges, a sense of excitement and potential has pervaded the training workshops, and many of the participants remain in contact with each other, supporting their aspirations for the future. It is this sense which gives us hope for the future.

ACKNOWLEDGEMENTS

THE research on which this paper is based has been funded by a Major Documentation Project grant from the Hans Rausing Endangered Languages Programme, SOAS, UK (MDP0009), and by an Australian Research Council Discovery Project grant (DP0343379). I am very grateful to my colleagues Michael Ewing, Betty Litamuhuputty and Simon Musgrave, for their feedback and support. I thank the many people in Indonesia and the Netherlands who have assisted us in gathering the data reported here and who participated in training workshops.

Alune language worker Mr Yohanis Soriale during the language documentation workshop in Bali



REFERENCES

- Anonby, S.J.** 1999. Reversing Language Shift: Can Kwak'wala Be Revived? In Reyhner, J., Cantoni, G., St. Clair, R.N. and Parsons Yazzie, E. *Revitalizing Indigenous Language*. Flagstaff, Northern Arizona University.
- Austin, P.K.** (ed.). 2003. *Language documentation and description*, Vol. 1. London, SOAS.
- Benton, R., and Benton, N.** 2001. RLS in Aotearoa/New Zealand 1989-1999. In Fishman, J.A. (ed.), *Can threatened languages be saved?* Clevedon, Multilingual matters. Pp. 423–450.
- Benton, R.A.** 1996. The Maori language in New Zealand education and society. In Mugler, F. and Lynch, J. (eds.), *Pacific languages in education*. Suva, Institute of Pacific Studies. Pp. 209–227.
- Collins, J. T.** 1982. Linguistic research in Maluku: a report of recent field work. *Oceanic Linguistics*, 21:73–146.
- Crawhall, N.** 2004. *!Ui-Taa language shift in Gordonian and Postmasburg Districts, South Africa*. Ph.D. thesis, University of Cape Town, South Africa.
- Crawhall, N.** 2005. The story of !Ui: Causality and language shift in Africa. In Crawhall, N. and Ostler Stellenbosch, N. (eds.), *Creating outsiders: Endangered languages, migration and marginalisation*. Stellenbosch, Foundation for Endangered Languages.
- Fishman, J.A.** 1991. *Reversing Language Shift*. Clevedon, Philadelphia, Adelaide, Multilingual Matters Ltd.
- Fishman, J.A.** 2001. *Can threatened languages be saved? Reversing language shift, revisited: a 21st century perspective*. Clevedon, Multilingual Matters Ltd.
- Florey, M.** 2001. Threats to indigenous knowledge: a case study from eastern Indonesia. In Maffi, L. (ed.), *On biocultural diversity: linking language, knowledge, and the environment*. Washington D.C., Smithsonian Institution Press. Pp. 325–342.
- Florey, M.** 2004. Countering purism: confronting the emergence of new varieties in a training programme for community language workers. In Austin, P.K. (ed.), *Language Documentation and Description*. London, SOAS. Pp. 9–27.
- Florey, M.** 2005a. Overview: the languages of Central Maluku. S. Musgrave (ed.), *Language Contact, Hybrids and New Varieties: Emergent Possessive Constructions*. (Special issue of) Monash University Linguistic Papers, Vol. 4 (1/2).
- Florey, M.** 2005b. Language shift and endangerment. In Adelaar, K.A. and Himmelmann, N.P. (eds.), *The Austronesian Languages of Asia and Madagascar*. London, Routledge. Pp. 43–64.
- Florey, M.** 2006a. Malukan languages. In Brown, K. (ed.), *Encyclopaedia of Language and Linguistics*. London, Elsevier. Pp. 471–473.
- Florey, M.** 2006b. Assessing the vitality of endangered languages in Central Maluku. Linguistic Society of the Philippines and ICAL (eds.), *10th International Conference on Austronesian Linguistics (10ICAL)*. Puerto Princesa City, Palawan, the Philippines.
- Florey, M., and Ewing, M.** f.c. Endangered languages and endangered cultures in Oceania. In Senft, G. (ed.), *Language revitalization in Maluku in the post-kerusuhan era*. Canberra, Pacific Linguistics.
- Florey, M., Ewing, M., and Musgrave, S.** f.c. *Let's study indigenous languages: study materials for the documentation of indigenous languages*. Utrecht, Landelijk Steunpunt Educatie Molukkers.
- Florey, M. and van Engelenhoven, A.** 2001. Language documentation and maintenance programs for Moluccan languages in the Netherlands. *International Journal of the Sociology of Language*, 151:195–219.
- Gordon, R.G., Jr.** 2005. *Ethnologue: Languages of the World*. SIL International, Fifteenth edition.
- Haugen, E.** 1972. *The ecology of languages: essays by Einar Haugen*. Stanford, Stanford University Press.
- Himmelmann, N.P.** 2009. Language endangerment scenarios: A case study from northern Central Sulawesi. In M. Florey (ed.), *Endangered Languages of Austronesia*. Oxford, Oxford University Press.
- Hinton, L.** 1994. *Flutes of Fire: essays on California Indian Languages*. Berkeley, Heydey books.
- Hinton, L.** 2001. Teaching methods. In Hinton, L. and Hale, K. (eds.), *The green book of language revitalisation in practice*. San Diego, Academic Press. Pp. 179–189.
- Hinton, L., and Hale, K.** (eds.). 2001. *The green book of language revitalization in practice*. San Diego, Academic Press.
- King, J.** 2001. Te Kohanga Reo: Maori language revitalization. Hinton, L. and Hale, K. (eds.), *The green book of language revitalisation in practice*. San Diego, Academic Press. Pp. 119–128.
- Linn, M.S., Naranjo, T., Nicholas, S., Slaughter, I., Yamamoto, A., and Zepeda, O.** 2002. Awakening the languages: Challenges of enduring language programs; field reports from fifteen programs from Arizona, New Mexico and Oklahoma. In Burnaby, B. and Reyhne, J. (eds.) *Indigenous languages across the community*. Flagstaff, Northern Arizona University. Pp. 105–126.
- Maffi, L.** (ed.). 2001. *On Biocultural Diversity: linking language, knowledge and the environment*. Washington D.C., Smithsonian Institution Press.

- McCarty, T.L.**, and Watahomigie, L.J. 1999. Indigenous community-based language education in the USA. In May, S. (ed.), *Indigenous community-based education*. Clevedon, Multilingual Matters Ltd. Pp. 79–94.
- Mühlhäusler, P.** 1996. *Linguistic ecology: language change and linguistic imperialism in the Pacific region*. London/New York, Routledge.
- Musgrave, S.** and Ewing, M. 2006. Language and religion: a case study of two Ambonese communities. *International Journal of the Sociology of Language*, 179:179–194.
- Nettle, D.** and Romaine, S. 2000. *Vanishing voices: the extinction of the world's languages*. Oxford, Oxford University Press.
- Reyhner, J.** 1999. Introduction: some basics of language revitalisation. In Reyhner, J., Cantoni, G., St Clair, R.N. and Parsons Yazzie, E. (eds.), *Revitalizing indigenous languages*. Flagstaff, Northern Arizona University. Pp. v–xx.
- Steinhauer, H.** 2005. Colonial history and language policy in insular Southeast Asia and Madagascar. In Adelaar, A. and Himmelmann, N.P. (eds.), *The Austronesian Languages of Asia and Madagascar*. London, Routledge. Pp. 43–64.
- Steinhauer, H.** 1996. Endangered languages in Southeast Asia. (*The study of endangered languages and literatures of South-East Asia, International Workshop on South-East Asian Studies No. 11*. Leiden, KITLV.
- Wolff, X.Y.** and Florey, M. 1998. Foraging, agricultural, and culinary practices among the Alune of west Seram, with implications for the changing significance of cultivated plants as foodstuffs. In Pannell, S. and von Benda-Beckmann, F. (eds.), *Old world places, new world problems: exploring resource management issues in Eastern Indonesia*. Canberra, Centre for Resource and Environmental Studies, Australian National University. Pp. 267–321.
- Wong Fillmore, L.** 1991. When learning a second language means losing the first. *Early Childhood Research Quarterly*, 6:323–346.



TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK) AND BIOCULTURAL DIVERSITY: A CLOSE-UP LOOK AT LINKAGES, DELEARNING TRENDS & CHANGING PATTERNS OF TRANSMISSION

STANFORD ZENT

INTRODUCTION

CONCERNED about the rapid rates of extinction of biological species and human languages throughout the world, environmental scientists, activists and policymakers have recently become interested in understanding the links between biodiversity and cultural diversity. Some scholars maintain that the two kinds of diversity are interactive, interdependent and possibly coevolved, a viewpoint expressed in the emerging concept of *biocultural diversity* (Cocks 2006; Harmon 2002; Maffi 2001, 2005). The implications of this insight for conservation policy are obvious: protection of organic nature and human culture should proceed hand in hand. The hypothesis of biocultural diversity draws support mainly from macro-geographical studies showing a strong spatial correlation between species richness and number of endemic languages when tabulated by country or when plotted on a world map (Harmon 1996; Loh and Harmon 2005; Stepp et al. 2004). Despite this intriguing evidence, the nature and extent of the linkage between diversity in the natural and the cultural realms at smaller spatial scales are still not well understood. Correlation does not necessarily indicate causation and we do not know whether the observed overlaps really reflect mutual determination (e.g. coevolution of ecological communities and human societies over time), asymmetrical causation from one side to the other (e.g. unique cultural adaptations to biogeographical characteristics versus anthropogenically modified landscapes), analogous but independent phenomena caused by third factors (e.g. fragmentation of habitat types and socioethnic territories caused by mountains, islands or climatic conditions), or some combination of these. Moreover, simple counts

of species and languages are not the only possible measures of biodiversity and cultural diversity respectively. A better theoretical understanding of this relationship will require more fine-grained investigations at the empirical and comparative levels.

LOCAL and traditional ecological knowledge (TEK) provides a key window for viewing at close range how the natural environment shapes, penetrates or even permeates human cultural expression and vice-versa. Such knowledge is often intimately tied, on one hand, to local language, social organisation, economic goals, religious beliefs, aesthetics, ritual observances and material culture, and on the other hand, to resource appropriation and management practices, environmental impacts, variety and distribution of natural species, the structure and functioning of biotic communities and long-term landscape modifications. However, the particular substance and structure of these interrelationships may vary considerably by place and group. Thus local-level studies of TEK can contribute to a more coherent understanding of biocultural diversity precisely by documenting the complex, variable and often subtle ways that knowledge is systemically connected to elements of the surrounding cultural and biophysical milieu.

A number of studies in recent years have emphasised the dynamic properties of TEK systems: their adaptability, mobility, reproduction, transformation, innovation, hybridisation, incorporation of non-local knowledge fragments, sensitivity to surrounding factors, fragility in the face of globalisation, and revitalisation efforts (Alexiades 2007; Brodt 2001; Carlson and Maffi 2004; Ellen et al. 2000; Heckler in press; Hunn 1999; Ohmagari and Berkes 1997; Ross 2002; Toledo 2002; Zarger

2002; Zarger and Stepp 2004; Zent 1999). One of the important lessons learned from a dynamic perspective of TEK is that its persistence and resilience over time is critically dependent upon environment and culture specific contexts and customary methods of knowledge transmission. This points to the need for studies of the dynamic patterns and processes of knowledge variation, change, transmission and the local contextual factors affecting these. The transmission process is especially crucial from an *in situ* biocultural conservation standpoint because the reproduction and continuity, or alternatively the transformation and/or loss, of historically-accumulated, culture-specific knowledge from one generation to the next depends on it. Among whom, what, when, where and how is knowledge passed along or acquired in specific cultural and ecological settings? What factors of the local social or ecological setting (e.g. local language, childcare, biotic complexity) most affect its transmission? How are traditional patterns of transmission being affected by changes in the wider social and environmental context? These are some of the questions that need to be answered if conservation measures are to be tailored specifically to fit local situations and equipped to address the problem of knowledge protection. Furthermore, the careful observation and documentation of the empirical facts of knowledge transmission in particular places and peoples will also permit more precise and meaningful comparisons among cases, which should give us a better idea of some of the more general principles and trends in operation.

THE present paper provides an exploration of these issues by examining the dynamic bio-cultural matrix of TEK from a local perspective. Examples are provided from my ethnobotanical research among Joti and Piaroa Indians of the

Venezuelan Amazon, two groups which, like many other indigenous peoples of Venezuela and throughout the Amazon Basin, are undergoing rapid social and environmental change. The close connection between vernacular language and folk botanical classification among the Piaroa is discussed in the following section. A brief case study of ethnobotanical knowledge transmission and change among the Jotí group is then presented. Finally the general findings of the Jotí study are compared with the results obtained from a similar study conducted among the Piaroa, in order to highlight what may be a more general

trend of intergenerational knowledge erosion caused by contemporary cultural change and modernisation.

PIAROA GRAMMATICAL CLASSIFIERS OF BOTANICAL FORMS

LOCAL language in particular has been highlighted as crucially important for TEK preservation (Crystal 2000; Maffi 2001; Nettle and Romaine 2000) and global studies of the density and distribution of cultural diversity use language as the main proxy indicator (Harmon

2002). However, few studies actually illustrate how and why this is so, beyond pointing out the general fact that much information about the surrounding environment is encoded in language. Knowledge is structured, stored and exchanged through language at at least three primary levels: lexicon, grammar, and discourse. At each level, it is possible to identify different domains (i.e. integrated sets) of linguistic forms and meanings that are directly associated with specific cultural domains of ecological knowledge and practice (Table 1). Tracing the linkages between these domains of language, knowledge and

TABLE 1: ASSOCIATED DOMAINS OF TRADITIONAL ECOLOGICAL LANGUAGE, KNOWLEDGE & PRACTICE

Language	Knowledge	Practice
<p>Lexicon Ethnobiological nomenclature (taxa, morpho-behavioral characters, functional properties) Toponyms Biotic community names Body part names Illness terms Soil type and property terminology Weather vocabulary Food type names</p> <p>Grammar Classifiers Evidential markers Compound verb constructions Other morpho-syntactic aspects</p> <p>Discourse Mythical-historical narratives Ritual songs/chants Oratorical & dialogical performances (ceremonial & mundane) Joking Proverbs Metaphors</p>	<p>Ethnobotany Ethnozoology Ethnoentymology Ethnomycology Ethnopedology Ethnominerology Ethnogeography Ethnoecology Ethnoclimatology Ethnoastronomy Ethnoanatomy Ethnomedicine Ethnogastronomy Ethnoarchitecture</p> <p>Life form & land form classifications Ethnoepistemology Activity signatures of biotaxa Routine activity scripts</p> <p>Plant & animal natural histories Social & ecological behaviours Ecological relationships Social & spiritual values Aesthetic appreciation Experimental techniques</p>	<p>Resource procurement activities: crop cultivation pastoralism hunting trapping fishing gathering Settlement & territoriality Land use patterns Landscape modification Water management Resource localisation Activity scheduling Curing practices Tool & craft production Tool repair Food preparation & storage Housebuilding Ceremonialism Food taboos & prescriptions Sacred site observances Harvest restrictions Conservation practices Resource & practice transfer Artwork Experimentation</p>

practice in specific cultural settings offers a promising method for substantiating the connections between biodiversity and cultural diversity at the local scale.

THE most well-known and commonly-cited examples of language-bound knowledge concern the cognitive categorisation of living beings, expressed through ethnobotanical and ethnozoo-logical nomenclatures. This type corresponds to concrete object naming,

which is to say lexical-based codification. Less attention has been paid thus far to the knowledge contained at the grammatical and discursive levels even though these are more likely to be associated with more complex and abstract knowledge types, such as organising principles, explanatory models of behaviour, natural processes or interrelationships among species (cf. Kempton 2001; Maffi 2001). An illustration of the potentially close connection between

vernacular grammar and local environmental knowledge will be provided here through a brief description of the botanical applications of nominal classifiers among the Piaroa.

THE Piaroa are an indigenous society numbering about 15,000 individuals, who inhabit a large, mostly tropical forest territory in southern Venezuela. One of the terms the Piaroa use to describe themselves is *de'a ruwa* 'owner/

TABLE 2: PIAROA BOTANICAL SHAPE CLASSIFIERS

Classifier	Gloss	Classifier	Gloss
<i>isabæ</i>	length of narrow, flexible vine	<i>isæraē</i>	hanging, branching-stemmed fruit bunch
<i>isade</i>	thin, delicate stem	<i>isæsa</i>	drooping, soft-stemmed fruit bunch
<i>isah^he</i>	branching structure	<i>isæså</i>	grass growing in separate clumps
<i>isame</i>	fruit bunch on drooping skeleton-like stalk	<i>isæsu</i>	thick, curved stem of fruit bunch
<i>isamu</i>	hard, rounded, almond-like nut or seed	<i>isætæ</i>	spike-like fruit bunch
<i>isana</i>	tubular, hollow stem	<i>isæte</i>	flower type
<i>isane</i>	baby stem shoot or sprout	<i>isæt'e</i>	tuberous root
<i>isap^hæ</i>	stringy fibre	<i>isætā</i>	thin, woven-like covering or skin
<i>isap^he</i>	powdery substance on leaf	<i>isætē</i>	small fruit/seed/nut/pit
<i>isari</i>	thorn	<i>isæ^hā</i>	fruit type
<i>isate</i>	multi-part leaf bud	<i>isæ^ha</i>	fruit type
<i>isæ'æ</i>	banana-like canopied plant	<i>isæ^hi</i>	campanate-shaped flower
<i>isæba</i>	spherical fruit shape	<i>isæwa</i>	thick, gelatinous sap
<i>isæbæ</i>	thin, flat leafy cover	<i>isæwā</i>	herbaceous form?
<i>isæbi</i>	small, roundish, flattish fruit/seed	<i>isæyu</i>	oblong fruit shape
<i>isæbi</i>	single-rooted, multi-stemmed, herbaceous plant	<i>isæyu?</i>	spongy material at centre of certain trees
<i>isæč'e</i>	smaller plant form?	<i>iseč'e</i>	tight cluster of several small fruits
<i>isæč'e</i>	hair-like grass	<i>isek'e</i>	stilt roots
<i>isæča</i>	fruit type?	<i>isoha</i>	legume pod-shaped fruit
<i>isæčā</i>	dry leafless branch or fruitless stalk	<i>isohæ</i>	leaf or leafy plant

master of the forest' and in keeping with this autodenomination, they are widely regarded as being exceptionally knowledgeable and skilled at extracting a living from the forest. Before the 1960s, they dwelled in small, dispersed and shifting settlements located in interfluvial forest and avoided contact with surrounding *criollo* (i.e. white or mestizo) peoples. Their traditional subsistence economy depends on an extensive mixture of swidden horticulture,

hunting, fishing and collection activities. While the major portion of food energy is supplied by a few cultivated crops, several hundred wild plant and animal species really make vital contributions to the overall subsistence pattern as sources of supplementary foods, medicines, narcotics, tools, handicrafts, construction materials, firewood, ritual objects, indicators of ecological information and plant foods for game animals (Zent 1992).

THE Piaroa speak a language classified as one of three extant members (along with Sáliva and Maco) of the small Saliban family. One of the outstanding grammatical features of this language is the common use of more than 100 nominal classifiers that function semantically to group all nouns into a bounded number of referentially meaningful classes based on shape, size, texture, internal arrangement and number attributes, and syntactically to

Classifier	Gloss	Classifier	Gloss
<i>isædu</i>	individual, small, roundish, hard fruit/seed	<i>isðhæ</i>	fruit endocarp type
<i>isæhu</i>	single narrow vine	<i>isoho</i>	fruit type
<i>isæi</i>	big woody tree	<i>isoĩ</i>	palm class
<i>isæk'æ</i>	non-rounded stem	<i>isok'æ</i>	rosette-shaped herbaceous plant
<i>isæk'e</i>	multiple fruits or flowers in circular arrangement around stem or base	<i>isok'ẽ</i>	stick-like
<i>isæk'ẽ</i>	dehisced fruit	<i>isoka</i>	single section of multi-sectioned fruit bunch
<i>isækæ</i>	intricate, multi-part root system	<i>isokã</i>	planted or anchored stick
<i>isæke</i>	slender length of stem	<i>isokæ</i>	spiny plant
<i>isæk^ha</i>	arched, multi-sided fruit skin or shell	<i>isone</i>	small, juicy, teardrop-shaped fruit
<i>isæk^hẽ</i>	single section of sectioned stem	<i>isoñe</i>	fruit shape rounded on one end, pointy on the other end
<i>isæk^wa</i>	overgrown, bushy or tangled vegetation	<i>isop^ha</i>	small, fluttery, fern-like, leafy plant
<i>isæma</i>	medium-sized, compound flower type	<i>isoræ</i>	fruit type
<i>isæmæ</i>	flattish, whorled fruit pod	<i>isose</i>	hard empty shell
<i>isæmi</i>	tiny, round, flat (two-dimensional) fruit/seed	<i>isot'a</i>	cup-shaped fruit
<i>isæmi</i>	multi-bulbous fruit or root with common base	<i>isot'æ</i>	thick woody vine
<i>isæna</i>	round woody stem	<i>isot^ha</i>	flower shape
<i>isæra</i>	noded stem	<i>isoya</i>	thin, free-flowing sap
<i>isææ</i>	pencil-shaped fruit or flower type		

mark concordially constituents of the noun phrase outside the head (Krute 1989). The classifiers usually appear in speech as monosyllabic suffixes of the form $-(C)V$ attached to the modifier(s) within a noun phrase or to other words making anaphoric reference to some previously named head noun, but may also be expressed as abstract concepts when suffixed onto the generic root *isV*-‘thing’. The Piaroa employ at least seventy-five nominal classifier suffixes to categorise, distinguish and refer to different botanical life forms, plant parts, growth habits and ecological associations (Table 2). Different classifiers may occur with the same root, and more rarely two classifiers may co-occur, depending on which form(s) or property(ies) the speaker wants to emphasise, where the root refers to the essential plant group (folk species or genus) and the classifier(s) to the attribute(s) of it. For example, *arara-i* ‘cashew tree’, *arara-sa-de* ‘cashew sapling’, *arara-yu* ‘cashew fruit’, *arara-te* ‘cashew seed’. The set of classifiers that applies to a particular plant taxon is frequently quite idiosyncratic, so few taxa share exactly the same set with any other. The selective combining and contrasting of classifier-encoded meanings which reflect observable morphological and behavioral attributes undoubtedly contributes to the ability of the Piaroa to distinguish several hundred taxa at the basic (i.e. folk generic) level. Although undoubtedly a phenomenally complex semantic system to learn, once mastered it provides an efficient key that enables the folk botanist to quickly identify encountered individuals, to cognitively locate and incorporate unfamiliar specimens and, perhaps most importantly, to memorise a large inventory of taxa at the generic and specific ranks by assignation of clearly recognised perceptual markers.

THE contribution of shape classifier markers to the memorisation and recall of a prolific number of plant group categories is suggested by Krute’s (1989) thorough analysis of the semantic organisation of Piaroa classifiers, by my own observations of Piaroa plant naming and classification performance, and by statements of the Piaroa themselves. Krute contends that the classifiers operate as prototypical images to which referred objects are assigned on the basis of their perceived resemblance, whether literal or metaphorical, to the ideal form expressed by the classifier. Rosch (1977) has written that prototypes are important aids for the mental organisation and processing of knowledge in that items judged to be typical can be categorised more efficiently (recalled faster and longer, transmitted more accurately, sorted with fewer errors). The possible role of classifier marking for categorical memorisation also surfaced during a controlled study of individual competences of tree/liana identification, naming and utilitarian knowledge that I made in a Piaroa community in 1994. The results of that study have been reported elsewhere (Zent 1999, 2001) and some of those will be summarised below (see section on comparison with the Piaroa case, page 53), so I will not repeat them here beyond stating the general finding that a statistically significant difference between younger and older generations’ ethnobotanical knowledge was observed, with the former exhibiting lower knowledge competence levels. However, another potentially significant result of that study, not previously reported upon, was that the more knowledgeable (i.e. higher competence score) respondents tended to use more classifiers in their answers to my questions about plant names and uses. In particular, a couple of older men who scored very high on

the test made constant and consistent reference to the tree stem shape when naming the test plants through a contrasting set of classifier suffixes, *-na* ‘rounded stem’ and *-k’æ* ‘non-rounded stem’. I was initially puzzled about their insistence at making repeated reference to what seemed to me to be a rather inconsequential attribute (with the possible exception of its suitability as a housebuilding pole). So at one point during one of the interviews, I could not help but ask the respondent why he chose to name these classifiers instead of the more general classifier used to designate the tree life form, and he just smiled and said for him it was ‘easy’ to say it that way while for other people it was ‘easy’ to say it another way. After further reflection, I believe what he was trying to tell me was that his mental association and vocalisation of the plant taxon together with that particular set of classifiers simply helped him to remember it and if this interpretation is correct it suggests the mnemonic function of classifier categorisation.

JOTI ETHNOBOTANY

BEYOND tracing the vital connections among language, cognition and behaviour, an adequate understanding of the biocultural matrix of TEK requires detailed consideration of the local patterns and processes of knowledge acquisition, variation and change. A dynamic, differentiated perspective of TEK is also motivated by concerns that much valuable local knowledge is being eroded due to cultural and ecological change and that *in-situ* knowledge preservation efforts must take into account this dynamic process and the factors driving it. Partly motivated by this problematic, a comparative study of ethnobotanical variation and change was carried out in 1996–1999

among the Jotí, a traditional nomadic hunter-gatherer group who inhabit a remote, mountainous, tropical forest region of southern Venezuela. The Jotí were completely isolated from Western society until 1969 when they were contacted by missionaries. At the time of first contact, they were found living in small, fluid, nomadic bands, subsisting by hunting-gathering and incipient cultivation, and possessing a rudimentary material technology, including stone axes, and very few items of Western origin. However, two missions were established in the Jotí territory, at Caño Iguana in 1971 and on the Río Kayamá in 1983, and since then these have gradually attracted more than half of the formerly dispersed, mobile population to come and settle permanently at these fixed locations. The missionaries have taught the mission residents the Christian religion and basic non-traditional educational skills (such as literacy in the native or national languages), provided Western trade goods and medicines, and advocated agricultural innovations. Since the 1990s, some Jotí bands who chose not to move to the missions have instead migrated down the rivers to the lowland fringes of their territory and as a result have expanded their social and economic contacts with surrounding Indian and criollo peoples. The sum result is that within the space of a generation the Jotí have gone from total isolation to more or less permanent contact with outsiders with the consequence that they are now experiencing a phase of rapid culture change, including the introduction of new technology, changes in settlement pattern and economic focus, and ideological conversions. However, these impacts are uneven across the ethnic group, with mission groups being more deeply affected while independent (i.e. non-mission) groups maintain a more traditional (i.e. pre-contact) lifestyle.

TABLE 3:
SUMMARY STATISTICS OF WILD PLANT SPECIES BY USE CATEGORY

Use Category	Families	Species	Undetermined	Ethnotaxa
Edible	58	222	43	253
Magic and Medicine	67	182	76	229
Construction	59	285	46	294
Fishing	18	36	4	39
Firewood	54	325	51	351
Beverages	9	11	4	14
Hygiene	15	23	7	29
Technology	59	193	50	245
Animal Food	91	550	89	591

* Complete lists of scientific and folk taxa on which these statistics are based are detailed in Zent et al. 2001

FROM 1996–99, E. L. Zent and I carried out quantitative floristic inventories and ethnobotanical studies at four Jotí communities: Caño Mosquito, Caño Majagua, Caño Iguana and Río Kayamá. At each site, a one hectare primary forest plot was set up and all trees greater than or equal to 10 cm diameter at breast height were inventoried. The results of the floristic study indicate that the forests occupied by the Jotí exhibit surprisingly high levels of species richness. Three out of four forest plots contained greater than 180 species of large trees per hectare (Zent and Zent 2004a). These figures are remarkable for two reasons. First, they show the highest levels of tree diversity thus far recorded for the Guayana Shield region of South America. Second, all of the plots from which the figures are drawn are within a few minutes walk of a Jotí community. Thus one may conclude that the Jotí demonstrate that human occupation, exploitation and disturbance (in the form of low-impact fruit, leaf and bark harvesting, seed dispersal and gap creation) are not necessarily incompatible with high diversity maintenance

(Zent and Zent 2004b). The ethnobotanical study involved general collections, interviews and observations in regards to plot as well as non-plot plants (see below). This part of the study revealed that these people possess an extraordinarily extensive knowledge and use of primary forest species, including more than 220 edible species and approximately 180 medicinal plants (Table 3; cf. Zent et al. 2001).

BEFORE reviewing certain aspects of the current transitional state of Jotí plant knowledge acquisition, I would like to consider briefly how such knowledge is organised in terms of the morpho-behavioral characters and cues used to distinguish among the wide variety of plants found in local environments. The expert Jotí botanist can usually identify most trees from a distance of 10 m to 20 m or more away, from its overall appearance, especially the stem form. If not, he or she will take a closer look at the trunk or bark, perhaps cut it with a knife and smell it or see what kind of resin or sap flows out. If it still cannot be identified, he or she will look up at the

TABLE 4: JOTI PLANT CLASSIFICATION CHARACTERS & TERMINOLOGY

Plant part	Characters							
	habit form	circum-shape	abundance	height-length	girth	buttress	habitat	location
Stem	<i>jjëi</i> : tree <i>ji</i> : palm <i>ibuju</i> : liana <i>jena</i> : hollow-stemmed <i>jele</i> : small woody plant <i>ja</i> : herbaceous leafy plant <i>jawajwa</i> : herb with leafy canopy on top <i>jtejte</i> : grass	<i>libude</i> : round <i>ñë</i> : non-round <i>wilo</i> : twisted	<i>jkyë</i> - (<i>jae</i>): singleton <i>jkwëda</i> : numerous individuals <i>x jkyo</i> : x-dominant stand	<i>jtamina</i> : tall or long <i>alikhwëde</i> : short <i>jtamiwëña</i> : branches high above ground	<i>uli</i> : large <i>jani</i> : small <i>jjona uli</i> : largish <i>jjona jani</i> : smallish <i>ulii</i> : very large	<i>jlajla</i> : vertical <i>jlajlade</i> : without <i>jlëya</i> : lateral ground roots	<i>bëkya</i> : anywhere <i>inëwani</i> : rock outcrop <i>jkyoni</i> : high forest <i>me</i> : savanna <i>jkyo jwi</i> : forest hill <i>inëwa jwi</i> : rocky hill <i>jedö ani</i> : riverbank <i>jani jedöni</i> : creekbank <i>jedö jtuni</i> : headwater spring <i>jnemeki (jaeni)</i> : forested plain <i>balojkwa</i> : swidden plot <i>jkyo mabau</i> : lagoon or flooded forest <i>me oneka</i> : forest-savanna ecotone <i>jtujtiko</i> : scrub forest	<i>jtödö</i> : far <i>jamena</i> : near <i>jkyaka</i> : downriver <i>mameka</i> : upriver
	layer	thickness	colour	texture	hardness	taste-smell		
Bark	<i>mi (ji)</i> : inner bark <i>mi jkyoka</i> : outer bark	<i>bajtu</i> : thick <i>nane</i> : thin	<i>jwalëjite</i> : black <i>duwëjka</i> : brown <i>nujtibo</i> : green <i>kyabo</i> : white <i>duwëwe</i> : red	<i>jtejtëna</i> : smooth <i>jaeka</i> : ridged <i>jolowaka</i> : rough <i>nenowa</i> : slick & non-fibrous <i>ba</i> : thorny <i>iyeba</i> : flaking	<i>juluwëka</i> : tough <i>baliyeka</i> : brittle <i>ikyeka</i> : hard <i>jkolaibe</i> : fibrous	<i>jlebona</i> : fragrant odour <i>jlebonade</i> : odourless <i>yaka jlebona</i> : pungent <i>iniwëjka</i> : onionlike <i>jtilo</i> : mildly pleasant <i>jtijtikë</i> : very bitter <i>lowekado</i> : nauseous <i>nujtiyëbo jibu</i> : chlorophyllous		
	presence	abundance	colour	texture	taste-smell			
Exudates	<i>nana</i> : generic term for exudate <i>nanade</i> : no exudate	<i>aewa</i> : a lot <i>ejlau</i> : flowing <i>janiwana</i> : a little	<i>duwëwe</i> : red/yellow <i>kyabo</i> : white <i>jwalëjite</i> : black <i>aoubounajae</i> : transparent	<i>jjubomajae</i> : milk-like <i>jtijkëwaka</i> : sticky <i>ojtewaka</i> : oily <i>ikyekabae</i> : hardens	<i>jtilo</i> : mildly pleasant <i>yaka</i> : mildly bitter <i>jkujtiwaka</i> : malodorous <i>jjwaka</i> : rotten smelling			

leaves, then perhaps the fruit or flowers. In other words, the procedure for keying out a plant goes from perceptually larger to smaller properties, from more to less accessible percepts, from ground-level to aerial strata. However, in fact numerous characteristics of the different parts of a plant are taken into account simultaneously in order to ‘classify’ it, such as pattern, shape, abundance, size, habitat, location or niche, colour, texture, hardness, taste or smell, interspecific associa-

tions, and the human uses or actions applied to it. Each part has its own specific set of features (Table 4). Many of these features are formally labelled and it is not uncommon to hear such labels being attached verbally to different plant types when people are out in the forest and talking about what they see or reporting their discoveries to someone back at home. However, it is also clear that plant classification does not depend entirely upon abstract character categorisation

encoded in a formal vocabulary. Many species are recognised and classified by reference to other known species, often expressed in the form ‘species *x* has fruit the same size and shape as species *y*’ or ‘the exudate of species *y* smells like that of species *z*.’ Thus the ability to learn and remember a large number of taxa depends on prior associative knowledge of a number of other taxa and we can infer that learning large inventories is not merely an additive process but also

Plant part	Characters							
			colour	hardness	taste-smell			
Wood <i>jtawī jyēi</i> : generic term for wood			<i>kyabo</i> : white <i>duwēwe</i> : red <i>jwalējte</i> : black	<i>waño</i> : soft <i>ikyeka</i> : hard	<i>yuwējka</i> : noxious			
	abundance	size	girth-width	texture	venation	substance		
Leaf <i>jya</i> : leaf <i>aiyē</i> : leaves	<i>aewa</i> : a lot <i>janiwana</i> : a little	<i>jtami(wa)</i> : long <i>yowa(ki)</i> : long & thin <i>alikhwēde</i> : short <i>anī jkuwējte</i> : pointed	<i>uliwa</i> : large <i>janiwa</i> : small <i>bajtu</i> : thick <i>nijluka</i> : broad <i>ijluki</i> : slender <i>janiijawa</i> : very small <i>janajnae</i> : thin & fragile	<i>jtejtēna</i> : smooth <i>jtīwa</i> : glossy <i>iyebe</i> : flaky <i>jkuwējte</i> : sharp <i>jwi yuku</i> : abrasive <i>kō</i> : tomentose <i>najni</i> : smooth <i>nilujkado</i> : powdery	<i>jwi jele</i> : midvein <i>jlēya</i> : primary veins <i>jtinēki</i> : secondary vein	<i>ikyeka</i> : hard <i>jkēnowano</i> : soft <i>juluwēka</i> : tough <i>baliyeka</i> : brittle		
	pattern	abundance	size	shape	colour	texture	taste-smell	seasonality
Fruit	<i>ju/ujtō</i> : spherical <i>adē jukwa</i> : round with seeds inside <i>jtidoju</i> : oblong <i>dalē/adē</i> : small fruit <i>ja/iēya</i> : legume	<i>aewa</i> : a lot <i>janiwa</i> : a little	<i>jani(wa)</i> : small <i>uli</i> : large <i>yowaki</i> : small <i>jtūweneka</i> : long <i>alikhwēde</i> : short	<i>jkōjkōni</i> : rosette <i>dujwe</i> : flat <i>jēle ajkuni</i> : grows on stem <i>jeme</i> : multi-stemmed fruit bunch	<i>duwēwe</i> : red-yellow <i>duwējka</i> : orange <i>kyabo</i> : white <i>nujtibo</i> : green-blue <i>jwalējte</i> : black <i>kao</i> : turns dark purple	<i>inēkade</i> : dry & inedible <i>ejlau(jkwa)</i> : juicy <i>jolowaka miji</i> : rough skin <i>jtejtēna miji</i> : smooth skin <i>neg</i> : humid <i>janajna</i> : dry meat	<i>inēka</i> : delicious <i>jtijtikē</i> : bitter <i>jtijtīde</i> : not bitter <i>ejkaka</i> : spicy <i>yuwējka</i> : noxious <i>lowekado</i> : nauseous <i>jlebona</i> : pleasant <i>wikē</i> : sour	<i>jtūwōni</i> : dry season <i>ojkunē</i> : wet season (various finer distinctions made for each type)
	abundance	size	pattern	colour	texture	seasonality	behaviour	
Flower <i>bu</i> : generic term for flower	<i>aewa</i> : a lot <i>janiwana</i> : a little	<i>jani</i> : small <i>jani</i> : very small <i>uli</i> : large <i>alikhwēde</i> : short <i>jtamiwa</i> : long	<i>jkōjkōni</i> : rosette <i>jkwiini</i> : compound	<i>kyabo</i> : white <i>duwēwe</i> : red-yellow <i>duwēno</i> : intensely red <i>kyajka</i> : maroon-purple <i>nujtibo</i> : green-blue	<i>jēna</i> : nectar	<i>jtūwōni</i> : dry season <i>ojkunē</i> : wet season (various finer distinctions made for each type)	<i>jkukē(deke)</i> : falls to ground	

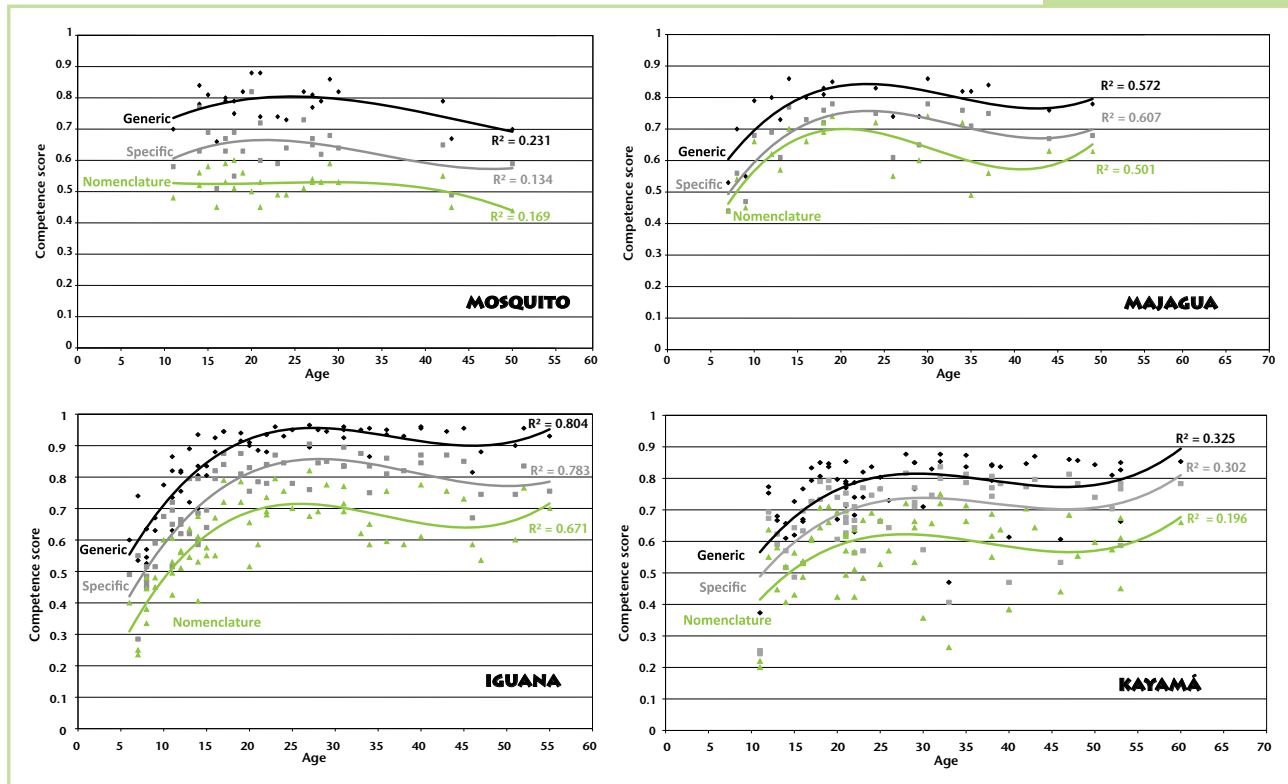
a ramifying and contextual one, with future learning potential being a function of prior learning achievements.

VARIATION & CHANGE IN KNOWLEDGE ACQUISITION

IN order to study the dynamic processes of ethnobotanical knowledge acquisition and distribution, we compared

interinformant knowledge patterns across the four study communities. Mosquito and Majagua are smaller, independent, less acculturated settlements while Iguana and Kayamá are the larger, mission-based, more acculturated communities. Another key variable for our sample design was whether they occupied traditional premontane forest habitats (Mosquito and Iguana) or non-traditional fluvial forest and savanna

forest transitional habitats (Majagua and Kayamá). Thus each community was distinct in terms of the cross-cutting parameters of settlement and habitat as follows: Mosquito (traditional settlement, traditional habitat), Majagua (traditional settlement, non-traditional habitat), Iguana (non-traditional settlement, traditional habitat) and Kayamá (non-traditional settlement, non-traditional habitat).



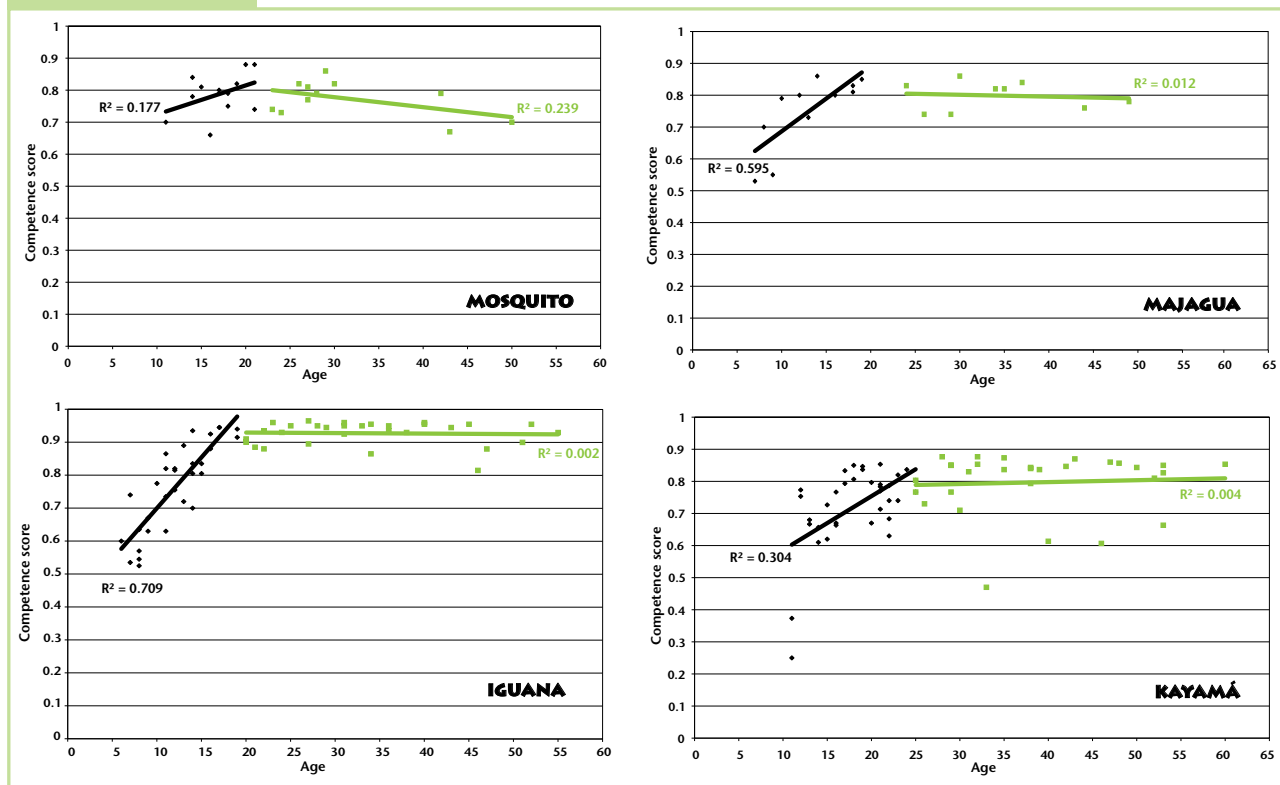
THE research method consisted of carrying out structured interviews in reference to the plot trees and lianas among a broad range of community members varying by age and sex. The respective sample sizes were: 24 individuals (15 males, 9 females) at Mosquito, 20 individuals (12 males, 8 females) at Majagua, 62 individuals (31 males, 31 females) at Iguana, and 63 individuals (32 males, 31 females) at Kayamá. Each person interviewed was walked through the plot and asked to provide the name, taxonomic classification and use values for every marked plant in the plot. Individual knowledge was measured by performing a cultural consensus analysis on the totality of answers using the Anthropac computer program (Romney et al. 1986).² Linear and curvilinear regression was used to model and test the relationships between ethnobotanical competence and age. Given the difficulties of directly observing knowledge acquisition and

change over time, we used age as a proxy for modelling time-based learning, an inferential technique that is commonly used in developmental bio-psychological research (cf. Chipeniuk 1995; Hatano and Inagaki 1999; Kellert 1985; Ki-fong Au and Romo 1999). We then compared the statistically modeled learning curves across the four communities and the relationships of these to change-indicator variables in order to infer the impact of social and ecological changes on the knowledge acquisition process. This last step is especially important because it provides the context needed to interpret correctly the observed knowledge-upon-age differentials by community, as representing either a normal learning trend (i.e. age-based knowledge accumulation) as may be expected under steady-state conditions or rather as a delearning trend (i.e. failure to learn what elders once learned) as may be expected under rapid change conditions.

DUE to space constraints, in this paper I am only able to present a very brief and laconic summary of the results that are most relevant to the main topic of knowledge transmission and change (see Zent and Zent 2004 for a more detailed discussion). The first set of results reviewed here are scatterplots and polynomial regression trendlines for generic, specific and nomenclatural classification (indicated in black, grey and green respectively) by age in the four communities (Figure 1). 'Generic' classification refers to middle-inclusive groupings, 'specific' to lower level terminal taxa, and 'nomenclature' to the particular names given to a plant. Please keep in mind that the two plots on top correspond to the two non-mission groups and the bottom two refer to the two mission communities, while the two plots on the left correspond to settlements located in the traditional habitat setting and the two on the right indicate recently-colonised, hence

FIGURE 2

Generic classification by age



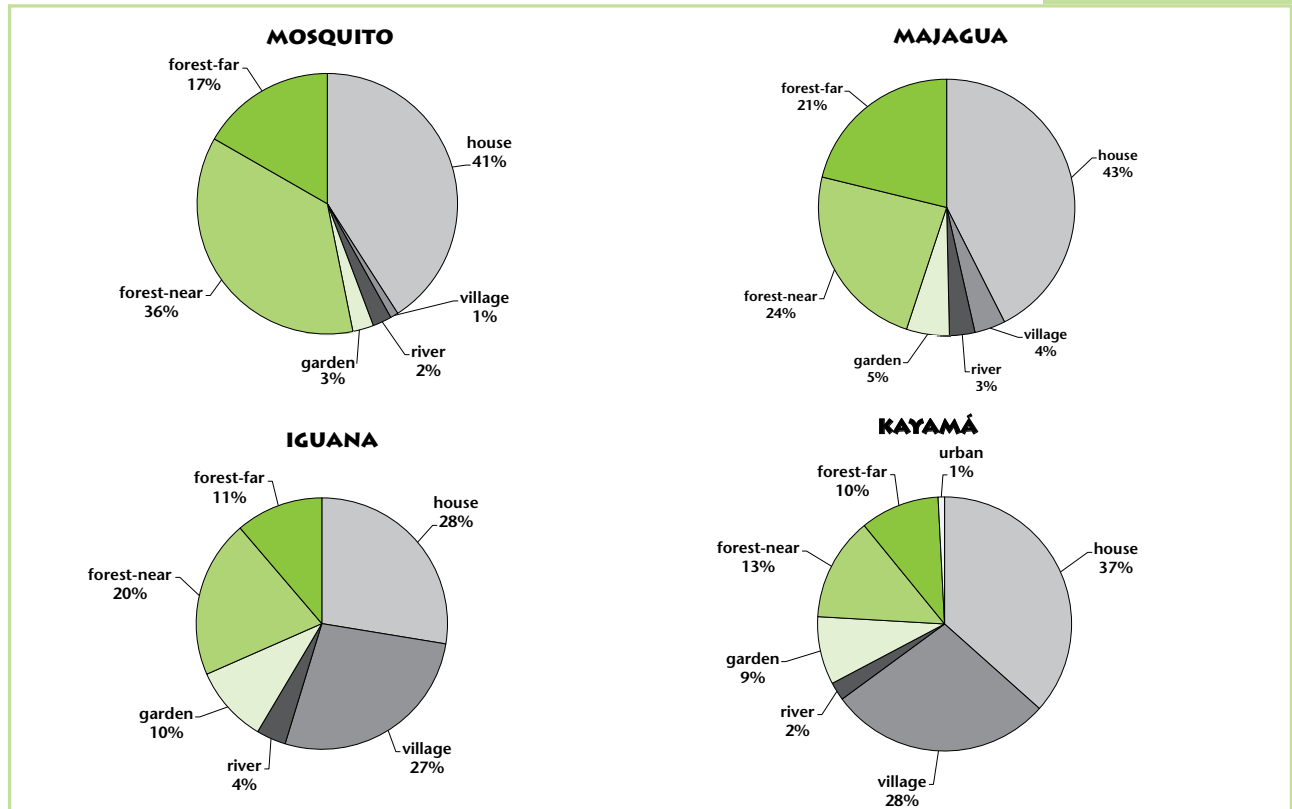
non-traditional ecozones. In all groups, the consensus knowledge trends at the three levels of classification are closely parallel, thus indicating that acquiring correct names is closely associated with correct taxonomic identification, and lower-level taxonomic classification is closely associated with higher-level classification. Regarding knowledge-on-age trends, Majagua, Iguana and Kayamá share the same basic pattern, that is a definite rise of competence by age among younger people up until around 20 years of age followed by no further significant acquisition after that, no matter how much older one is. The pattern observed at Mosquito is different, there being no significant change of knowledge level between younger and older persons.

THE marked difference between an active (de)learning phase among younger people vs. a more static non-learning

phase among adults greater than 20 years of age can be made more visible by dividing our community samples into younger and older groups and then plotting the results. Figure 2 displays the dichotomised competence-on-age trends for generic classification. The results show very clearly the active (de)learning trend among children, adolescents and young adults at Majagua, Iguana and Kayamá whereas there is no significant difference among younger and older people at Mosquito.

THE next graph hints at the reasons for the uniqueness of Mosquito (Figure 3). Through time-allocation studies,³ we were able to determine that they spend a greater amount of their time out in the forest, marked by the dark green colours in the figure. In fact, going from upper left to upper right and then lower left to lower right, that is from least to most acculturated, we see a progressive

drop in the amount of time spent in the forest. Related to this, the people at Mosquito and Majagua are still more dependent on wild resources for their subsistence, and children likewise have more contact and manipulation of forest plants. Younger people at Majagua, we remember, also displayed less knowledge by age than adults, indicating a delayed learning phase, similar to mission communities, but this result can probably be explained by the fact they have recently moved into a non-traditional habitat, hence historically less familiar flora. Thus when viewed in a cross-community context and related to indicator variables of activity or habitat change, the results suggest that adolescents and young adults in the mission communities and the independent, migrating community are experiencing a delearning trend (i.e. failure to learn knowledge that is normally acquired by such individuals under traditional conditions).



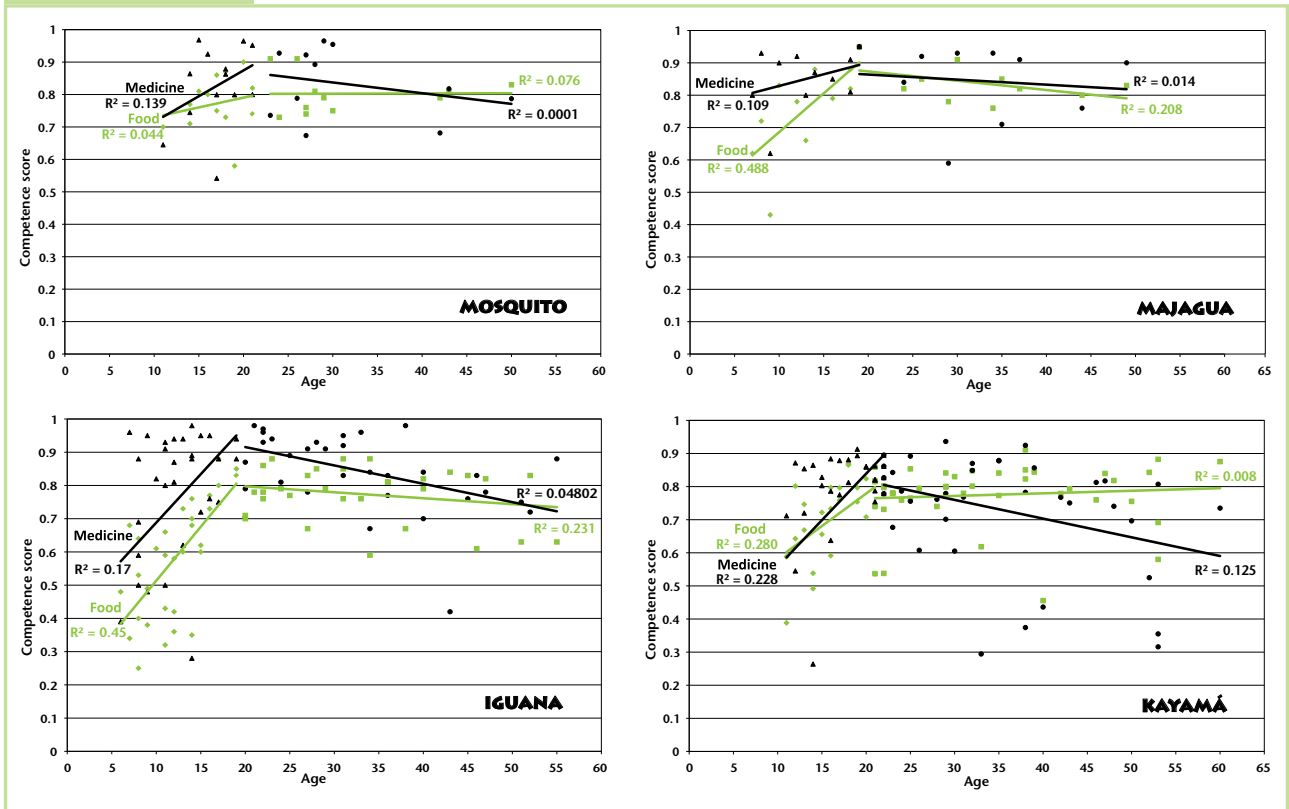
THE learning process of use knowledge – food and medicine classification – is modelled in the next set of dichotomised sample plots (Figure 4). The respective dichotomised trends across communities described above are replicated once again for food use categorisation: competence rises with age until young people reach their early twenties in Majagua, Iguana and Kayamá while there is no significant difference by age at Mosquito. For medicinal use, however, the pattern is somewhat distinct. Younger people at both Mosquito and Majagua, the two independent communities (top two plots), display insignificant differences of competence from older people. Meanwhile at the two mission communities there seems to be a weakly significant bimodal tendency for the younger cohort to improve their competency with age and for the older cohort to decline in competency with

age. This unlikely result is seemingly caused by the fact that the younger people are picking up knowledge about more commonplace and widely-known plant cures while older adults know more rare medicinals. If this assumption is correct, it would also mean that the consensus model is not the most appropriate method for analysing the distributional pattern of this data set (because knowledge of rarely used medicinal plants qualifies as a type of specialist knowledge, see note 1). As can be appreciated in Figure 5, older people at Iguana and Kayamá display larger inventories of medicinal plants (a measure different from cultural consensus) than younger people, as the bottom two trends are clearly significant. Our cross-community interpretation of this result takes into account the fact that Western medicines are readily available at the missions whereas at the independent

communities they are not. Apparently mission-raised children are not learning as many medicinal plants as their non-mission counterparts. There are other key results that should be briefly mentioned: (a) no significant differences in taxonomic or use value knowledge levels were found according to gender or according to gender by age; (b) there is a rather strong positive relationship between ability to classify at the specific rank and food use knowledge among all communities except for Mosquito, and a similar but weaker relationship of this kind with regard to medicinal use knowledge, thus indicating that taxonomic and utilitarian knowledge are to some extent interdependent; and (c) degree of bilingualism and length of school education were not found to correlate with ethnobotanical knowledge at Kayamá, the only community where these developments have occurred.

FIGURE 4

Food & medicine classification by age



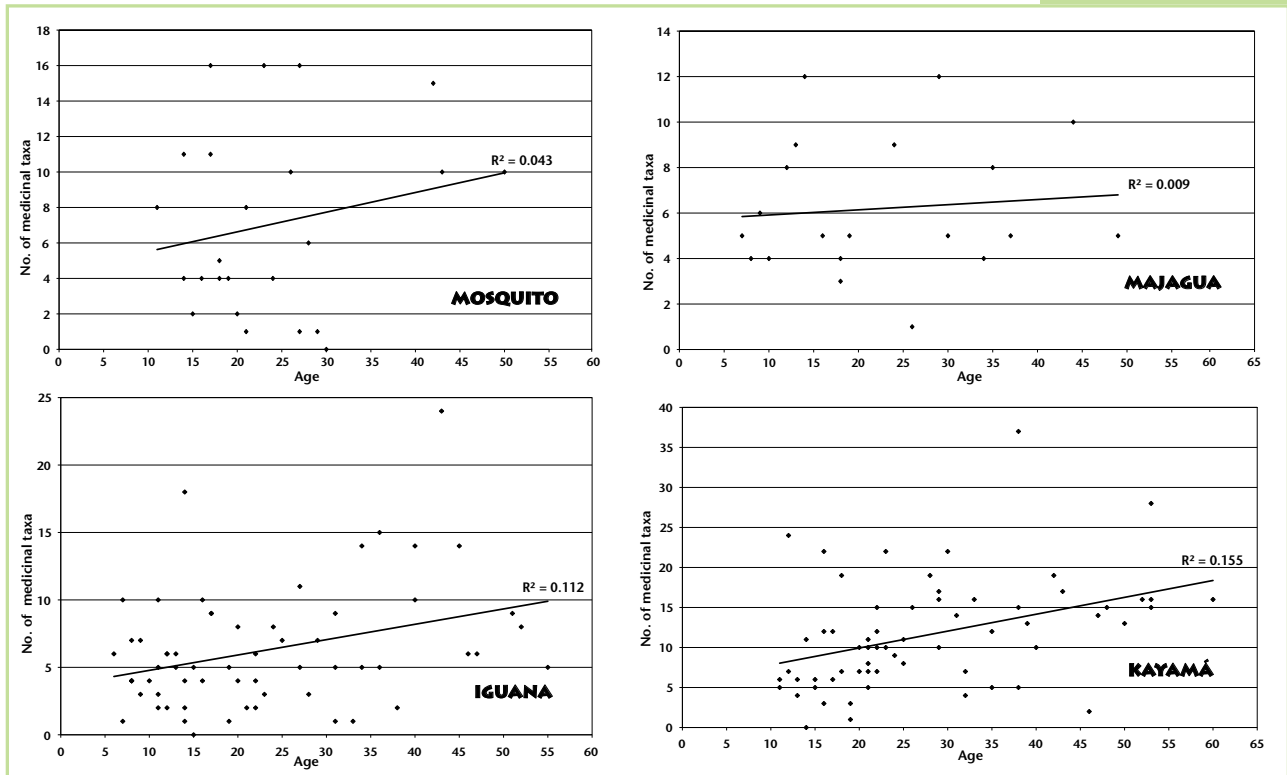
DYNAMIC CONTEXT OF KNOWLEDGE TRANSMISSION

THE previous section examined the socially and ecologically structured pattern of ethnobotanical knowledge variation within and between Jotí communities as an indirect means of inferring processes of knowledge acquisition and its change over time. Now we turn to a brief but more direct consideration of the actual knowledge acquisition/transmission process, the routine procedures and contexts through which this occurs, and the social and ecological transitions affecting these. Although research on the informal acquisition of biological knowledge has expanded in recent years, most of this has focused on the psychological rather than the cultural or sociological dimension. Thus I limit my discussion to the socialisation process by which a child or novice, through recurrent and

situated interactions, communications, observations and participation in shared experiences with older and/or more experienced individuals, acquires the knowledge and skills that are needed to function, and be regarded, as competent members of their communities.

PREVIOUS anthropological and educational studies have emphasised the informal, context-dependent, activity-situated and participatory nature of traditional knowledge transmission, and our observations of Jotí ethnobotanical knowledge are largely consistent with this characterisation (Katz 1986, 1989; Lave and Wenger 1981; Lozada et al. 2006; Zarger 2002). According to our experience of Jotí daily life, most talk about plants occurs in contexts in which there is direct contact and interaction with them. These include: walking through the forest, harvesting plant products,

processing or eating the catch, painting the body with vegetable dyes, performing rites with magical plants to enhance hunting success, curing the sick, etc. We did not witness formal or consciously-planned teacher-led instruction about plants, with the exception of one of the schoolteachers at Kayamá who decided to teach his pupils about plants after we completed our study and then informed the community of the gap between children's and adult's knowledge on the subject. Only when children asked questions first to parents, older siblings or other caregivers, usually in the course of subsistence activities, was specific and directed verbal instruction provided. In that sense, we would characterise ethnobotanical knowledge transmission among Jotí as learner-initiated or motivated: information is verbally transmitted from expert to apprentice upon the latter's request. More commonly,



however, the child-learner will merely watch and listen to what adults or older children do or say in the course of their normal activities. Thus it appears that the primary method of knowledge acquisition in this context is focused observation and peripheral participation, a pattern reported elsewhere (Katz 1986; Zarger 2002), and the burden of transmission is with the learner. This style of learning is also consistent with the general norm that individuals are able to choose what activities they engage in free from social pressure or coercion of any kind from a young age.

WE asked a number of individuals who it was that taught them about plants in general and particular, and how was this done. The most common response was one's parents, or occasionally a grandparent (no one indicated a sibling), but almost everyone was unable to answer how it occurred

and seemed puzzled at the suggestion. This suggests the largely unconscious nature of this process. We also asked several adults if they taught their plant knowledge to their children. Most assured us that they did but were unable to specify how they did so other than to say they took them along camping or hunting-gathering. In sum, we can characterise the ethnobotanical knowledge transmission process as mostly unconscious, activity-situated, verbally and non-verbally communicated, observer-activated and learner-directed.

WHAT are some of the impacts of social and economic change on ethnobotanical knowledge transmission/socialisation? Mission groups differed socially, behaviorally and culturally from non-mission groups in the following ways:

1 Less time is spent with adults, more time is spent with peers. Due to habitat

modification in a relatively larger area surrounding the village, children's unchaperoned range has increased. Less free time is also available to adults such that when they are at home or in the village, where children could potentially spend more time with them, they are often very busy with other work or visiting other adults;

2 Less time is spent in traditional subsistence activities and more time is spent in non-traditional activities such as church, school or organised games;

3 Less importance is attached to a large variety of supplemental wild resources due to more dependence on agriculture, including non-traditional crops introduced by missionaries, and imported foods, tools and materials.

4 There is less concern for learning about medicinal plants because free

antibiotics, analgesics and other pharmaceuticals are available at the mission;

5 Greater social and economic value is being attached to allotochthonous knowledge, especially among young people, such as school education, Spanish language, Christian religion, specialised skills (e.g. Western medical caregiving, carpentry, electricity, masonry, lawn-mowing), and the ability to play football or other sports. This is because these are perceived as training paths to acquiring higher social status and material benefits (for example, people who perform such services are rewarded by the missionaries). Some children expressed their desire to follow novel career paths (airplane pilot, agronomist, medical doctor).

ONE of the main results of the changes in patterns of social interaction, activities and values is the generation gap in ethnobotanical knowledge observed previously. This indicates that TEK is especially sensitive and vulnerable to changes in the surrounding context.

COMPARISON WITH THE PIAROA CASE

AS mentioned previously, cross-cultural comparisons are useful for revealing more general or explanatory trends in knowledge transmission and its change beyond the confined setting of a local group. With this goal in mind, I now compare some of the results obtained in the Joti study with those obtained in another similar but smaller study I made among the Piaroa group that was mentioned earlier (see Zent 1999, 2001 for a detailed description and analysis of

the methods and results). The Piaroa are also an indigenous horticultural-hunting society and inhabit a tropical forest habitat similar to that of the Joti, but their history of contact and integration with Western society is about a generation longer. The study was conducted in Gavilán, a relatively large, nucleated and sedentary town that was founded thirty years prior to the date of the study and is about an hour's car drive away from the state capital city. While people in this community still generate a large portion of their own daily subsistence, mainly through shifting cultivation, at the same time they have become highly dependent on outside markets and a money economy and government-provided services (school, health care, housing, electricity, cooperative businesses). A large proportion (about 50 per cent) speak the national language, and the preponderance of Western cultural ideals, practices and material items is plainly evident.

THE main result from the Gavilán study that I want to mention here is that the same general pattern of knowledge differential among younger vs. older generations for taxonomic and use competence was found but in this case the rise of knowledge with age is even more extended, up to 30 years old and perhaps slightly beyond. Averaging the recorded competence scores by age cohort, it was found that 10 to 14 year-old males are able to identify and name correctly 46 per cent, 15-19 year olds 53 per cent, 20-24 year-olds 69 per cent and 25-29 year olds 76 per cent of the trees or lianas that mature adult males of 30 years old and above typically know. These figures suggest that the knowledge generation gap has become wider in comparison to the Joti case. My interpretation is that this differential really reflects a trend of knowledge decline among the younger generation of Gavilán residents that will

never be fully made up, rather than a so-called 'normal' learning curve. This is based partly on the historical datum that the town was also founded thirty years prior to the study. From that point on, the ecological, economic, social and cultural life of the people began to change radically. Children growing up in this environment were exposed directly or indirectly through their care-givers to classrooms, Western medicines, imported foods, exotic goods, frequent visits to the capital city, organised sports, radios, television, Christian religion, retreating forest edges, political parties and a host of other non-traditional agents of change. Another telling result of the study contributing to this interpretation is that intrusive knowledge forms, as indicated by years of school education completed and bilingual ability, were found to be contributing factors to lower competence levels. Finally, Gavilán youngsters also appear to be somewhat knowledge-deprived when the results are considered in the light of cross-cultural comparison. In other studies of ethnobotanical knowledge acquisition carried out among rural, agrarian populations in Meso-America, it was found that adult or near-adult competency is reached by about the age of puberty (12 or 13 years old) (Hunn 2002; Stross 1973; Zarger and Stepp 2004). Taken together, these data strongly suggest that the observed knowledge differences by age in Gavilán expose a delearning trend that contributes to a TEK generation gap. The fact that this gap is wider among the Piaroa than among the Joti and that the former exhibit a more advanced state of general cultural and ecological change suggests that this may be a more general, interculturally-valid process resulting from progressive impairment, devaluation or disuse of traditional transmission processes. Further confirmation of this hypothesis could be provided by

measuring and comparing the relative generation gaps among groups who have travelled even further down the road of cultural modernisation.

CONCLUSION

WHEN viewed at a national scale, it seems all too obvious that many if not all indigenous peoples in Venezuela are currently experiencing a widespread trend of TEK erosion associated with rapid cultural and ecological change (cf. Zent and Zent 2007). However, I have attempted to show here how a closer look at the unfolding of this general trend in specific localities can enrich our understanding of the variation and complexity of this process. The particulars of biocultural connections, acquisition dynamics and contingent variables of change among the Jotí and the Piaroa allow us to distinguish (partially) separate realities of the TEK transition within the larger picture. The careful comparison of differences as well as similarities across different groups permit sharper definition of the general processes and causal factors involved. Thus local language was highlighted as an integral component of TEK management among both groups. Although there is no indication that either the Jotí or Piaroa languages are facing imminent endangerment and in none of these groups are vernacular mother tongue speakers declining, a closer look at their situations suggests that the local language may be undergoing significant shifts. Villalón (n.d.) characterises Jotí as a generally stable but threatened language given the small population and rapid transculturation they are experiencing, and classifies Piaroa as hypothetically threatened due to the rapid increase of bilingualism among young people. The evidence

reviewed here suggests however that traditional environmental language, classifier suffix designations among the Piaroa and plant names and plant part attributions among the Jotí, may already be experiencing decay in the sense of structural (categorical) and functional (use) reduction, with serious consequences for continued maintenance of ethnobotanical knowledge and use abilities. This observation elicits the hypothesis that traditional environmental language is one of the linguistic domains that first suffers decay in a context of rapid cultural and ecological change.

CLEAR trends of TEK erosion were detected in the two case studies described and the displacement of traditional methods, actors and contexts of knowledge transmission was emphasised as a main contributing factor. Comparing the two cases brought to light that the erosional process is manifested locally as an ever-widening generation gap, which further underscores the importance of better understanding how and why transmission of knowledge from older to younger generations is or is not occurring. The data reviewed here suggest that the Piaroa have moved further along this intergenerational transition and therefore more drastic measures aimed at revitalising, reinventing or revaluing threatened mechanisms of knowledge transmission may be needed.

WHAT are the implications of TEK delearning trends for maintenance of cultural and biological diversity? The case studies reviewed in this chapter and elsewhere (Begossi et al. 2002; Benz et al. 2000; Caniago and Siebert 1998; Case et al. 2005; Estomba et al. 2006; Luoga et al. 2000; Voeks and Leony 2004) support the hypothesis that local acculturation processes driven by exogenous agents and forces of change negatively impact

the retention of rich ethnobotanical inventories from one generation to the next. Meanwhile the positive feedback (i.e. deviation-amplifying) effects of declining knowledge on processes of cultural and ecological change are less well understood at this time but may be equally significant. For example, it seems logical to assume that the loss of knowledge about edible and medicinal plants makes people increasingly dependent upon cultivated or imported foods and medical care provided by outsiders, thus reinforcing pressures toward settlement nucleation and sedentism, agricultural intensification, market integration, national language learning and sustained contact with surrounding societies. As well, diminishing knowledge and use of wild plant resources appear to be linked to corresponding shifts in the ecological impact of subsistence and settlement patterns on local biodiversity. Among the Jotí, knowledge of the seasonal habits and dispersed locations of a diverse range of plant and animal species plays a key role in traditional trekking (i.e. mobile camping) and foraging behaviors. These activities are in turn associated with micro-scale, low-impact ecological disturbances (e.g. seed banking and dispersal, felling of senescent trees, gap creation, cultivation in tree fall clearings and selective fire application) that maintain and create biodiversity within the surrounding landscape (Zent and Zent 2004b). With the decline of nomadic foraging habits, one may also expect fewer diversity-enhancing disturbances caused by humans. Among the Piaroa, the traditional long-fallow shifting cultivation cycle coupled with frequent settlement mobility produces a heterogeneous mosaic of secondary vegetation in various stages of succession interspersed with primary forest types. Different inventories of utilised plant and animal species are associated with each vegetation type,

thus providing incentives for their continued maintenance and reproduction (Zent 1995, 1997). The commercialisation and intensification of slash-and-burn cultivation practices, resulting in the lengthening of the cultivation phase and the shortening of the fallow phase, along with greater population pressure on local resources due to greater concentration and sedentarisation of settlement, has produced habitat and biodiversity degradation in the home ranges of some Piaroa communities (Melnick 1993; Zent 1994, 1999). Thus the dynamic interrelationships between traditional knowledge, socioeconomic practice, ecological impact and biodiversity are clearly inferable from a close consideration of these case studies.

WHETHER the changing knowledge base can be implicated as a contributing cause, rather than merely an effect, of larger social and environmental trends still needs to be answered and will require a more focused research design, preferably implemented at different sites. If future research does determine that changing patterns of TEK interact in a causal or synergetic sense with other change indicator variables, then this would give some support to the hypothesis that biological diversity and cultural diversity are interdependent (rather than analogous) phenomena. It would also reinforce the idea that TEK erosion is not necessarily an inevitable outcome of modernisation processes and therefore underline the importance of promoting the intergenerational transmission of TEK as a means for defending biocultural diversity over time. In conclusion, we recommend that more local-level studies of the causal or systemic linkages between TEK and the broader historical and ecological context are needed to advance both the theory and the policy applications of biocultural diversity.

ACKNOWLEDGEMENTS

PREVIOUS versions of this chapter were presented at the UNESCO/Japan Center for Area Studies, National Museum of Ethnology Symposium and Experts Meeting 'Safeguarding the Transmission of Local & Indigenous Knowledge of Nature: Exploring Linkages between Cultural Diversity and Biodiversity' held at Aichi Prefectural University, Nagoya, Japan, April 14–15, 2005, and at the Christensen Fund/Terralingua-sponsored Workshop 'Gaps and Needs in Biocultural Diversity Research' held at the University of Florida, Gainesville, Florida, United States of America April 21–22, 2005. The author wishes to thank the participants of those events for stimulating feedback that helped me to sharpen some of the ideas presented in the written version. Useful comments and criticisms of an earlier draft were provided by Egleé Zent, Janet Chernela, Jenny Navas, Jeyni Gonzalez, Francisco Tiapa, Yheicar Bernal, Marie Claude Mattéi-Müller, Peter Bates and Sabine Kube. Any errors of fact or interpretation are the sole responsibility of the author. The data on the Jotí was collected and analysed together with Egleé Zent. Material support for the Piaroa fieldwork was given by the Instituto Venezolano de Investigaciones Científicas (IVIC), International Institute of Education Fulbright Fellowship Program and the Explorer's Club. Material support for the Jotí fieldwork was provided by the IVIC, the Consejo Nacional para la Investigación Científica y Tecnológica (CONICIT), and the Wenner-Gren Foundation for Anthropological Research.

NOTES

1 Cultural consensus analysis, as developed by Romney and associates (1986, 1987), is a mathematical technique based on principal components analysis, which is designed to measure patterns of interinformant agreement/disagreement about selected culturally shared domains. The method requires obtaining a single factor solution (expressed by a first eigenvalue three times greater than the second eigenvalue), which indicates that a group consensus model exists. Having established that consensus configures the domain, it permits: (a) determination of the correct (i.e. consensual) answers (when such answers are unknown beforehand) and (b) rating of the individual knowledge levels, expressed in terms of competence scores. The method is limited in the sense that it is appropriate for rating generalist knowledge but not appropriate for specialist knowledge. It has been widely used in studies of TEK variation and change (Atran et al. 2002; Guest 2002; Miller et al. 2004; Reyes-García et al. 2005, 2007; Ross 2002; Ross and Medin 2005; Zent 1999, 2001; Zent and Zent 2004).

2 To measure time allocation, the spot check method innovated by Johnson (1975) was used. The method involves random selection of individuals and hourly time periods and the instantaneous observation and recording of the person's activity and location at the designated hour. The sum total of observations per activity type is converted to a time allocation figure (i.e. minutes per day) by multiplying the relative frequency of the activity by the number of hours (thirteen) covered by the daily observation period (0600hr to 1900hr). The overall result is a quantitative profile of the time spent per activity by the community.

REFERENCES

- Alexiades, M.N.** 2007. *Mobility and Migration in Indigenous Amazonia: Contemporary Ethnoecological Perspectives*. Oxford, Berghahn Books.
- Atran, S., Medin, D., Ross, N., Lynch, E., Vapnarsky, V., Ucan Ek, E., Coley, J., Timura, C. and Baran, M.** 2002. Folkecology, cultural epidemiology, and the spirit of the commons. *Current Anthropology*, 43:421–450.
- Begossi, A., Hanazaki, N. and Tamashiro, J.** 2002. Medicinal plants in the Atlantic Forest (Brazil): Knowledge, use, and conservation. *Human Ecology*, 30(3):281–299.
- Benz, B.F., Cevallos, J., Santana, F., Rosales, J. and Graf, S.** 2000. Losing knowledge about plant use in the Sierra de Manantlan Biosphere Reserve, Mexico. *Economic Botany*, 54:183–191.
- Brodt, S.** 2001. A Systems Perspective on the Conservation and Erosion of Indigenous Agricultural Knowledge in Central India. *Human Ecology*, 29(1):99–120.
- Caniago, I. and Siebert, S.F.** 1998. Medicinal plant economy, knowledge and conservation in Kalimantan, Indonesia. *Economic Botany*, 52:229–250.
- Carlson, T. and Maffi L. (eds.)** 2004. Ethnobotany and Conservation of Biocultural Diversity. *Advances in Economic Botany*, Vol. 15. Bronx, New York Botanical Garden Press.
- Case, R.J., Pauli, G.F. and Soejarto, D.D.** 2005. Factors in maintaining indigenous knowledge among ethnic communities of Manus Island. *Economic Botany*, 59:356–365.
- Chipeniuk, R.** 1995. Childhood Foraging as a Means of Acquiring Competent Human Cognition about Biodiversity. *Environment and Behavior*, 27(4):490–512.
- Cocks, M.** 2006. Biocultural Diversity: Moving beyond the Realm of 'Indigenous' and 'Local' People. *Human Ecology*, 34(2):185–200.
- Crystal, D.** 2000. *Language Death*. Cambridge, Cambridge University Press.
- Ellen, R., Parkes, P. and Bicker, A. (eds.)** 2000. *Indigenous Environmental Knowledge and its Transformations*. Amsterdam, Harwood Academic Publishers.
- Estomba, D., Ladio, A. and Lozada, M.** 2006. Medicinal wild plant knowledge and gathering patterns in a Mapuche community from northwestern Patagonia. *Journal of Ethnopharmacology*, 103:109–119.
- Guest, G.** 2002. Market integration and the distribution of ecological knowledge within an Ecuadorian fishing community. *Journal of Ecological Anthropology*, 6:38–49.
- Harmon, D.** 1996. Losing species, losing languages: Connections between biological and linguistic diversity. *Southwest Journal of Linguistics*, 15:89–108.
- Harmon, D.** 2002. *In Light of Our Differences: How Diversity in Nature and Culture Makes us Human*. Washington, Smithsonian Institution Press.
- Hatano, G. and Inagaki, K.** 1999. A Developmental Perspective on Informal Biology. In Medin, D. and S. Atran (eds.), *Folkbiology*. Cambridge, Mass., The MIT Press. Pp. 321–354.
- Heckler, S. (ed.)**. In press. *Landscape, Power and Process: a new environmental knowledge synthesis*. Oxford, Berghahn Books.
- Hunn, E.** 1999. The Value of Subsistence for the Future of the World. Nazarea, V. (ed.), *Ethnoecology*. Tucson, University of Arizona Press. Pp. 23–36.
- Hunn, E.** 2002. Evidence for the precocious acquisition of plant knowledge by Zapotec children. Stepp, J., Wyndham, F. and Zarger, R. (eds.), *Ethnobiology and biocultural diversity*. Athens, University of Georgia Press. Pp. 604–613.
- Johnson, A.W.** 1975. Time allocation in a Machiguenga community. *Ethnology*, 14:301–310.
- Katz, C.** 1986. Children and the Environment: Work, Play and Learning in Rural Sudan. *Children's Environments Quarterly*, 3(4):43–51.
- Katz, C.** 1989. Herders, gatherers and foragers: The emerging botanies of children in rural Sudan. *Children's Environments Quarterly*, 6(1):46–53.
- Kellert, S.R.** 1985. Attitudes towards animals: Age-related development among children. *Journal of Environmental Education*, 16(3):29–39.
- Kempton, W.** 2001. Cognitive Anthropology and the Environment. In Crumley C.L. (ed.), *New Directions in Anthropology & Environment*. Walnut Creek, Altamira Press. Pp. 49–71.
- Ki-fong Au T. and Romo, L.F.** 1999. Mechanical Causality in Children's 'Folkbiology'. In Medin D., and Atran, S. (eds.), *Folkbiology*. Cambridge, Mass., The MIT Press. Pp. 355–401.
- Krute, L.** 1989. *Piaroa Nominal Morphosemantics*. Ph.D. thesis. Columbia University, Ann Arbor: University Microfilms International.
- Lave, J. and Wenger, E.** 1991. *Situated Learning: Legitimate peripheral participation*. Cambridge, Cambridge University Press.
- Lee, R.A., Balick, M.J., Ling, D.L., Sohl, F., Brosi, B.J. and Raynor, W.** 2001. Cultural Dynamism and Change – An Example from the Federated States of Micronesia. *Economic Botany*, 55(1):9–13.
- Loh, J. and Harmon, D.** 2005. A global index of biocultural diversity. *Ecological Indicators*, 5(2005):231–241.
- Lozada, M., Ladio, A. and Weigandt, M.** 2006. Cultural Transmission of Ethnobotanical Knowledge in a Rural Community of Northwestern Patagonia, Argentina. *Economic Botany*, 60(4):374–385.
- Luoga, E.J., Witkowski, E.T.F. and Balkwill, K.** 2000. Differential utilization and ethnobotany of trees in Kitulanhalo Forest Reserve and surrounding communal lands, eastern Tanzania. *Economic Botany*, 54:328–343.
- Maffi, L.** 2001. Linking Language and Environment: A Coevolutionary Perspective. In Crumley C.L. (ed.), *New Directions in Anthropology & Environment*. Walnut Creek, Altamira Press. Pp. 24–48.
- Maffi, L.** 2005. Linguistic, cultural, and biological diversity. *Annual Review of Anthropology*, 34:599–617.
- Melnik, M.** 1993. *The contribution of forest foods to the livelihood of the Huottuja (piaroa) people of southern Venezuela*. Ph.D. thesis, University of London, UK.

- Miller, M.L., Kaneko, J., Bartram, P., Marks, J. and Brewer, D.D.** 2004. Cultural Consensus analysis and environmental anthropology: Yellowfin tuna fishery management in Hawaii. *Cross-Cultural Research*, 38:289–314.
- Nettle, D. and Romaine, S.** 2000. *Vanishing Voices: the extinction of the world's languages*. Oxford, Oxford University Press.
- Ohmagari, K. and Berkes, F.** 1997. Transmission of Indigenous Knowledge and Bush Skills Among the Western James Bay Cree Women of Subarctic Canada. *Human Ecology*, 25(2):197–222.
- Reyes-Garcia, V., Vadez V., Byron, E., Apaza, L., Leonard, W.R., Pérez, E. and Wilkie, D.** 2005. Market Economy and the Loss of Folk Knowledge of Plant Uses: Estimates from the Tsimane' of the Bolivian Amazon. *Current Anthropology*, 46(4):651–656.
- Reyes-Garcia, V., Vadez V., Huanca T., Leonard W.R. and McDade, T.** 2007. Economic Development and Local Ecological Knowledge: A Deadlock? Quantitative Research from a Native Amazonian Society. *Human Ecology*, 35(3):371–377.
- Romney, A.K., Weller, S.C. and Batchelder, W.H.** 1986. Culture as Consensus: A Theory of Culture and Informant Accuracy. *American Anthropologist*, 88(2):313–318.
- Romney, A.K., Batchelder, W.H. and Weller, S.C.** 1987. Recent Applications of Cultural Consensus Theory. *American Behavioral Scientist*, 31(2):163–177.
- Rosch, E.** 1977. Human Categorization. In Warren, N. (ed.) *Studies in Cross-Cultural Psychology*. London: Academic Press.
- Ross, N.** 2002. Cognitive aspects of intergenerational change: Mental models, cultural change, and environmental behavior among the Lacandon Maya of southern Mexico. *Human Organisation*, 61:125–138.
- Ross, N. and Medin, D.L.** 2005. Ethnography and Experiments: Cultural Models and Expertise Effects Elicited with Experimental Research Techniques. *Field Methods*, 17(2):131–150.
- Stepp, J.R., Cervone, S., Castaneda, H., Lasseter, A., Stocks, G. and Gichon, Y.** 2004. Development of a GIS for Global Biocultural Diversity. *Policy Matters*, 13:267–272.
- Stross, B.** 1973. Acquisition of Botanical Terminology by Tzeltal Children. In Edmonson, M.S. (ed.) *Meaning in Mayan Languages*. The Hague: Mouton. Pp. 107–141.
- Toledo, V.M.** 2002. Ethnoecology: A Conceptual Framework for the Study of the Indigenous Knowledge of Nature. In Stepp, J., Wyndham, F. and Zarger, R. (eds.) *Ethnobiology and biocultural diversity*. Athens: University of Georgia Press. Pp. 511–522.
- Villalón, N.D.** *Una Apreciación de la Vitalidad Lingüística en Venezuela*. Unpublished Manuscript.
- Voeks, R.A. and Leony, A.** 2004. Forgetting the Forest: Assessing Medicinal Plant Erosion in Eastern Brazil. *Economic Botany*, 58 (Supplement):S294–S306.
- Zarger, R.** 2002. Acquisition and transmission of subsistence knowledge by Q'eqchi' Maya in Belize. In J. Stepp, F. Wyndham and R. Zarger (eds.). *Ethnobiology and biocultural diversity*. Athens: University of Georgia Press. Pp. 593–603.
- Zarger, R. and Stepp, J.** 2004. Persistence of Botanical Knowledge among Tzeltal Maya Children. *Current Anthropology*, 45(3):413–418.
- Zent, S.** 1992. *Historical and Ethnographic Ecology of the Upper Cuao River Wóthhā: Clues for an Interpretation of Native Guianese Social Organisation*. PhD Dissertation Columbia University, New York. xii + 478 pp.
- Zent, S.** 1994. *Agricultural Transformations among the Piara Indians of the Venezuelan Amazon*. Paper presented at the 48th International Congress of Americanists, Uppsala, Sweden. July, 1994.
- Zent, S.** 1995. Clasificación, Explotación y Composición de Bosques Secundarios en el Alto Río Cuao, Estado Amazonas, Venezuela. *Scientia Guaianae*, 5:79–113.
- Zent, S.** 1997. Piara and the Cracidae: Game Management under Shifting Cultivation. In Strahl, S., Beaujon, S., Brooks, D.M., Begazo, A.J., Sedaghatkish, G. and Olmos, F. (eds.). *The Cracidae: Their Biology and Conservation*. Hong Kong: Hancock House Publishers, LTD. Pp. 177–194.
- Zent, S.** 1999. The Quandary of Conserving Ethnobotanical Knowledge: A Piara Example. In Gragson, T. and Blount, B. (eds.) *Ethnoecology: Knowledge, Resources, Rights*. University of Georgia Press. Pp. 90–124.
- Zent, S.** 2001. Acculturation and Ethnobotanical Knowledge Loss among the Piara of Venezuela: Demonstration of a Quantitative Method for the Empirical Study of TEK Change. In Maffi, L. (ed.) *On Biocultural Diversity: Linking Language, Knowledge, and the Environment*. Washington, D.C.: Smithsonian Institution Press. Pp. 190–211.
- Zent, E.L. and Zent, S.** 2004a. Floristic Composition, Structure and Diversity of Four Forest Plots in the Sierra Maigualida, Venezuelan Guayana. *Biodiversity and Conservation*, 13: 2453–2483.
- Zent, E.L. and Zent, S.** 2004b. Amazonian Indians as Ecological Disturbance Agents: The Hoti of the Sierra Maigualida, Venezuelan Amazon. In Carlson, T. and Maffi, L. (eds.) *Ethnobotany and Conservation of Biocultural Diversity*. Advances in Economic Botany. Vol. 15. Bronx: New York Botanical Garden Press. Pp. 79–112.
- Zent, S. and Zent, E.L.** 2004. Ethnobotanical Convergence, Divergence, and Change among the Hoti. In Carlson, T. and Maffi, L. (eds.) *Ethnobotany and Conservation of Biocultural Diversity*. Advances in Economic Botany. Vol. 15. Bronx: New York Botanical Garden Press. Pp. 37–78.
- Zent, S. and Zent, E.L.** 2007. On Biocultural Diversity from a Venezuelan Perspective: tracing the interrelationships among biodiversity, culture change, and legal reforms. In McManis, C. (ed.) *Biodiversity and the Law: Intellectual Property, Biotechnology and Traditional Knowledge*. London: Earthscan Publications. Pp. 91–114.
- Zent, S., Zent, E.L. and Marius, L.** 2001. *Informe Final del Proyecto S1 'Etnobotánica Cuantitativa de los Indígenas Joti de la Región Circum-Maigualida, Estados Amazonas y Bolívar, Venezuela'*. Preparado para el Consejo Nacional para la Investigación Científica y Tecnológica (CONICIT), Ministerio de Ciencia y Tecnología, República Bolivariana de Venezuela. 275 pp.





**BIODIVERSITY REGENERATION AND INTERCULTURAL KNOWLEDGE
TRANSMISSION IN THE PERUVIAN ANDES**

JORGE ISHIZAWA & GRIMALDO RENGIFO



INTRODUCTION

THERE is currently a widespread recognition among the traditional authorities in Andean Amazonian communities that their present lack of well-being is due to a generalised loss of respect for each other, and for their deities and nature. In the central Andes, this situation appears to be one of the consequences of modernist ideologies about progress, held by reformers of all types during the past century. The consequence of loss of respect is the increasing threat to biodiversity conservation in the central Andes, which is recognised as one of the planet's major sites of biological diversity and as one of the 'centres of the origins of agriculture'.¹

THIS paper presents two programmes carried out in the past decade by local community based organisations coordinated by PRATEC (Proyecto Andino de Tecnologías Campesinas), the Andean Project for Peasant Technologies. The first programme, titled 'Children and Biodiversity', highlights the central role played by children in the regeneration of biodiversity. As the loss of respect in the communities seems to have increased with modernist schooling, that the communities themselves should nurture their school is given special emphasis in this programme. This requires teaching that is based on the community's own educational culture. This needs specific attention to the ways in which the intergenerational transmission of knowledge

¹ In 1926 the Russian agronomist Vavilov proposed a theory explaining the origin of domestic crops. According to this theory, the geographic region where the greatest genetic diversity of a particular crop was found was the region of its origin. The central Andes were thus identified as one of eight 'centres of origin' (Harlan 1992: 48–53).



takes place, in which the use of local languages is crucial.

THE second programme, the 'In-Situ Project', is based on the ritual agriculture practiced in the central Andes for millennia, and its role in agrobiodiversity conservation. The Andean *campesinos* (peasants) maintain a cosmivision in which diversity is a key aspect of life and they therefore nurture the diversity of plants and animals. This is the specific contribution of these lands to the well-being of humankind.

BACKGROUND

THIS paper refers to the diverse peoples living in the Peruvian Andes, a highly varied geographical configuration encompassing not only the sierra or highlands, but an entire area in which people share a similar worldview. It consequently includes the Andean high mountains and their western and eastern piedmonts, the narrow coastal strip of desert land interrupted by temporary rivers and water courses, and the Upper Amazon region.

Peruvian Andes

THE main characteristic of the Peruvian Andes is their high ecological diversity. According to Valladolid, Tosi (1985), using Holdridge's (1978) concept of 'life zones', identified in Peru 82 of the planet's 103 life zones, that is 80 per cent of the ecoclimatic zones existing on the planet (Valladolid 1998: 52). Climatic phenomena, like rains, temperature, humidity and frost, vary drastically according to altitude, slope, exposure, latitude and longitude. The coastal desert area, the arid western slopes and the interandean valleys and heights condition climatic regimes characterised by short rainy seasons in the summer (January to March). Generally – except for in localised inversion points – rain correlates with altitude and at higher altitudes rain is more abundant (Mayer 1981: 19). The reverse is true of temperature, which decreases with altitude, and the average

temperature of the highlands is lower than that in the valleys. There are also drastic seasonal variations. Climate in the Andes changes constantly; the 'average' climate is not experienced and extreme fluctuations are the norm.

THE heterogeneity and variability of the climate, both temporally and spatially, contribute to the extreme diversity of plants, animals and human communities that inhabit the Andes. The challenges posed by this environment are met by these human communities with a repertoire of knowledge which allows them to 'converse' with any kind of climate in such a way that agricultural produce is always generated (Valladolid 1994: 322).

PRATEC was founded in 1987 with the objective of recovering and disseminating this knowledge in the form of technological booklets. At this time, two decades had elapsed since one of the most radical changes in the rural property regime of the Andes had been implemented through a massive agrarian reform.² Throughout the Andes, large plantations and *haciendas*³ were substituted for cooperative firms owned by their former workers. Later these firms were transformed into communities and other associative forms. As a result, the major characteristic of the Andean rural productive structure became, and remains, the peasant community and small farm production.

² In 1969 the military government headed by General Juan Velasco Alvarado initiated a process of radical social and economic change in Peru with an agrarian reform.

³ *Haciendas* were large estates for export crops like sugar and cotton in the coastal area, and for cattle and sheep in the highlands. They were a legacy of the Spanish colonial period and continued in the Republican period as the economic base of the rural oligarchy.

SOME data will be given here to demonstrate the importance of the *campesinos* or peasant farmers in Peruvian life and the reasons for valuing their knowledge. According to the last agricultural census in 1994, 85 per cent of the 1,745,733 farms were peasant farms of less than 10 ha. There is no other economic sector in Peru that incorporates such a sizeable population, some 7,372,625 people. Peasant families work the land in different modes of cooperation, and the peasant community is the most important organisation in the rural sector. More than 50 per cent of the peasants (approximately 751,571 families) belong to communities (Valera Moreno 1998: 20). By 1998, peasant communities numbered 6,872 and were located in the coastal area, the highlands and the Amazon region. Most of these communities include the fifty-eight Quechua, Aymara and Amazonian ethnic groups. However, despite 85 per cent of farms being peasant small-holdings, this represents only 10.5 per cent of the total agricultural land – 35,381,808 ha in 1994. Yet it is estimated that up to 60 per cent of the fresh produce that reaches the urban markets comes from the peasants' *chacras* or cultivated fields (Earls 1998: 19). Such agriculture is mainly based on local practices and inputs, and the

majority of fresh food in the country is therefore produced through the *campesinos'* knowledge.

THE central Andes is one of the eight global 'centres of origin' for agriculture and exhibits the highest interspecific and intraspecific diversity of cultivated plants in the world. This diversity is found in the peasants' *chacras* and its persistence is owed to the care, protection, affection and respect that the peasants show toward their plants. Peasant culture, agriculture and biodiversity are thus inextricably linked; one cannot be understood without understanding the others. The knowledge embodied in the peasants' practices is that which is often referred to as 'traditional' or 'local' knowledge. Against this background, we shall attempt to explore its intergenerational transmission.

PRATEC'S VIEW OF KNOWLEDGE GENERATION IN THE ANDES

AT present PRATEC holds one of the most important catalogues of agricultural practices in the Andes. Some 2,500 peasant practices are documented in booklets of on average eight pages

Sowing potato seeds in Ayacucho, Peru



Harvesting beans, Lamas, San Martin



in length. One hundred copies of these have been printed to support the activities of a number of libraries and interested groups, mostly peasant communities and educational institutions. A number of the booklets are returned to the *campesinos* who authored them, and help to animate conversations and to re-create this knowledge in diverse settings. The booklets cover different aspects of *campesino* practice, from soil diversity, microclimates and ways of nurturing water and landscape, to the signs read in nature for sowing, harvesting, processing and storing the diversity of cultivated plants. They also cover handicrafts, dances, food diversity, rituals and how to nurture the diversity of domestic animals.

THIS activity attracted debate from its inception. Some people considered that, before being disseminated, such knowledge should be tested for validity through the protocols of scientific research. In PRATEC it was however considered that this knowledge had already proved its worth through the experience of living in harmony with the Andean environment for millennia. This knowledge therefore deserved to be understood and respected within the cosmivision of the cultures in which it had prospered. In comparison, the poor results of four decades of 'development programmes' founded on scientific knowledge were evident when the PRATEC research process was initiated. Peru had not only become less independent as a result of an industrialisation process

based on import substitution, but the agricultural indices for production and productivity had also decreased on average. As a result the country joined the net food importing countries in the world. Development had not fulfilled its promise, and yet development had been predicated on the eradication of the native cultures as the price to be paid for progress (Escobar 1995: 20).

THIS recognition of the success of local knowledge and the limitations of science led PRATEC to explore an alternative approach that is based on a legitimate understanding of our peoples' life-world. This process of cultural regeneration demanded not only a new attitude and conceptual framework but also different training from that of mainstream 'rural development experts'. Developing an understanding of the cosmivision that fundamentally underpins traditional knowledge in the Andes was therefore essential. This cosmivision and knowledge will therefore be explained now, before we turn

to the other projects in which PRATEC is also involved, which are also intimately linked to this understanding of traditional knowledge in the Andes.

ANDEAN COSMOVISION AND TRADITIONAL KNOWLEDGE

COSMOVISION

AGRICULTURE and culture are one and the same in the Andes, in such a way that a seed is considered to carry in it the culture in which it has sprouted. In the modern technical tradition, soils, water, forests and animals are considered to be resources, which humans can utilise and manage for their benefit. In modern thought nature is an object, from which the subject, the human being, is considered to be removed. In contrast, in the Andean life-world the relationship between humans and nature is filial and full of feeling. For example, how can one understand a ritual to *Pachamama* (Mother Earth),⁴ by adopting a mechanistic worldview that perceives nature as a set of objects to be manipulated and exploited?

FOR the human communities of the *ayllu* (the natural collectivity or extended family that inhabits the local world (*pacha*) and includes deities and nature), all entities in their world are alive. The mountains are considered to be protecting deities who can speak, nurture plants and animals and take a turn as authorities in nurturing the *pacha*, just as any member of the human community. In the same way,

⁴ *Pachamama* is honoured and receives all kinds of offerings in every event of the agricultural cycle. For instance, in a very simple ritual, She is offered a triplet of coca leaves (*quintu*) when asking Her for permission to plough.

the Earth is not an inert receptacle of plants. It is *Pachamama*, a living being who is mother of all that exists, including human beings. Jesús Urbano Rojas, a renowned artisan from Ayacucho, expresses it thus:

I myself am the child of my parents, may they rest in peace, but I am also a son of Pachamama...
(Urbano and Macera 1992: 164)

THE same can be said of the wind, the rocks, the hail and the rivers. It is common in the Andes to hear people say ‘rivers walk’ or ‘the *Apus* or mountain deities nurture us’ or ‘seeds walk’. As every aspect of the environment is alive, even the rocks, they are all involved in and subject to processes of regeneration and growth.

TO value this knowledge on its own terms requires a different relationship with the world from that of a Western-trained scientist. Needed instead is an attitude of attuning oneself with the entities of the world, being open to them and of letting oneself be penetrated by them, in order to live and to fully appreciate the experience, and thus to accompany its recreation and strengthening. Water festivals, for example, are instances of this experience. Water is a person and humans dance with her to propitiate her and ensure her regeneration (Machaca 1998: 1–69). In such an understanding, life is a web of which one person is just a thread.

Feast of the Cross in Ayacucho

LEARNING

THE testimony of Santos Cahuana from the community of Huayllapampa in Cajamarca illustrates the way community members learn to attune themselves to the circumstances of the agricultural cycle:

Some things we can learn from our thinking, and other things, watching. That way we learn, and also by listening. We campesinos do not study to learn. We do it this way because for the farmer each year is different and every year we have to learn. For instance, from what we see this year, we have to drain our chacras.
(Vásquez 1998: 39)

THE testimony of Don Domidel Sangay from the community of Cashapampa in Cajamarca, northern Peru further illustrates how such transmission took place:

Learning is very easy, you just watch and practice. From childhood you learn to work, to do things, watching those who do. Thus you learn well.



This is the way to learn the secrets of the chacra... For instance, if the soil is hard, we wait for rain. You may have to sow late in the season... As you work you learn. To water your plants you know where water goes. We already know the time to plough, where and what to sow... Learning is being happy. You should leave work that you do not like. Any task should be done with affection. I have faith in agriculture. It seems that I can see how the plants are going to grow... My father did not like the chacra and I do. I used to go with my grandparents.
(Vásquez 1998: 34)

DON Cruz Huaccha Fernández from the community of Choropunta in Cajamarca gives more details on how such intergenerational transmission of knowledge takes place:

I learned watching the elders, [for instance] working with the yoke. Our parents taught us to yoke the oxen, first the tamer one, then the other could be brought near to accompany the other. Then you teach the oxen to plough. To reap the grain you also learn from childhood seeing how your parents or your elder brothers work, how they do it, and we learn from it. We learn to work this way, because some of us are very keen. We accompany our father, with our grandparents, we go together to work. We also watched our elders form the pile of grain and we went along to the piling of soil around potato plants too. From early childhood we took our small pick to the plot of potatoes, or maize. From very early childhood we went to the chacra, following behind our father. We looked at how they cut and did likewise... We, the campesino farmers, learn like playing

from early childhood. That is what we do and we do it because we like it... Our parents also knew well how to cure people and animals. We cure ourselves with the herbs from the field... we could treat each other for every disease. I am illiterate, I can only write my name. This I learned only by watching. I saw, looked at what they wrote on the blackboard. I watched that, I also copied it, they wrote my name and I too did likewise. I learned to write my name that way, watching, watching I learned... (Vásquez 1998: 35–6)

PARTICIPATING in community celebrations is also another important way of learning to become a full member of the community. Don Trinidad Huaccha Minchán from the community of Paccha in Cajamarca recounts:

For the community celebrations, our parents themselves taught us how the festival was done and when you grow up, you remember the celebration as you saw it and what is done is just what your parents did. But formerly festivals were better and my grandparents say that in the old times it was much better because the land produced a lot more... They believed in the saints and they had lots of rain. The crops grew much better and they harvested plenty. The saints also harvested and there were good festivals. Now it has become scarcer, more changed, the land does not produce and from everywhere

plagues come while formerly there was no plague. (Vásquez 1998: 36–7)

FOR someone who values a culture, to know it on its own terms implies participating in the festivals and rituals, to fully experience that culture in order to be able to show it to other people.

CAMPESINO KNOWLEDGE AS 'LOCAL' KNOWLEDGE

TWO critical characteristics of Andean knowledge resulting from what has been described above are that it is circumstantial and local. The technological booklets produced by PRATEC show the practices of a family or a community and do not pretend that such practices could be exactly reproduced elsewhere. The *campesinos* say, when referring to the way they carry out some agricultural task, 'this is the way I do it'. Never will they be heard saying, 'this is the way to do it'. They know that the method of nurturing potatoes in their *chacra* is different from the neighbouring *chacra*. Soil type changes over very small distances, the microclimate in each plot is specific and the varieties of potato sown are not similar. Each *chacra* is even given a different name to distinguish its personality. Knowledge is intimately associated to a particular place. It is thus local. In the absence of homogenous production zones, as indicated above, the salient

characteristic is heterogeneity both in space and time. Each agroclimatic cycle differs from the previous ones. There may be an intense rainy season (*para wata*) or a dry year (*chaqui wata*). Each practice is useful in a given situation.

THE knowledge possessed by a family or a community cannot therefore claim to be universal. The most that can be done is to attune it with the particular circumstances of a given *chacra* in any given situation. Re-creation is the expression for nurturing diversity. A *campesino* tells what he knows to those who value his experience with only the wish of initiating conversation with his peers. These conversations become holistic dialogues. The conversation revolves around the attributes of the seeds, including preferred soils and sowing period, but also around the secrets of nurturing them: relationships with the phases of the moon, the cycles of women, with the hand of the nurturer and with the community's festivals and rituals. Everyone will do what is pertinent and convenient in his own *chacra*. The testimony of Don Zenón Gomel Mamani, a *campesino* from the ayllus Colquejahuá and Koriñahui in the Quechua part of the Southern altiplano of Puno, is very telling of the *campesinos'* creativity and readiness to adapt to changing conditions. Farmers in his community had become used to

Preparing soil for sowing



©Julia Chertel

Children meet the village elders in Lamas, San Martin, Peru



© Ilda Gonzales

tractors in labouring their fields but, owing to drastic economic policy change at the beginning of the 1990s,⁵ he turned to donkeys to pull an oxen plough.

I had already seen a man working his chacra in Chijnaya with donkeys pulling the plough. I wondered how he did it and just then the tractor rental went up. Pedro Zanga from Ayrapuni sold me one of his ploughs and with him we tied the donkey to it. As I did not know how to do it, I tied the plough between the two donkeys thinking that together they would give more strength. I tied clothes to their back and chest so that the ropes would not hurt them. They pulled for a long time. They tired too quickly. One of the donkeys was very capricious; it would fall all the time. It would even kick the other. Besides, they did not go straight because each of the donkeys pulled to its own side. We sowed oats for several days... Pedro pulled the two donkeys by their rubber collars and I

drove the plough while whipping them. I had never driven an oxen plough and I saw that it required skill. You have to know how to drive it. At first I was very tired and I finished with a pain in my back. The following years I have tried it with only one donkey. That was better because one drives it well and turns easily. It also was unnecessary to tie so many clothes. I placed a pillow on its chest and that was enough to keep it from hurt. One donkey alone works well, two just disrupt each other. (Asociación Savia Andina Pucará 1998: 21)

THE case of the community of Tuni Grande in the same area is also interesting from the perspective of adaptation to a different environment and the local nature of *campesino* knowledge. In 1986 a group of community members migrated from the district of Taraco on the shore of Lake Titicaca, displaced by the flooding of their lands. Taraco is situated on a sheltered plain that allows two harvests of crops a year. The soils have a relatively light texture that facilitates easy ploughing. The community migrated to their new area with their own distinct culture, strongly conditioned by their conversation with the lake. In their new home in Pucara, in the district of Ayaviri some 80 km away, they had to

learn many aspects of the local culture and environment. The result of making their *chacras* on the plain was the total destruction of their sown fields by frost, so now they practice agriculture on the slopes. At first, however, when they attempted to make *chacra* on the slopes they did not have the proper tools. Oxen ploughs do not penetrate in virgin soil, and the possibility of success was even more reduced on steep ground. However, they learned the use of the *chaquitacla*, a hand plough, from their neighbours. The tool was recreated by the newcomers in a very peculiar way, reversing some of its elements. The plots that they adopted in the slopes were similar to the ones they kept near the lake, small in size and with a diversity of crops. Among the new wild foods they found were *sancayo* and llama, which they quickly adopted. Also remarkable was their quick familiarisation with the wild animals of the place (ASAP 1998: 24).

LOCAL knowledge in this understanding sprouts from a given landscape to which a human community belongs and with which it interacts. In the case of the Andes, this locality is called *pacha*, a word that refers to a territory of ritual and plastic boundaries, which is nurtured by the human community that inhabits it while the *pacha* simultaneously nurtures that community.

KNOWLEDGE that is expressed in traditional wisdom permits living together in tune and empathy with the reality in which we live, with no mediation by thought. What is most characteristic of such knowledge is its relational and holistic qualities rather than its analytical quality. Such qualities are shared by all beings that inhabit the *pacha* or local world. In Quechua the word *yachay* expresses that what we know results from the affectionate conversation among

⁵ In August 1990, the newly elected government applied a harsh economic programme after the mismanagement of the previous government. Prices rose to such levels that consumption was reduced to a minimum. The rural population was less affected regarding food but reliance on external inputs (petrol and tractors) was heavily taxed.

Altiplano region in Peru



©Julia Chafel

humans, nature and deities. There are numerous ways to attain *yachay*: the senses, dreams, the mind and revelations (Rengifo 2005: 4–8). The result of these conversations is not a technical manual but multiple suggestions and possibilities for nurturing life. The knowledge recorded in the PRATEC booklets is considered to be like a person who initiates dialogue. It allows all those who did not know a certain practice – whether because it had been forgotten in the community or because it came from a different culture – to consider the possibility of re-creating it. This is one way of nurturing the diversity of knowledge.

THE CHILDREN AND BIODIVERSITY PROGRAMME

SINCE 2002, PRATEC has also been conducting a programme called ‘Children and Biodiversity’. It coordinates the fieldwork of seven community based organisations (CBOs),⁶ of which six are located in the Andean highlands and one in the Upper Amazon region. The programme has an important educational component that seeks to incorporate local knowledge into the school

⁶ These community-based organisations (CBOs) are small institutional setups founded formally as NGOs by graduates of the Course on Andean *Campesino* Agriculture that PRATEC has offered from 1990 to 1999 in agreement with the state universities of Ayacucho and Cajamarca. These CBOs are autonomous from an administrative and financial point of view.

curriculum and to involve parents in school activities. It also aims to restore the autonomy and authority granted to children in the traditional system of governance, as in the past children were able to exercise control within the community, for instance taking care that animals did not enter the *chacras* and sanctioning those who let their animals trample their neighbours’ crops. The focus of the Children and Biodiversity Programme was thus to explore the possibility of the community nurturing its school. In its second phase (2005–2007), the objective of the programme was to outline the characteristics of a culturally friendly rural school in the context of the recovery of respect in all its manifestations. The project strategy regarding knowledge transmission adopted an intercultural approach allowing the coexistence of diverse ‘educational cultures’. The concept of educational culture refers to the modes of intergenerational knowledge transmission of a given community (Rengifo 2005: 3–46). It appears to be a particularly useful one in order to go beyond the dualism between home-based *versus* school-based local/indigenous knowledge transmission. The project strategy included the training of rural teachers as cultural mediators, capable of integrating local knowledge into the school curriculum. Also included is the consolidation of orality

as a basis for literacy. Overall, the programme was based on the recognition of the community’s educational culture and the consideration that schooling must be incremental to it.

THE broad focus of the project was determined through conversations with traditional authorities in the Andean Amazonian rural communities, during a one-year exploration in 2002 in almost twenty places all over the country. The initial indication came from the highlands of Ayacucho. The traditional authorities in charge at the time attributed the present difficulties and lack of well being in their communities to a generalised loss of respect among all beings in their *pacha* or local world. This lack of respect was not only found among human community members but also from humans towards their deities and natural entities. According to the communities’ traditional authorities, one of the major contributors to this situation was the rural school.

HOWEVER, they were not demanding that their teachers pack up and leave their community. Neither were they asking for the state’s educational reforms. Nor were they prodding their children to ‘escape education’ as social activists were proposing. Of course, they recognised that the educational pact with the

TABLE 1 The attributes of the educational cultures currently found in Andean Amazonian communities, presented in contrasting forms (Rengifo 2005: 27)

Criteria	Educational culture in official schools	Andean Amazonian educational culture
Relationship to the world	Thinking Distance between humans and nature Predominance of abstraction and experimentation 'Book learning'	Lived experience Immediacy Predominance of senses and emotions Transmission of knowledge through living
World view	World as a machine Nature as a resource	World as alive World as a weave of kinship
Validity of knowledge	Universal 'This is how it is done' Homogeneity	Local 'This is how I do it' Diversity
Orientation of knowers	Individual Only experts know Theoretical	Residing in the Ayllu All know Practical
Objectives of learning	Transformation of nature	Mutual nurturance with nature
Language	Written	Oral
Sphere of proper application	Industry	<i>Chacra</i> , the cultivated field
Sphere of transmission	Institutionalised	Contextual
Concept of childhood	Chronological Play as distraction	<i>Wawa</i> , ⁷ a holistic concept Play as celebration, learning and announcement
Concept of work	A means of making a living	A way of life
Application of learning	Reproduction or repetition	Re-creation under given circumstances

7 *Wawa* both in the Aymara and Quechua languages is usually translated as 'small child' or 'baby'. However, the concept of *wawa* goes beyond an age-based condition. *Wawa* is anyone that is being nurtured and, in this sense, all of us are *wawas*.

state on which the present educational system is predicated had already proven obsolete. As we found out through conversations facilitated by the project activities, the new educational pact with the state that rural communities are now demanding takes the form of what in the Aymara language, spoken in the Altiplano area of Puno, is expressed as *Paya Yatiwi*, and in the *Quechua* language as *Iskay Yachay*. The phrase means 'two kinds of knowledge' and expresses the

Seed exchange in Lamas,
San Martin



demand of the Andean Amazonian rural communities for ‘two kinds of knowledge’ to be taught in school: their own and the modern project of literacy, science and technology. The communities realise that the present educational system does not prepare young people for life, and parents are sorely aware of this fact. Table 1 contrasts the ways of learning and knowing utilised in *campesino* agricultural activities with those found in the didactic educational regimes in Peruvian schools.

THE central finding of the Children and Biodiversity Project is that *Paya Yatiwi/Iskay Yachay* has three interrelated components:

- 1 the recovery of respect in the community (towards their deities and environment and among the community members themselves);
- 2 learning to read and write respecting and valuing their oral tradition; and
- 3 teaching the ‘seven skills’⁸ that allow people to ‘pass life’, that is, to live a good life.

AS we discovered, the demand that the two kinds of knowledge be taught at school poses the radical challenge of a school promoting cultural diversity based on the community’s educational culture oriented to ‘passing life’. In that context, the school’s contribution should be complimentary to, and enhance, the community’s educational culture.

⁸ There are not in fact seven defined skills. This appears instead to be a linguistic expression in Quechua *canchis oficio*, a mixture of Quechua and Spanish. ‘Canchis’ means ‘seven’ in Quechua and ‘oficio’ means ‘profession’ or ‘skill’ in Spanish. Our research so far suggests that that it refers to being useful and diligent in the service of the community.

THE ROLE OF LOCAL LANGUAGES IN KNOWLEDGE TRANSMISSION

WHEN attempting to teach ‘two kinds of knowledge’ in schools the difference between oral and written languages can become especially important. We will therefore discuss these issues here. The predominant languages in the Andean Amazonian communities are mainly oral, that is, not much informed by writing, whether Spanish, *Quechua* or *Aymara*. People in these communities are exposed to literacy and thus we cannot speak of a primary orality, but the common language is generally spoken and heard rather than written and read. Since everything in the world is alive and everything is a person, everything speaks. Language is not an attribute that is exclusive to the human community. Nature has a voice and expresses itself through what human beings call signs.

THE meaning of words is contextual, and understanding them sends one back to the context in which they were uttered. Since activities are not repetitive but are re-created, words also express the re-created situation. Words

are also circumstantial. Universal words, designating concepts or ideas which transcend contexts, do not exist. It is interesting for instance that there is no word for ‘respect’ in the indigenous languages. The meaning is transmitted through the description of the attributes of a person who is respectful (Machaca 2001). This is not to suggest that *campesinos* do not have ideas or mental representations. Rather, what is found here is that thought, as a mental attribute, does not obliterate other ways of knowing. There is also no separation between a word and what it names; the word is not a representation of what is named, but is what is named. Thus to speak of an object, situation or event is to bring it into existence. Hence there are expressions or words which are not spoken in some circumstances. Gestures, dance, music and silence also have meaning.

THE dominant language in the official educational system is the written one, Spanish, based on the use of the alphabet. The official educational culture has promoted literacy as one of the major achievements that the school can offer as a step from the primordial to modernisation. It has done this in substitution of



Children learning to weave in Ancash (left) and in Ayacucho (right), Peru

Children learning pottery (left) and to weave baskets (right) in Lamas, San Martín, Peru



the orality that is characteristic of the indigenous languages in the central Andes. Furthermore, in intercultural bilingual education programmes, indigenous languages have been made instrumental to the transmission of contents alien to the community's educational culture.

WHEN local languages are subject to standardisation and are written down to make them suitable for use in the schools, the speech of Andean children ceases to express the warmth and liveliness of circumstances and becomes rigid (*qatqi simi*, insipid, as the Quechuas from Huaracaya, Ayacucho say). When written, a word is separated from what it names, so one can write something that may not take place and express general ideas, but also lie and become a person 'with a double heart'. Words become superficial, without the depth and 'weight' they have in orality. The challenge for a culturally friendly school is to integrate the technology of writing into the framework of orality.

THE IN SITU PROJECT

PRATEC also participated in a project for the *in situ* conservation of the diversity of native plants and their wild relatives in centres of origin of agriculture: the In Situ Project (2001–2005). Its stated objective was to conserve agrobiodiversity in the *chacras* of *campesino* farmers in fifty-two locations in Peru. The project addresses six areas of intervention:

- 1 the *chacra* and its surrounding space;
- 2 the social organisation of *in situ* conservation;
- 3 awareness of the importance of maintaining the diversity of native cultivated plants and their wild relatives;
- 4 policies and legislation to promote *in situ* conservation;
- 5 market development for agrobiodiversity; and
- 6 an information system for monitoring agrobiodiversity.

THE execution of the first three involves field work, and has been contracted out to six implementing agencies, including two government research organisations and four NGOs. PRATEC is one of the latter and coordinates ten local CBOs in four different regions in Peru: the Altiplano region, the Central Southern highlands, the upper Amazon region of San Martín and the northern department of Cajamarca. PRATEC is thus assisting and coordinating field-

work conducted by these CBOs in a diversity of ecosystems and communities across the country.

THE challenge of the In Situ Project was to stop the genetic erosion of the diversity of native cultivated plants in the central Andes, a global 'centre of the origins of agriculture'. Here the domestication of plants dates back at least 8,000 years (National Research Council 1989: 163) and the aim of the project was to conserve this important repository of genetic resources. An extraordinary interspecific and intraspecific diversity of plants and animals has been nurtured for millennia by *campesino* communities, and this remains a distinctive characteristic of the Andean *campesino* agriculture today. Consequently, *campesinos* should be acknowledged as the real experts in conserving agrobiodiversity. An important part of fieldwork for the In Situ Project has been devoted to gathering data on *campesino* practices and knowledge.

THE objective of collecting this knowledge is twofold. On the one hand, it would establish the legal conditions required to secure compensation for the communities for their contribution to

biodiversity conservation. This is basically the rationale for making such interventions, and we have justified the validity of this assumption elsewhere (Ishizawa 2006: 214–215). On the other hand, the collection aims to develop a knowledge repository that can later be used for research and teaching purposes in order to regenerate the wealth of knowledge about diversity conservation in Andean communities.

IN the execution of the project we found that agrobiodiversity is the result of Andean Amazonian agricultural practices. Here, as in other original agricultural areas, making *chacra* is not a ‘way of making a living’ but a mode of life. Don Humberto Valera from the Upper Amazon region of San Martín refers to making *chacra* and biodiversity:

It seems that we will never finish harvesting this porotal (bean chacra). You produce a lot when you know how to endear yourself with the chacra. Several different varieties appear, some others return...
(PRADERA 1998: 47)

Children in a session with a local healer in Lamas, San Martín, Peru



Communal cooking (left) and women bringing water from a nearby spring (right) in Lamas, San Martín

RESPECT and affection have been found to be the major factors in the regeneration of agrobiodiversity by *campesino* agriculture in the central Andes and Upper Amazon regions. Thus, the major threat to genetic erosion identified by the traditional authorities of the *chacra* is the generalised loss of respect promoted by more than half a century of modernisation efforts in the countryside, which are termed ‘rural development’. This loss of respect expresses itself in the breakdown of the intergenerational transmission of knowledge.

CENTRING on the recovery of respect in the communities involved in the In Situ Project, the CBOs coordinated by PRATEC endeavoured to recover and/or strengthen the traditional authorities of the *chacra* and the *sallqa* (the wild). This was achieved through the strengthening and/or revival of rituals and festivals in the agricultural cycle. Visits between communities for the exchange of seeds and knowledge were also instrumental in the mutual learning that led to the recovery of community memory about how their ancestors generated a sufficiency of food.

CONCLUSION: INDIGENOUS PROJECTS

WHAT we have learned seems to be a good example of Linda Smith’s (1999: 142–162) classification of indigenous projects, understood as the multiple and diverse activities undertaken by indigenous and local peoples for cultural survival, self-determination, healing, restoration and social justice. Indeed, it provides a very useful framework for establishing strategies for intervention with the aim of strengthening intergenerational knowledge transmission. The projects range from formulating claims and collecting testimonies, to remembering, revitalising, reframing and naming (in terms of the indigenous peoples’ own cosmovision), to discovering possibilities. It is our contention that only interventions framed by local or indigenous projects, that may be owned by the people themselves, will have some chance of success. Based on PRATEC’s experience of almost two decades promoting cultural affirmation in the Andes we have witnessed the power of some of these projects. Remembering, revitalising, sharing and reframing have



Making baskets in Lamas, San Martin

been quite effective in the recovery of respect in the communities participating in the programmes mentioned above. We have added a number of projects that appear to be as effective and aim at cultural affirmation. For instance, collecting practices and knowledge is a project that eventually facilitates the incorporation of local knowledge into the school curriculum. Exchange visits are another such project much

appreciated by communities. As a result of the visits, remembering the customs of the ancestors is encouraged and leads to other projects like the recovery of rituals or the strengthening of the role of traditional authorities.

MOREOVER, our experience with the Children and Biodiversity Programme reveals the potential of basing external intervention on the communities' own

understanding of their difficulties and building on their ancestral ways of dealing with them. Thus, *Iskay Yachay/Paya Yatiwi* appears as an indigenous educational project expressing the Andean communities' demand for a radical cultural plurality. *Iskay/Paya* can be translated as 'two' as we have done, but understood in terms of the communities' own understanding is not restricted to Western culture and their own. All cultural traditions are welcome. One can also go one step up the scale and discover that *Iskay Yachay/Paya Yatiwi* expresses indigenous and traditional communities' demands for their rights to their land and an autonomous livelihood as part of Mother Earth.

REFERENCES

- Apffel Marglin, F.** (ed.). 1998. *The Spirit of Regeneration: Andean Culture Confronting Western Notions of Development*. London, Zed Books.
- Asociación Savia Andina Pucará.** 1998. 'Nadie me ha enseñado, yo nomás me he pensado' [No one has taught me, I have just thought it myself]. In PRATEC (eds.), *La regeneración de saberes en los Andes* [The regeneration of knowledge in the Andes]. Lima, PRATEC.
- Earls, J.** 1998. Aportes del conocimiento y las tecnologías andinas en el contexto de la aldea global. In J. Acevedo (ed.), *Desarrollo e Interculturalidad en la Zona Andina*. Lima, Escuela para el Desarrollo, Documento 13.
- Escobar, A.** 1995. *Encountering Development: The Making and Unmaking of the Third World*. Princeton, Princeton University Press.
- Harlan, J.R.** 1992. *Crops & Man*. 2nd Edition. Madison, WI: Crop Science Society of America & American Society of Agronomy.
- Ishizawa, J.** 2006. Cosmovisions and Environmental Governance: The Case of *In Situ* Conservation of Native Plants and Their Wild Relatives in Peru. In Reid, W.V. et al. (eds.), *Bridging Scales and Knowledge Systems: Concepts and Applications in Ecosystem Assessment*. Washington, DC., Island Press.
- Machaca, M.** 2001. Niño, Familia y Comunidad en los Andes [Children, Family and Community in the Andes]. In Brondi, M. (ed.), *Culturas e Infancias* [Cultures and Childhoods], Lima, Terre des Hommes – Germany.
- Machaca, M.** 1998. La cultura agrocéntrica en el ayllu Quispillaccta [The agrocultural culture of the ayllu Quispillaccta]. In ABA (eds.), *Kancha Chacra Sunqulla*. Ayacucho, ABA, pp: 1–69.
- National Research Council.** 1989. *Lost Crops of the Incas: Little-known Plants of the Andes with Promise for Worldwide Cultivation*. Washington, D.C., National Academy Press.
- Rengifo, G.** 2005. The Educational Culture of the Andean–Amazonian Community. *Interculture* 148.
- Smith, L.T.** 1999. *Decolonizing Methodologies: Research and Indigenous Peoples*. London, Zed Books.
- Valera Moreno, G.** 1998. Las comunidades en el Perú. Una visión nacional desde las series departamentales. *Pallay* 1. Lima, Instituto Rural del Perú.
- Valladolid, J.** 1998. Andean Peasant Agriculture: Nurturing a Diversity of Life in the *Chacra*. In Apffel Marglin, F. (ed.), *The Spirit of Regeneration: Andean Culture Confronting Western Notions of Development*. London, Zed Books.



**LOSS OF TRADITIONAL PRACTICES, LOSS OF KNOWLEDGE, AND THE
SUSTAINABILITY OF CULTURAL AND NATURAL RESOURCES:
A CASE OF URAK LAWOI PEOPLE IN THE ADANG
ARCHIPELAGO, SOUTHWEST THAILAND**

SUPIN WONGBUSARAKUM

INTRODUCTION

THIS paper focuses on the transmission of local and indigenous knowledge about marine life and coastal environments among the Urak Lawoi,¹ a formerly semi-nomadic sea people in the Andaman Sea, southwest Thailand. It examines the loss of their knowledge and skills due to the disruption and discontinuation of traditional practices of semi-nomadism and their participation in the market economy via the commercial fishery and tourism industries. The paper points out that the traditional knowledge of the Urak Lawoi is closely linked to their traditional practices of nomadic foraging for subsistence, which were compatible with the sustainability of local marine and coastal resources. It addresses factors that are changing Urak Lawoi ways of life and knowledge transmission. The paper ends by discussing ways to help preserve traditional knowledge in the rapidly changing situation of the Andaman Sea.

BACKGROUND

THIS study focuses on a community of 880 Urak Lawoi people in the Adang Archipelago. The archipelago is located in the southern part of the Andaman Sea, in the Indian Ocean, close to the border of Thailand and Malaysia at approximately 6°30'N 99°15'E. In political

1 Urak Lawoi comes from the word *urak* meaning people and *lawoi* meaning sea.

Wooden Statue of *To Kiri*, the most revered ancestor of Urak Lawoi in the Adang Archipelago (photo previous page)

Last *bagad* site on Lipe Island in 1997 (photo right)

terms, the archipelago belongs to the Satun Province of Thailand and is 74 km offshore to the west of the Thai mainland. The Adang Archipelago covers more than 310 km² and consists of two larger islands (Adang 29.8 km² and Rawi 28 km²), three moderate-sized islands (Tong 4.5 km², Lipe 4.5 km², and Bitsi 1 km²), and some fifteen small islands of only a few thousand square metres. The climate of the archipelago is sub-tropical and is dominated by monsoons. The southwest monsoon brings rains from the Indian Ocean from May through October. During the dry season, from November to April, the northeast monsoon prevails, making the area suitable for tourism.

ALL the islands of the Adang Archipelago are surrounded by crystal clear waters that support a large variety of corals and marine life. Over 210 coral species have been identified in Thailand, and 137 of these species from 47 genera can be found in the Adang Archipelago (Phongsuwan and Chansang 1987: 142). Most reefs are found within a 50 to 300 metre range from shorelines, at a depth of 3 to 12 metres (Phongsuwan and Chansang 1987: 152). In the fish survey conducted by the Phuket Marine Biological Centre in February 1998 (Phuket Marine Biological Center 1998), a total of 288 species belonging

to 54 families were identified in the Adang Archipelago.

ETHNICALLY, the Urak Lawoi belong to the Malay Groups and their language — which is spoken only, without a written form — is part of the Malayo-Polynesian language family. The Urak Lawoi of the Adang Archipelago moved from other northern islands in the Andaman Sea and settled in the area in the 1910s. Traditionally they had permanent houses on the beach strand but were nomadic in their food foraging practices, especially during the dry season. This long-term foraging trip is called *bagad* in the Urak Lawoi language.

TRADITIONAL WAY OF LIFE & KNOWLEDGE TRANSMISSION

A semi-nomadic food foraging lifestyle providing subsistence from the sea was the core of the Urak Lawoi's traditional culture. The transmission of traditional and local knowledge about marine life and the coastal environment took place as learners engaged in the daily activities of this subsistence lifestyle, where food was foraged and other necessities of life were produced locally from available material in the area. The traditional knowledge of the Urak Lawoi



Urak Lawoi children



is not knowledge-in-abstract, but rather knowledge-in-context. In particular it is knowledge generated, demonstrated and primarily transmitted in a context of active use. Mirroring Urak Lawoi social structures, traditional knowledge is accordingly transmitted through intra-household and intergenerational interactions and practices. Learning is first-hand and experiential.

FOR generations, traditional knowledge was transmitted from the elders to the younger generations when they travelled together, foraged for food and lived at various sites in the archipelago. In most cases, learning occurred as younger people observed and followed family or community members who were more experienced, closely observing their behaviour, and then tried to carry out the same activity by themselves. In addition, some knowledge transmission — still very much context and site specific — traditionally occurred through song recitations and story telling. Since the Urak Lawoi language does not have a written form, this form of knowledge transmission depends on oral tradition and direct participation. In all cases, those who were more experienced served as teachers, and distinctive situations and environments served as classrooms. Learning resulted in successful harvesting and improved living for both the learning individuals and the community. In short, success in acquiring traditional knowledge is synonymous with successful practice.

EXPERIENTIAL LEARNING THROUGH A SEMI-NOMADIC FORAGING LIFESTYLE

WITH their semi-nomadic, foraging lifestyle the Urak Lawoi utilised their mobility to make maximum use of the productivity of their natural ecosystems. Foraging made it possible for them to use a wide variety of resources at different sites and to subsist with no outside assistance. In the monsoon season fish were abundant near shore, and hook and line fishing and harvesting at low tide in the intertidal zone close to their permanent houses served sufficiently well as the main fishing methods. Learning, therefore, took place in their immediate environment. In the dry season, various types of food were less abundant at home than elsewhere in the archipelago. For several months, entire families went *bagad* at different places to forage. While men and elder boys focused on catching and fishing in the sea, women and children helped with gathering in the littoral zone at low tide and with such post-catch processes as cleaning, drying and salting.

BECAUSE foraging and fishing are dependent on natural circumstances, they require a vast store of local and situated knowledge to be successfully practiced.

Such knowledge can be best acquired by daily local practice and experience, with particular attention given to such changing environmental factors as weather, tidal conditions and the history of activities carried out in given locations. To successfully engage in their subsistence practices, Urak Lawoi fishers must have profound knowledge of both large scale geography and much smaller scale features, such as reefs, passes and currents that alter with tide and season. Regardless of scale, knowledge is acquired first-hand through a person's repeated presence at various places and their exposure to differing conditions. The transmission of traditional knowledge among the Urak Lawoi was thus very much environmentally cued and completely integrated into their overall way of life.

ALTHOUGH Urak Lawoi knowledge differs in its organisation from science, their sea travellers and fishers developed highly detailed and context-sensitive knowledge of tides, currents, lunar cycles, local wind and wave patterns, and their seasonal changes. With respect to the many kinds of marine life encountered by the Urak Lawoi, their use-based learning practices fostered detailed knowledge about the dispositions and habitats of local species and how best to utilise them in support of daily life. Traditional knowledge thus focused on various forms of marine life as parts of a larger overall pattern of relationships which include the Urak Lawoi themselves.

AS might be expected, traditionally much of the Urak Lawoi knowledge of marine and coastal resources was embodied knowledge — both literally and in the form of tools and technologies. Primary were fishing-and-gathering skills and specialised food-processing techniques. Diving was an important har-

vesting method to gather underwater sea life, such as molluscs and sea cucumbers. Knowledge of underwater geography and marine life, and skills to dive and move underwater, could only be acquired by intensively engaging in the activity. Such knowledge needed, in short, to be quite literally embodied by Urak Lawoi fishers and divers, often to quite a remarkable degree. For example, Urak Lawoi divers did not use any kind of equipment, except for a small pair of tailored goggles made of carved wood and glass. Without a breathing apparatus, they often dived down to 20 m to place and recover traps, and to collect shells and prized sea cucumbers. This diving ability of the Urak Lawoi is well-known. Kruahong (1998: 37) described their comfort with the sea by noting that ‘they walk and swim in the water like us on the land’.

IN sum, the epistemic practices of the Urak Lawoi tended to emphasise the conditional, the relational and the embodied rather than the strictly causal, the essential and intellectual or abstract. Put somewhat differently, the traditional knowledge of the Urak Lawoi was not objective knowledge possessed by knowing subjects in substantial isolation from what was known.

IT is possible that the non-objective, relational nature of Urak Lawoi ways of knowing factored in their lack of both a traditional concept of ‘nature’ and a traditional conservation ethic. As demonstrated in the subsistence practices centred on human–environment inter-relatedness, Urak Lawoi understanding of marine and coastal resources did not appeal to a sharp distinction between facts and values. As an example, despite the fact that coral reefs are highly valued among conservationists as a critical ecosystem that provides nursery grounds and habitats to many types of

marine life, the Urak Lawoi traditionally did not value the reefs and were not concerned about their condition as long as fish and other marine life they harvested were still available. Hence, the relatively modest ‘factual’ knowledge of corals transmitted among the Urak Lawoi can be seen as linked to their relatively modest direct valuation of corals in terms of their traditional subsistence practices, reflecting similarly modest concerns about the quality of their relationships to the reefs.

**SUSTAINABLE RESOURCE USE:
SUBSISTENCE ECONOMY &
NOMADIC FORAGING**

THE Urak Lawoi of the Adang Archipelago were able to use marine and coastal resources at a sustainable level even though a traditional conservation ethic did not exist among them. There were no concepts of sea tenure or taboo areas or taboo seasons for the harvesting of sea life. Most older Urak Lawoi strongly believe that marine and coastal resources cannot be depleted, and do not think that conservation is needed. The perceived lack of any need for conservation may be due largely to the fact that, historically, the impact of the subsistence practices of a small number of Urak Lawoi foraging in the large area of the archipelago was quite minor. The Urak Lawoi simply never faced severe scarcity of coastal and marine resources. In addition, their nomadic food foraging practices freed them from dependency on particular resources in a particular area. They could either change location in pursuit of similar resources or content themselves with other, less typically desirable resources, utilising their knowledge of a wide range of relevant local and regional conditions.

DESPITE the lack of a conservation ethic, however, Urak Lawoi practices of resource use were in fact consonant with sustaining local resources and the environment, because they were strongly tied to subsistence levels of production. For example, traditionally Urak Lawoi would harvest only the amount needed for short-term use and would not engage in any long-term storage, would harvest only sizable edible fish, and would share harvests among community members. By harvesting sizable edible fish, the juvenile fish of edible species have a chance to mature. Sharing harvests among community members helps support food security by reducing the need to catch large amounts in order to store food for future use. Sharing harvests among relatives and other people in need within the community is practiced even today. Those who go fishing do not mind sharing their harvest with those who do not go or who fail to catch anything on that day — a practice which factors into the small-scale realities of foregoing long-term storage of foodstuffs.

NOMADIC food foraging served to reduce the pressures of human exploitation on any particular area in the archipelago for a long period of time. The Urak Lawoi stayed at a *bagad* site as long as harvesting of food was conveniently available. When local resources were becoming scarce, they moved to a new place. Such a practice has been documented among other Urak Lawoi communities. Engelhardt (1989: 138), for example, has described a practice among the Urak Lawoi in Phuket that has the effect of maintaining the ecological balance of the intertidal zone. Urak Lawoi monitored the size and quantity of oysters gathered by depositing the empty shells in carefully stratified middens. When the daily take fell below the usual harvest, as shown by

a visual comparison of midden lenses, the Urak Lawoi interpreted this to mean that the carrying capacity of the oyster population had been exceeded and the band prepared to move to a new camp site. Having learnt to observe human pressure on natural resources, the Urak Lawoi took advantage of different spaces in the Adang Archipelago. The practice helped to prevent overexploitation of a particular resource at any given area by adjusting the time spent in any one place. At the same time, the resources had an opportunity to regenerate.

INTEGRATED KNOWLEDGE
SYSTEM DEPENDING ON
INDIVIDUALS & CONTEXT

IN the traditional culture of the Urak Lawoi, knowledge is embedded in different activities that are reinforced by one another. While geographical and physical environmental knowledge can be acquired through travelling and *bagad*, it is also embedded in place names, stories and songs. For example, in *rammana*² performances, the ceremonial songs tell of important places, sea travelling, physical features and animals in areas of the Adang Archipelago and the neighbouring seas. Such rehearsals of knowledge

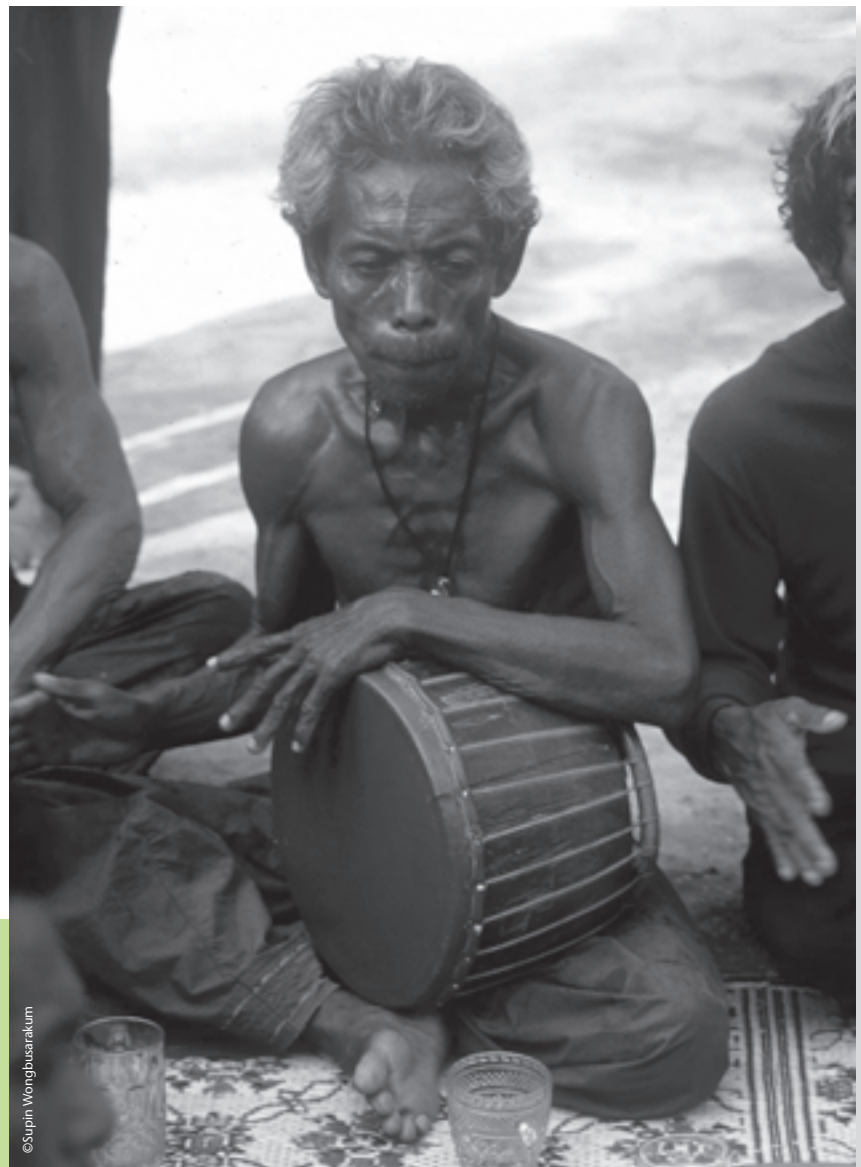
² *Rammana* music can be considered folk music. The style of the local *rammana* singing is call and response, in which a lead singer first sings and the rest of the group responds by repeating the same thing back. Musicians and singers use their memory, skills and talents to improvise harmonies. There is no practicing, rehearsal or singing of these songs outside a ceremony.

Village shaman performing
traditional *rammana*

can be seen as a functional mapping of the relational space of the archipelago.

IT is important to note, however, that among the Urak Lawoi not all traditional knowledge embedded in memorised oral traditions is available to everyone. Knowledge of a particular area or subject is often held only by certain individuals and not others. In the traditional Urak Lawoi way of transmitting certain knowledge, specific contexts are respected as the ap-

propriate setting for learning to take place. This has important implications for the conservation of the local indigenous knowledge. To return to the example of the *rammana*, the lead singer at present is the oldest shaman in the area and is the only person who knows all the words of the songs. The shaman does not believe in citing the songs or having them recorded because by doing so the original meaning of the performance will be taken out of its proper context.



©Supin Wongbuearakum

CHANGING WAY OF LIFE & LOSS OF TRADITIONAL KNOWLEDGE

DUE to the remoteness of the Adang Archipelago and the limited means of transportation to the mainland until quite recently, the main outside contacts of the Urak Lawoi were only a small number of *taukay*³ who arrived at the Adang Archipelago in the early 1950s. Commercial fishing, knowledge of modern fishing methods and related gear — including long-line net fishing, drive-in net fishing and dynamite fishing — were introduced by *taukay* and outside fishers to enable large catches in the area for their own commercial interests. Urak Lawoi took up these methods because the *taukay* made them available.

FURTHER outside influence came in 1959, when Ban Ko Adang School was founded on Lipe Island and a standardised Thai curriculum and formal classroom education for grades 1 to 4 were introduced. This contrasted markedly with Urak Lawoi experiential learning. According to the former educational administrator of Satun Province, the school was initiated by Praya Samanrataburin (Tongumuhamed), a governor of Satun from 1912 to 1932, who was concerned about the islanders' affiliation to Malaysia and wanted to cement Urak Lawoi ties to Thailand (Chaisak 1997). The school offered a standard Thai elementary curriculum

3 *Taukay* is a local term derived from a Taechiew Chinese dialect, which refers to a middleman. *Taukay* facilitated the exchange of goods, services and information between the Adang Archipelago and the mainland and helped with contact to outsiders. Today *taukay* trade boats and fishing tools for the labour, fishing skills and knowledge of the Urak Lawoi, are buyers of their harvests and offer credit in terms of cash and material necessities.

and also served to define the territory as part of Thailand. Estimates at the time of the school's foundation put the population of the archipelago at 50 to 60 Urak Lawoi households, with nearly 60 children of school age. For the following two decades, school was seen primarily as a place where children learned to speak, read and write Thai. The school expanded to junior high level in 1997. However, the founding of the school on Lipe Island hardly increased the number of outsiders, as for many years, there was only one teacher for all four grades.

IN 1974, the Adang Archipelago also became a part of Tarutao Marine National Park, and in 1988 the Fishery Department started a marine life conservation unit on Lipe Island. With official rules and regulations, Urak Lawoi semi-nomadic practices came to be legally restricted. Foraging for food all over the archipelago was considered a practice detrimental to natural resources and in conflict with the mandate of the national park. To minimise human impact on different islands, the park also relocated the majority of the Urak Lawoi to the island of Lipe, which was considered to be already degraded (Mahidol University 1974: 5). Certain aspects of sea life harvesting were forbidden, such as collecting giant clams and spearing turtles. Limited access by the park brought about a process of sedentarisation and effectively forced the Urak Lawoi to concentrate their resource use in specific areas.

TODAY, fishing remains the main occupation of the Urak Lawoi. However, since the advent of a tourism boom in the Adang Archipelago in 1998, tourism has become the second most important occupation and the most important source of cash income during the dry season, when harvests from fishing are generally lower than in the monsoon season. The number of tourist resorts increased from 5 in 1980 to 23 in 2005, and numbers of tourist bungalows increased from 153 to 496 over the same period. The number of local people, especially younger women and men, working seasonally in the sector is increasing.

SINCE the Urak Lawoi moved into the Adang Archipelago nearly a 100 years ago, there have therefore been different factors that have contributed to changing Urak Lawoi ways of life and its epistemic foundations. The following part of this paper describes the main factors that directly and indirectly affect the transmission of local and indigenous knowledge.

INVOLVEMENT IN MARKET ECONOMY THROUGH COMMERCIAL FISHERY

THE involvement of Urak Lawoi in a market economy through commercial fishing started as early as in the 1950s. Despite the fact that traditionally their relationship with the sea and their involvement in fishing were the main foci of their entire culture, it has



Urak Lawoi women in their free time

Drying fish on the beach



PARTICIPATION in a market economy has several effects on the knowledge of the coastal and marine life and its transmission among the Urak Lawoi. Urak Lawoi's use of marine and coastal resources in the Adang Archipelago is now based on what the *taukay* are interested in purchasing and the prices they are willing to offer. The traditional stress on a broad knowledge of different marine life and sea conditions is giving way to knowledge and methods more narrowly focused on that which benefits commercial fishing. Concentration on commercially viable fish, combined with a ban on hunting certain species in the park, has led to a reduction in the harvest of non-fish species. Younger fishers focus their learning activity on practices relevant to catching economically high-valued species. Fish that are brought

home for consumption are usually those that are low in price. Traditionally, people caught the amount they needed for their subsistence and the size of these fish was appropriate for their immediate needs. Now any size is caught as long as it can be sold and the catch size goes far beyond subsistence requirements. It was estimated in 1999 that the catch from trap fishing alone (which is commonly practiced near shore, in the rocky areas or coral reefs that cover about 25 km²) was at least 620 metric tonnes per year (Coastal Resources Institute 1999: 2.10).

TODAY cash income, credit and local shops are available. Travel to a market on the mainland has become much easier. Consequently, home production is greatly decreasing as manufactured goods replace home-made products.

become common for the primary purpose of today's catch to be its commercial sale. Today approximately 80 per cent of Urak Lawoi male household leaders fish for a living and 85 per cent of these people work for a *taukay*. In this arrangement, *taukay* have exclusive rights to the Urak Lawoi's catch at whatever price *taukay* decide to offer. The Urak Lawoi thus have a guaranteed buyer who takes their highly perishable catch without delay and arranges for further shipping of the commodity to the outside market. Local dependency on these outsiders is further increased as the boats and tools used by local fishers are typically purchased and owned by *taukay*, while previously the Urak Lawoi owned their own tools and boat.

LOCAL ways of fishing, including traditional methods such as hook and line and trap fishing, are accepted by the park since strictly enforcing a complete ban on harvesting would not allow the Urak Lawoi to meet their basic subsistence needs. However, while local fishing fleets use traditional methods such as hook and line and trap fishing, they are organised in an industrial manner in which the efficiency is high and the harvest is large. Outside fishing fleets are mostly purseiners⁴ and trawlers, which take advantage of lax enforcement of park rules to fish illegally in the area.

⁴ A purseiner is a type of fishing boat that uses a large net to surround and catch schools of fish. The large net is pulled together and closed at the end.

Most married women whose husbands earn a decent income, stay at home and have a great deal of free time. Many spend it on daily card playing. Only a few, usually unmarried teens or older women, may support themselves by working at a tourist resort.

DISCONTINUATION OF SEMI-NOMADIC FORAGING

As mentioned, much knowledge transmission previously occurred during nomadic foraging for foods in the dry season. Since the establishment of the 'National Marine Park', most of the area has become state property. While all Urak Lawoi had access to valuable resources for subsistence before the park status, the ban on nomadic foraging has resulted in a large-scale sedentarisation process in the area in which they were once (semi-) nomadic.

IMPORTANTLY, the discontinuation of a semi-nomadic lifestyle effectively eliminates opportunities for experiential learning among different household members. In the old days when *bagad* was common, family members travelled together to different sites. Knowledge was transmitted among them as a matter

of course and all members gained first-hand experiences of the local geography and related natural resources. Women and children also learned by being involved in harvesting and post-catch processes. Ironically, although *bagad* was instrumental in traditional Urak Lawoi learning processes relating to the natural environment, it was prohibited by governmental officials because it hindered children from going to school on a regular basis and receiving a 'proper education'. Now travelling and foraging at different sites in the archipelago has been discontinued. Women, children and elders concentrate their livelihood activities on the small island of Lipe. They are being exposed to only those types of marine life that are brought back home, which are mostly for food. Local knowledge has become increasingly restricted to only the people who still travel around, namely men employed by the fishery or tourism industries. Women, especially the younger ones, become ignorant of their local environment, resources in the archipelago and their uses. As the traditional knowledge of the surrounding geography and biology is becoming distant, most Urak Lawoi are not able to transmit local knowledge to their children as had been the case for prior generations.

INCREASE OF TECHNOLOGY

THE Urak Lawoi were once described as displaying great resourcefulness and ingenuity in sea-related activities. They were referred to as skilled and brave fishermen, with a great capacity for holding air in their lungs for long periods of time and diving to catch fish with their bare hands (Bangkok Post 1992; Ekachai 1991 in Eitel 1994). In the past, when technologies were limited, knowledge and skills were crucial to good harvesting and good living. It was necessary for the fishers to acquire a deeper knowledge of particular marine life, including the nature, habitat and contingent conditions that make for a better catch. With increasing technological access and use, Urak Lawoi have become more dependent on mediating tools and techniques and less reliant on their personal skills and knowledge. Modern technologies such as scuba, hoo-kahs⁵ and spear guns are supplied to Urak Lawoi fishers and are used to increase their harvesting efficiency. Traditional knowledge and skills are lost as younger fishers begin to fish with modern tools and techniques without having to train for the skills fishers needed in the past. Among the troubling consequences of increasingly widespread use of modern technologies is that it has become difficult for many fishers to think about catching certain species without modern tools. The basic practices of traditional Urak Lawoi ways of life are eroding.

⁵ Air supply from an on-board compressor through a hoist that connects to a regular diving mask.



©Supin Wongbusarakum

Long-tailed boats

BOATS used to be the most important material possession of the Urak Lawoi and the most important traditional ceremony and festival, *loi rua*,⁶ is still conducted twice a year. However, many boats are now owned by someone else, often a *taukay*. Modern boat technology allows for much shorter time spent travelling and less attention to natural circumstances, and for obvious reasons modern boats are now preferred. A long-tailed boat⁷ allows Urak Lawoi men to do a daily fishing trip at any point of the Adang Archipelago or to the mainland within a single day, instead of over several days as was previously the case. Staying overnight away from home during a fishing trip has become unnecessary and therefore there is no need for the women or family to accompany men. As an unintended consequence, opportunities to gain first-hand experiences during the trip are reduced and limited to men. Because boats are not built on site with local tools and knowledge, but are instead usually ordered for outright purchase from outside, the transmission of knowledge on building boats and homemade fishing tools is also dissolving both directly and indirectly. Today there are few men left with the skills of boat building.

⁶ *Loi rua*, literally meaning 'boat floating', festival takes place during the full moon of the 6th and 11th months of the lunar calendar. The Urak Lawoi use the occasion to pay respect to their ancestors and to symbolically float away their misfortune with a ceremonial small boat, which is constructed for this special purpose mainly out of the soft wood of the zalacca palm.

⁷ Ruohomäki (1999) has described long-tailed boats as follows: '... long, narrow canoe-like craft fitted with outboard motors. ... They are strong and simple to use and use diesel for operation. The engine has a long (4 to 5 m) steel rod attached to it with a propeller at the end. This steel rod can be lifted up easily and therefore the boat can be driven in shallow water if need be.'

FORMAL EDUCATION

FORMAL education has a direct impact on ways of learning among the Urak Lawoi children. For them, in addition to exposure to modern life through the media, schooling has become a primary instrument of cultural modification, and the school is the primary source of knowledge about the outside world. All teachers in the Adang Archipelago are outsiders and the textbooks or lessons are not modified to fit the local way of life. As Bodley (1982: 113–114) puts it: '...the years that children are required to spend studying the dominant culture's textbooks are in direct competition with the normal enculturation process.' The difference between what children are expected to learn in school and what they experience in their daily life can be illustrated by the results of an essay assignment for a Thai language class of sixth graders titled, 'Lipe in My Dream'. From the total number of twelve students, eight wished for a musical instrument, mainly the piano, and the same number a satellite dish. Seven students wished for an expansion of the school and the same number a computer. Such wishes seem more likely to come from urban students and seem quite unexpected from a rural island community where a central power system does not exist and running tap water was only available from 2006.

GENERALLY, Urak Lawoi parents see the school as a place where their children learn to read and write. Many parents do not see any need for education after the primary level and would rather have their boys work at sea. While the teachers complain about the Urak Lawoi children not being interested in studying and being poor at focusing in class, children themselves feel that they cannot do much with what they learn in school in their real-life situation.

ALTERNATIVE LIVELIHOOD IN TOURISM

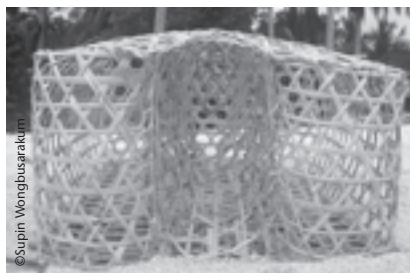
THE tourism industry offers a means of livelihood differing radically from the traditional subsistence way of life of the Urak Lawoi. From fishers and gatherers of sea life, the local people, especially younger women and men, are now holding hospitality and service related jobs. Most men drive a taxi boat offering snorkelling trips and excursions to other areas in the archipelago. For them the most frequently visited sites have come to reflect the interests of visitors. Sites once regularly frequented by the local people have become rarely visited despite faster means of present transportation. Women work at resorts and restaurants as maids, waitresses and cooks. Earning a living through tourism is largely limited to younger people who are more comfortable interacting with outsiders and more interested in learning some English to communicate. New skills and knowledge related to the tourism industry, such as language and hospitality skills, are being learned. Such knowledge does not exist among people in the older generations, except perhaps among outsiders. The feeling that the younger people cannot learn what they need for their present situation from the elders causes problems with generational gaps and disrespect for the elders.

WITH the recent violent incidents in the Muslim communities in South Thailand, including kidnapping, shootings, arson, bombing and governmental reprisals, and the tsunami on 26 December 2004, the number of tourists drastically dropped during the tourist season of 2005–6. This greatly reduced the earnings of most of the people who usually depend on the tourism sector for their income in the dry season. While the traditional knowledge and practices that

could help sustain the Urak Lawoi's culture, environment and livelihood are disappearing, the new knowledge and skills involved in tourism-based livelihood options have proved superficial, and the industries fostering these options have proven volatile and uncontrollable.

ENCOUNTERING & COUNTERING THE LOSS OF TRADITIONAL KNOWLEDGE

IN the rapidly changing situation in the Adang Archipelago, where modernisation, globalisation and technology are being introduced and integrated into Urak Lawoi society, the risk of traditional knowledge disappearing within the next generation is very real. Unless the traditional transmission of knowledge is augmented by additional methods, it will be difficult to maintain the depth and breadth of the indigenous knowledge needed to conserve the Urak Lawoi culture and promote the sustainable use of local biodiversity and natural resources. The last section of this paper proposes some of the methods of countering the loss of traditional knowledge that seem feasible in the Adang Archipelago.



Traditional trap made of bamboo

INTEGRATING TRADITIONAL KNOWLEDGE INTO LOCAL SCHOOL CURRICULUM

ONE way to facilitate the transmission of indigenous knowledge in the present context is by integrating locally relevant subjects into the curriculum. Since the school was founded in 1958 a standardised curriculum has been used that has little direct applicability in the local context. A locally appropriate curriculum should be developed. Among the important features of such a curriculum are accounts of local history and attention to traditional forms of cultural expression. Consideration should also be given to the relational and conditional nature of traditional Urak Lawoi learning and knowledge. For example, while a scientifically founded component about local ecology would be an important element in a locally relevant curriculum, this might be complemented by introducing traditional 'non-objective' approaches to conceiving the 'same' range of environmental systems.

IDEALLY, local community members would play a central role in both developing and implementing this curriculum. The best informants and teachers for traditional knowledge are undoubtedly the Urak Lawoi themselves. However, training and facilitation will need to take place in order to build the capacity of local people, so that they may become apt researchers and teachers of their own culture and environment in a present-day context, in which significant parts of the learning process no longer take place at first-hand in real-life situations. At the same time, any locally relevant curriculum needs to attach importance to informal education and experiential learning in which students learn from informal teachers, such as community elders

who have distinct local knowledge, or gain knowledge through first-hand experiences. Local guest speakers and fieldtrips should therefore be integrated into the curriculum. In this way, those who are not exposed to the local environment or are not involved in activities that allow for gaining local knowledge will, at a minimum, have exposure through organised educational activities and curricula in school.

ISSUES relating to the language of instruction must also be addressed, and ideally with significant sophistication. The current standard curriculum is not only delivered in Thai, it is structured by concepts and a cultural logic that are largely foreign to Urak Lawoi, who are only in the first generation of transition from a profoundly environmentally-situated way of life and learning. As much as possible, indigenous terminologies and socio-cultural structures should be carefully conserved in the school curriculum and attempts should be made to develop new practices for knowledge-seeking that are at once consonant with contemporary realities and respectful of traditional emphases on person and place specific knowing.

RECORDING KNOWLEDGE THROUGH WRITTEN LANGUAGE

BECAUSE the Urak Lawoi language is not a written language and knowledge transmission is dependent on person-to-person communication, learning comes from participating in an activity, observing and engaging with those who know. In the rapidly changing situation of the archipelago, traditional activities and ways of life are being discontinued. At the same time, the number of those who possess



Urak Lawoi men participating in recording former villages and *bagad* sites on maps (left)

Ceremonial boat building for the *Loi Rua* festival (below)

mainstream population. Even though their nomadism applied only to their foraging practices and was seasonal, they are often referred to as ‘sea gypsies’, a term that implies wandering without a home. The advantages of their nomadic food foraging are commonly not understood or accepted by sedentary people who see it as a ‘primitive’, unnecessary practice, and as a destructive — almost predatory — way of using resources. Their subsistence level of production is associated with an unproductive, backward, purposeless and lazy lifestyle.

CRUCIALLY, the low esteem in which Urak Lawoi are often held by mainstream populations is also being internalised. Alternative livelihood options and modern social institutions and aspirations bring in new

traditional knowledge is decreasing. This is, of course, not a phenomenon unique to the Urak Lawoi. Brock-Utne (2000: 153), who did her studies in Africa, cited Ki-Zerbo (1990) quoting Amadou Hampate Ba who rightly said: ‘When an elder dies in Africa, it is a library that burns.’ Unless the younger generation is interested in learning and there are opportunities to participate in those activities, there is a great risk of traditional knowledge being lost forever as those elders pass away. Given present realities of increasing integration into market economic activity and wage earning, the immediate prospects of the young seriously engaging with knowledgeable elders are likely to be limited.

AS a transition measure, one way to help perpetuate aspects of traditional knowledge is by publishing it in written form. The documented knowledge can be retrieved as the interest among present and future generations of Urak Lawoi grows and as they seek to share their traditions with interested outsiders.

BUILDING PRIDE IN TRADITIONAL CULTURE

THE Urak Lawoi have social and cultural characteristics distinct from the dominant Thai culture and modern society. However, with little knowledge of the Urak Lawoi’s cultural history and their semi-nomadic lifestyle, people often compare this ethnic minority to, and judge them against, the





Making a roof
from rattan and nipa palm

concepts that the Urak Lawoi did not have traditionally, which make them feel that they are backward or incomplete. Those who practice traditions seem to belong to an older, and for some increasingly obsolete, generation. Many young Urak Lawoi see their indigenous traditions as backward, and few treasure their heritage and culture. Without a strong, countervailing voice representing the people and their culture, the Urak Lawoi have become the group most vulnerable to disruptive changes in the Adang Archipelago. And yet, a self-conscious awareness that parts of their culture might be irrevocably lost if they accept modern development does not seem to have developed.

IN reality, the Urak Lawoi possess a significant body of knowledge and skills that others do not have. These include their profound knowledge of the local environment and marine life; their skills in harvesting sea life, diving and boating; and their ability to live in a sustainable way through their traditional semi-nomadic lifestyle. Their unique indigenous knowledge and culture contribute to the richness of global cultural diversity and should be recognised. As the number of visitors increases in the area, there is a growing interest in the traditional culture and traditions of the Urak Lawoi. Outsiders' interest in their culture could provide a starting point for the younger generation themselves to revisit its value and become interested in traditional learning. As a young Karen man in an eco-tourism community in North Thailand said, 'If people come so far to listen to my grandfather, then I need to find out what he knows.'

FINAL REMARKS

ADDRESSING this internalisation of negative esteem is a considerably sensitive issue. Grave dangers attend encouraging Urak Lawoi to conserve their traditions and resist what appears to be a more progressive and potentially comfortable way of life and, by some measures, a higher standard of living. Yet at present the Urak Lawoi are not well enough aware of the full pattern of interdependencies to which they open themselves with integration into contemporary patterns of globalisation, and this prevents them from thoroughly evaluating the resulting outcomes and opportunities. The imperative is to create conditions under which such a thorough evaluation is possible, and this includes — for the moment — introducing measures to conserve local indigenous knowledge and, because of its highly context- and use-specific nature, its traditional means of transmission.

THE suggestion that indigenous and local knowledge might be preserved by integrating them into the local school curriculum and by recording them in the form of written documents could be considered contradictory to traditional Urak Lawoi ways of experiential learning in and from real-life contexts. However, these approaches to preservation are ways of counteracting the loss of such knowledge and making it possible for the Urak Lawoi themselves to retrieve and adaptively conserve their own knowledge and cultural traditions in the future. Experiences from other traditional cultures, including those of indigenous Hawaiians and Maoris, have delivered a strong message that objectively preserved traditional cultures can be revived. It is therefore crucially important for indigenous knowledge to be retrievable in one form or another and not lost altogether.

AT present, the provincial Government of Satun and the management of Tarutao National Marine Park recognise the fact that the Urak Lawoi are different from the Thais and have their own distinctive

way of life. However, their unique culture and way of life have been largely reduced to an asset for the tourism industry. The park management has not included Urak Lawoi in decision making processes, and there has been no open acknowledgement of the value of their unique culture from those whom the Urak Lawoi consider influential, such as governmental officials. To give the transmission of traditional knowledge a chance and to allow pride in traditional culture to be established and deepened, it is crucial that an array of interrelated efforts are institutionalised as rapidly as possible and are maintained long-term. Whether these efforts are initiated by the national government, NGOs or international organisations that support the conservation of traditional knowledge systems, they will only prove effective if they are truly sustainable and if the Urak Lawoi themselves increasingly participate in them. Ultimately, countering the loss of traditional Urak Lawoi knowledge and culture depends on the degree to which the Urak Lawoi, through new partnerships and relationships, are able to value their own distinctiveness.

REFERENCES (T: IN THAI)

Bodley, J.H. 1982. *Victims of Progress*. Melo Park, California, The Benjamin/Cummings Publishing Company, Inc.

Brock-Utne, 2000. Transforming African Universities Using Indigenous Perspectives and Local Experience. In Teasdale G.R. and Ma. Rhea, Wane (eds.), *Local Knowledge and Wisdom in Higher Education*. Oxford, Elsevier Science.

Chaisak, W. *Personal communication* 19 December 1997. (T)

Coastal Resources Institute. 1999. *An Appropriate Model for Tourism Development of Tarutao Marine National Park*. (T)

Eitel, M. 1994. *Chao Le of Ko Tarutao National Park: Myths, Identity, and Lifestyles amongst Battlefields and Nesting Grounds*. Chiang Mai, CYIT Program – Chiang Mai University.

Engelhardt, R.A., Jr. 1989. Forest-Gatherers and Strand-Loopers: Econiche Specialization in Thailand. *Culture and Environment: A Symposium of the Siam Society*. Bangkok, D.K. Printing House. Pp. 125–141.

Kruahong, P. 1998. *Water People (Sea People) in Thailand*. Bangkok, Bannakit Trading. (T)

Mahidol University, Project on Education and Research on Environment. 1974. *Report of Preliminary Survey of Tarutao National Marine Park*. (T)

Phongsuwan, N. and Changsang, H. 1987. Coral Reef Resources of the Tarutao National Park, Thailand. In Soedharma, D., Purwanto P., Santoso, R. and Sitompul, D.M. (eds.), *Proceedings of the Symposium on Coral Reef Management in Southeast Asia*. Bogor, SEAMEO BIOTROP. Pp. 141–155.

Phuket Marine Biological Center. 1998. *Coral Reef Resources Study*.

Ruohomäki, O. 1999. *Fishermen No More? Livelihood and Environment in Southern Thai Maritime Villages*. Bangkok, White Lotus Press.

Lipe Island in the Adang archipelago





**TRANSMITTING INDIGENOUS KNOWLEDGE THROUGH THE SCHOOL
CURRICULUM IN A DIMINISHING BIO-CULTURAL ENVIRONMENT:
THE CASE OF BOTSWANA**

HERMAN M. BATIBO

INTRODUCTION

IN most traditional African societies, children acquired their indigenous knowledge through constant interaction with both the adult world and the physical environment around them. This knowledge included an understanding of the local ecological system, the acquisition of skills in the use of the various tools and devices of their daily activities, familiarisation with the customs and practices of the relevant society, an understanding of societal values and beliefs, and the formation of a worldview that reflected the experiences of the society in which they lived. Thus, through constant interaction with the adult members of society and their physical milieu, children were able to progressively master not only the structural aspects of their languages, but also the rich vocabulary which reflected their society's knowledge of its physical world, cultural experiences and practices, and its conceptualisation of the universe. In this way, traditional knowledge was constantly accumulated and constantly transmitted from one generation to the next.

THE REDUCED HOME-BASED TRANSMISSION OF INDIGENOUS KNOWLEDGE

HOWEVER, in recent years this traditional mode of transmitting linguistic, cultural and nature-based knowledge has been grossly impacted by a reduction in bio-cultural diversity, that is to say a reduction in the diversity of biological and cultural phenomena and decreased interaction between both. The adoption of a Western-based lifestyle, including modern health care, classroom-based education and the use

of Western technology, has disrupted and diminished cultural diversity in most African countries. Meanwhile, the African continent is experiencing a dramatic reduction of its ecological diversity due to a number of factors, such as deforestation of the equatorial forests for timber and pulp, clearing of woodlands for cultivation and firewood, overgrazing of the rich savannah lands, uncontrolled hunting of wildlife and the pollution of water places. As a result, Africa is now experiencing critical desertification, scarcity of clean water, hostile climatic conditions such as continuing droughts, and the disappearance of certain species such as the white rhino and elephant (Batibo 2001a: 313).

MOREOVER, there is presently reduced contact between nature and children, even in their home environment, due to new trends in the lifestyles of most African societies. There is a growing number of children attending school, with most starting at the age of six or seven.¹ They then spend most of their time at school or in carrying out activities relating to their school life and therefore have little contact with nature, as they do not participate in traditional activities like hunting, gathering or herding. Also, they no longer participate in cultural practices relating to nature, such as cattle herding, fruit gathering, game hunting, animal tracking, bird trapping, or food preservation. At the same time, many societies have developed negative attitudes towards traditional life as they consider it backward or not in line with the future expectations of children in the modern world.

¹ In fact, in places where there are pre-schools, children start school as early as the age of three. In such cases, they have even less time to interact with their home-based environment.

AS a result of the diminished contact with nature and the traditional cultural environment, younger generations are rapidly losing their knowledge of the ecosystem, such as the names of plants and wild animals, and their characteristics or uses. At the same time, they are losing interest in their culture and traditions.

EFFORTS TO TRANSMIT INDIGENOUS KNOWLEDGE IN BOTSWANA

THE effect of reduced bio-cultural diversity and the adoption of new lifestyles, with new languages and socio-economic set-ups, has had a devastating impact on the acquisition of the ethnic languages and relevant bio-cultural knowledge in many African societies.

IN the case of Botswana, formal education is provided through the medium of Setswana, the widely used lingua franca and national language, at the lower primary school level, and in English, the official language, at the upper primary school level and above. No official role is accorded to the remaining twenty-six languages of the country. The official school curriculum is basically oriented towards the promotion of modern education based on Western and mainly Christian values. The main goals of modern education are not to impart traditional or cultural values and skills to enable children to be active participants in their communities, but rather to prepare the young Botswana people 'for the transition from a traditional agro-based economy to the industrial economy that the country aspires to' (Government of Botswana 1994: 5). Thus, at present the country's educational philosophy is to convert the people of Botswana into a major

human resource, through education and training, so that they might be effective instruments of national development, while simultaneously integrating them into the moral and social values of development. In the current educational system, no efforts have been made to link traditional knowledge to the school curriculum or to incorporate indigenous knowledge into the school system. It is usually left to the teachers' own initiative to familiarise the students with some traditional concepts and objects. Since most of the teachers come from the mainstream Setswana groups, this cultural information tends to reflect the worldview of the mainstream group, namely the Tswana. This would include the erection of a traditional hut in the school compound, the collection and storage of traditional artifacts in mini school museums, visits to national museums, the formation of traditional dancing troupes and the display of culture-based performances.

ALTHOUGH there is a remarkable reduction in the traditional transmission of indigenous knowledge systems, Botswana (and presumably other countries of Africa) has failed not only to appreciate the importance of linking indigenous knowledge to the school curriculum but also to involve the relevant ethnic groups in the promotion of indigenous knowledge (Bernard Van Leer Foundation 1998, Gunestad 2004). Among the main reasons, one may mention the fear of promoting ethnic divisions (as each group is presumed to have its own worldview) and the quest to promote a mono-lingual and mono-cultural nation as a way of fostering unity and national identity. Thus an integrative rather than preservative policy is adopted (Batibo 2001b: 130). In Botswana there is a progressive cultural policy, put in place in 2001, which explicitly

mentions the preservation and transmission of indigenous knowledge, and states, among other things, that 'education in every society is an institutionalised means of enculturation of cultural continuity' and that to strengthen the learning process there must be strong 'collaboration between teachers and parents in the development of the child' (MLHA 2001: 10–11). However, the Department of Culture in the country, just like most other countries in Africa, does not belong to the same ministry as the Ministry of Education. In Botswana, 'culture' is overseen by the Ministry of Youth, Sports and Culture. This means that cultural policy cannot easily permeate into the practices of the Ministry of Education.

PROMOTING INDIGENOUS KNOWLEDGE IN BOTSWANA: THE BOKAMOSO PROJECT

THE ORIGIN OF THE BOKAMOSO PROJECT

THE efforts of some researchers and non-governmental organisations to safeguard the transmission of indigenous knowledge, particularly that of traditionally marginalised peoples, are clearly visible in Botswana. These efforts are most visible in a number of NGO-run centres in the country. One of the most conspicuous success stories in the country is a curriculum and programme for in-service teachers who are involved in pre-school education, which was designed and run with the involvement of traditional local communities. This programme, known as Bokamoso, has been established since 1988 and is carried out at the Kuru Development Trust Centre, in western Botswana. The aim of the programme is to provide in-service

training for individuals from the San² and other minority communities who are involved in teaching in pre-schools in the remote areas of the country.

THE Bokamoso Project started in response to the need to link local or indigenous knowledge with the Western-based education provided in the school system. The Government of Botswana had long recognised the sharp contrast between home and the school among the minority or marginalised groups living in the remote parts of the country. At home children used their own ethnic language, in a specific cultural setting and physical environment, and made use of local or indigenous knowledge. Meanwhile, at school the children had to use Setswana, the national language and lingua franca, and were oriented towards a Western-based lifestyle. This caused a sharp disorientation, loss of self-confidence, considerable stress and homesickness. This situation was made worse by bullying of the minority students, particularly the San, by the mainstream speakers. As a result many minority students abandoned school and returned home. One can cite, as an example, Monyemane Primary School in Kang Village, in the western part of Botswana. According to Letsholo (2001), about one half of the children of San origin drop out from this school every year, for multiple reasons, which include exposure to an alien language and culture, bullying and abuse by other students, lack of support or prejudice from the teachers, loneliness, pregnancy and unfamiliar food, clothing and environment. This tended to defeat the primary

² The San are also known as Bushmen, and they are the original inhabitants of Southern Africa. Other names used to refer to these people include the word Basarwa, as used by the Botswana people, and the term Khoesan or Khoisan, as commonly used by linguists.

aim of the government which was to integrate the children into the main-stream language and culture. Hence although pre-schools were meant to act as a bridge between home and the formal primary school system for the children, they failed to play this role.

THUS, with the help of the non-governmental organisations and community support, a number of new pre-schools were set up in areas occupied by mainly marginalised groups. The establishment of pre-schools for the remote area dweller (RAD) locations and farms³ has become an important preoccupation of NGO groups. The government has also played a supportive role by supervising and providing material support through funds provided mainly by the district councils and the drought relief bodies (Matenge and Motshabi 2001).

The number of these pre-schools has swollen since the late 1980s, to reach thirty-four in 2004. Most of these pre-schools are located in the Kgalagadi and Ghanzi districts (in the far western parts of the country, see Table 1). However, before the Bokamoso Project came into existence, these pre-schools were similarly based on modern structures and existing school policies, with Setswana as the medium of instruction. They consequently suffered from similar problems with student drop-outs. However, the Bokamoso Project has helped to re-orient the approaches of teaching and has created a more conducive environment in the pre-schools, thus helping to give children more confidence and had a solid cultural base. Such an educational orientation would make it possible to fulfil the government's desire to integrate the San children into mainstream Setswana society.

THE Bokamoso Project provides teacher trainees with a system of educational tools and practices that build on the local or indigenous knowledge that they will encounter in the pre-schools in which they will teach. The rural children's pre-school knowledge is usually home-based, nature oriented and focused on the ethnic group's cultural experiences and unique worldview. Such backgrounds have to be systematically infused into the formal, school-based, Western oriented education (Hays 2002).

THE curriculum of the Bokamoso Teacher Training Centre was developed over two years by a special team made up of not only curriculum experts but also parents, community members and members of NGO groups. The curriculum development operation, which was sponsored by the Van Leer Foundations,

TABLE 1

Pre-school location	Type	Enrolment	Age range	Fee	Funding
D'kar	VDC	18	3-5	P10	Farm +S & CD
Eaton Farm	Farm	12	3-6	P10	RADP
Kempf Farm	Farm	10	3-6	P10	RADP
Hukuntsi Day Centre	Council	79	2.5-6	P20	Council
Tshane Day Centre	VDC	20	3-6	P20	S & CD
Monong	NGO	13	2.5-6	P20	RADP
Kacgae	Council	38	2.5-6	P20	Council
Maake	NGO	25	3-5.5	P20	RADP
West Hana Hai	VDC	26	3-6	P10	S & CD
Ncaang	NGO	14	3-6	P10	RADP
Lokgwabe	VDC	18	3-6	P20	S & CD

A sample of the pre-schools located in the Kgalagadi and Ghanzi districts of western Botswana (based on Matenge and Motshabi 2001). 'VDC' stands for Village Development Committee. Such committees usually deal with the social and economic issues of their respective villages. 'S' and 'CD' stands for Social and Community Development. This is a government department responsible for the social welfare of the people in the rural areas. 'RADP' stands for Remote Areas Dwellers Programme. It is a programme which aims at development for people living in remote rural areas. Most of such people are of San origin.

³ These are predominantly commercial farms in which pre-schools have been mainly established for the labourers' children.

was based on the philosophy that early learning is most effective if it is based on the child's home environment and if parents and communities are actively involved not only in curriculum development but also in running the programme (Bernard Van Leer Foundation 1998; Bokamoso Team 2000: 7). The core elements of the Bokamoso Training Programme are therefore:

- 1 a two-year programme for the in-service training of mother tongue speakers who are selected by the communities as pre-school teachers;
- 2 a mother tongue pre-school curriculum, built around familiar themes, which utilises locally available resources to lay the foundation for the formal primary learning environment;
- 3 an extension of the training to parents and community educators so that communities who have no access to educational facilities will be able to prepare their children for formal education. This extension can function as an empowerment tool for the community to build self-esteem;
- 4 pre-school enrolment which coincides with the government's classification of age-groups for the formal primary school system. Bokamoso deals with children aged between three and six years. Usually children start formal primary education at the age of seven; and,
- 5 a series of theme books which have been developed to guide future teachers. The books contain themes which are based on the local and indigenous knowledge and



Donkey-drawn carts as the most common traditional means of transport in the remote areas of Botswana (Source: Bokamoso Educational Training Centre 1996:7) Reproduced by permission

traditional skills of the marginalised communities, such as medicinal herbs, hunting skills, plant names and tracking techniques.

THE use of mother languages in the pre-school system has been very important as it allows children to learn and express themselves in a language in which they have the most confidence and which is the basis of their cognitive and emotional development. However, these children also learn Setswana, which is the national language and the usual medium of instruction in the formal primary school system (Keakopa and Qubi 1994). The gradual passage from mother tongue education to bilingual education before speaking Setswana in the primary school system has ensured an effective and sustained learning process (Genessee 1987).

THE teachers are trained to use theme books based on familiar environments and culture. The themes include veldt food, animals, seasons, plants, means of transport, singing, dancing, costumes, drawings and rock art. The teachers are expected to use or teach these themes when introducing any Western-based concepts. For example, before talking about motor vehicles or aeroplanes, the

teacher will start with walking or running as a primary means of transport, then donkey or donkey drawn carts, as these are the common means of transport in remote rural areas (Hays 2002).

EQUALLY, when talking about concepts like refrigeration, the teachers could discuss traditional ways of preserving food such as drying, smoking, roasting or soaking. Moreover, since the San child's background is mainly nature-based, the Bokamoso Project has prepared a theme book on seasons, as they are conceived in the San communities. The book, entitled *Seasons* (produced in 1998), describes the various climatic changes during the four seasons of the year and how these climatic changes have a bearing on trees, animal behaviour and human activities. Thus, summer is described in terms of falling rain, hot weather, presence of thunder storms, long daylight, blossoming plants, leafy and shady trees, ripening of fruits on trees, animal fattening and reproduction, nest building by birds to lay eggs, the gathering of veldt food and the wearing of light wraps around one's waist. Meanwhile, winter would be described in terms of short daylight, cold weather, the shedding of tree leaves, the hibernation of some animals, the migration of birds to

warmer places, the final harvesting of crops, the wearing of warm wraps, the use of fire places and the telling of stories by grandparents. Such child-centred, nature-based descriptions would not only create a child friendly atmosphere, but would also provide a sound base for the child, as it prepares him/her to understand how climatic conditions have a bearing on human behaviour and the way people deal with their daily lives.

ON the other hand, given that music and dancing are important forms of entertainment and cultural preservation among the San, the Bokamoso Project has included an important section in the programme on songs, music and dance. The musical performances include singing and humming while dancing. Such performances may also include poetic recitals and listening to sounds of nature, such as the whistling of the wind, the falling of the rain, noisy thunder storms or the singing of birds. The programme aims to use these nature-based sounds to develop the children's musical and rhythmic skills. They act also as a means of entertainment and preservation of cultural practices. The programme encourages the use of traditional musical instruments as a way of relating the child to his/her home and cultural background. Moreover, the teachers are encouraged to use low-cost sustainable materials obtained from local sources. Thus traditional pots, calabashes and horns are used instead of Western-manufactured containers.

SUCCESS OF THE BOKAMOSO PROJECT

THE Bokamoso Project has displayed clear success as it has helped to re-orient the approaches of teaching and has created a more conducive environment in

the pre-schools. As a result, the children attending these schools have developed more interest and confidence, as what they learn is related to their home environment. Also they have become more at ease with the school environment as they see that the teachers use their language, understand their customs and are familiar with their worldview (Batibo 2001). Thus, drop-outs have lessened and the children are now able to sustain their education up to higher levels. At present, the average enrolment ranges between ten and eighty in a school, with the average around twenty-five children.

ON the other hand, the earlier integrative or assimilative approach that was advocated by the government was counter-productive, in spite of the intentions of the government to promote equality and unity in the school system. The Bokamoso approach aims to provide a link or bridge in which the disadvantaged child maintains his/her identity and preserves his/her culture and worldview, while progressively understanding the mainstream language, culture and Western-based school environment.

MOREOVER, the gradual passage from indigenous knowledge to mainstream or Western-based knowledge, along with the change of language from mother-tongue to Setswana, has been crucial in meeting the expectations of the communities. These would like their children to preserve their identity through knowledge of their own culture and practices, but at the same time be part of the wider world and even benefit from modern opportunities through knowledge of mainstream culture and language. In fact, the involvement of minority communities in the preparation of the pre-school curriculum and the running of school affairs has further given parents

Singing, dancing and musical instruments among the San
(Source: Bokamoso Educational Training Centre 1998:66)
Reproduced by permission



confidence, as they feel empowered and valued in the important matter of their children's education.

HOWEVER, the success of the Bokamoso Project and the pre-school system in general may be short-lived in the long run if the government does not become more involved financially and logistically. At the moment, most financial support comes from NGO groups and various community funds. Such sources of funding cannot be expected to be permanent.

CONCLUSION

GENERALLY speaking, most African school systems would like to incorporate cultural features in the school curriculum, and even to instil a smooth transition between the home and the school. However, in most cases, the focus in the school curriculum is mainly on mainstream languages and cultures. Only rudiments of the artistic expressions of the other groups may figure in some isolated activities like traditional dances, singing and art. The children of minority, and often marginalised, groups therefore tend to be grossly disadvantaged. Even where

there is a progressive cultural policy in a country, ideals of such policies rarely percolate into the educational system as matters of culture are often part of a completely different ministry. Thus, the ideals of the cultural policy are not given much attention in educational circles.

ON the other hand, the rapid erosion of traditional cultural practices and norms, coupled with linguistic losses and the reduction of biological diversity, means that the child's home environment is continuously impoverished and that his/her world is oriented increasingly towards a Western-based or global village perception.

THE Bokamoso experience has shown that a proper transition between the home and the school, and linking home-based indigenous knowledge to school-based Western education, are the best

ways of creating confidence and interest in marginalised children. Through the activities of the pre-schools in western Botswana, many young minority speakers, especially those from the San groups, are now able to build a good foundation and therefore continue steadily in the school hierarchy. One of the fundamental principles of this programme has been the use of mother-tongue based pre-school education that concentrates on relating new information to the children within a familiar cultural and worldview context. It has also focused on involving the relevant parents and the community as much as possible and incorporating traditional learning and cultural knowledge into a classroom environment. Due to the success of the programme, participants now come from all over Botswana, particularly from traditionally marginalised groups, including both San and non-San.⁴

IT is, however, unfortunate that the government's support in this endeavour, particularly where the curriculum has been home-based, has been very minimal. The main reason is that the government supports an integrative policy in which the concepts of equality and human rights are interpreted as the right of the minority or marginalised groups to have the same treatment and access to resources as the mainstream groups. In fact, just as our governments are concerned about topical issues, such as the HIV/AIDS pandemic, gender imbalances and environmental conservation, they should also be concerned about the safeguarding and transmission of indigenous and local knowledge, particularly that of marginalised groups, especially where such knowledge would enhance a child's learning process.

⁴ The programme has attracted interest and admiration in southern Africa and also in the other parts of Africa and beyond.

REFERENCES

- Anonymous** 1994. *Listen to us: Challenges facing San children in education*. A Report compiled for the working group on indigenous minorities of Southern Africa (WIMSA)
- Batibo**, Herman M. 2001a. 'The endangered languages of African: A case study from Botswana'. In Luisa Maffi (ed). *On Bio-cultural Diversity: Linking Language Knowledge and the Environment*. Washington: Smithsonian Institution Press
- Batibo**, Herman M. 2001b. 'The empowerment of the minority languages for education and development'. In Richard Trewby and Sandra Fitchat (eds). *Language and Development in Southern Africa: Making the Right Choices*. Windhoek: Gamsberg Macmillan
- Bernard** Van Leer Foundation. 1998. *Building on People's Strengths: Early Childhood in Africa*. The Hague: Albani.
- Bokamoso** Educational Training Centre. 1996. *Our Donkey-Cart and Other Kinds of Transport*. D'Kar, Ghanzi: Kuru Development Trust.
- Bokamoso** Educational Training Centre. 1998. *Seasons*. D'Kar, Ghanzi: Kuru Development Trust.
- Bokamoso** Educational Training Centre, D'kar, 2000. *Teacher Training Curriculum for Early Childhood Educators*. D'Kar, Ghanzi: Kuru Development Trust.
- Genesee**, Fred. 1987. *Learning through two languages: Studies of immersion and Bilingual Education*. Cambridge: Newburg House Publishers.
- Government** of Botswana. 1994. *The Revised National Policy on Education*. Gaborone: Government Printers
- Gunnestad**, Arve (ed). 2004. *The role of Culture in Early Childhood Education*. Report from the 6th Network Conference held in D'kar, Ghanzi in Botswana from 31st May to 4th June 2004. D'kar, Kudu Development Trust.
- Hays**, Jennifer, 2002. 'Education and the San of Southern Africa: The Search for Alternatives'. In I.N. Mazonde (ed).
- Minorities in the Millennium: Perspectives from Botswana*. Gaborone: Printing and Publishing Botswana Ltd.
- Keakopa**, M. and X. Qubi. 1994. *Parents as Partners*. Report on the Workshop on parent (Involvement in Early Childhood Education. D'kar, Ghanzi: Kuru Development Trust.
- Le Roux**, Willemien. 2000. *Torn Apart*. D'kar: Kuru Development Trust.
- Letsholo**, D. 2001. *Patterns of Language Shift and Maintenance among the /hasi Khoesan Speakers of Monyemane Ward in Kang Village*. BA Dissertation, University of Botswana.
- Matenge**, Brigid and Kgosi Motshabi. 2001. *A study of Pre-school Education in the RADS and Farms in Botswana*. A Report for the Ministry of Education and the Botswana Educational Research Association. Gaborone, Ministry of Education
- MLHA**. 2001. *National Policy on Culture*. Ministry of Labour and Home Affairs: Department of Culture and Youth. Gaborone: Government Printers.



LEARNING AND INUIT KNOWLEDGE IN NUNAVUT, CANADA

PETER BATES

INTRODUCTION

IN this paper I will explore efforts to preserve Inuit knowledge in Nunavut, Arctic Canada. Current efforts to safeguard the transmission of Inuit knowledge tend to be focused on efforts to generate books, maps and CDs, and to incorporate Inuit knowledge into school curricula. I will suggest that these efforts to preserve Inuit knowledge, while undeniably important, are founded on Western assumptions about the transmission of knowledge. Consequently these methods may overlook the very thing that many Inuit believe gives this knowledge its strength and vitality: its experiential connection to the land and animals. I will argue that attention to this sphere of experience and learning is essential in order for the information taught in the classroom, or stored in books, maps and CDs, to be placed in context. Encouraging and facilitating experiential contact with the land should therefore be a central aspect of any efforts to transmit or preserve Inuit knowledge. I will further suggest that attention to this sphere of learning can not only compliment, but also transcend, attempts to address issues of linguistic and cultural change.

ETHNOGRAPHIC CONTEXT

THE observations for this paper were made during fifteen months of ethnographic fieldwork in the Inuit community of Cambridge Bay, in Nunavut, Canada, between July 2003 and November 2004. This arctic community is located on the south coast of Victoria Island, which is separated from the Canadian mainland by narrow straits which freeze over for nine

months of the year, allowing skidoo access to the mainland. Cambridge Bay is a community of roughly 1300 individuals, 80 per cent of whom are Inuit, while the remaining 20 per cent are predominantly Euro-Canadians. Previously the Inuit in the community were nomadic hunter-gatherers living in small scattered groups in the surrounding area. These groups came together during the 1950s and 1960s to form the community of Cambridge Bay (Collignon 1993: 71–75; Damas 2002: 40–49, 72–73, 112–122, 160–163; Freeman 1976: 46–48). The community is now the administrative centre of the Kitikmeot region, and boasts numerous government buildings, two schools, an Arctic College campus, two food stores, a bank, an ice skating rink and a seasonal indoor swimming pool. All homes have running water and electricity. Despite these amenities, hunting and travelling on the land remain important aspects of Inuit identity, and caribou, muskoxen, Arctic char, wolves, bears, wolverines, seals, waterfowl and ptarmigan are all regularly harvested by the community, depending on seasonal variations in their numbers.

KNOWLEDGE LOSS

MANY older Inuit hunt and travel frequently. However, the move from the land into the community, and the ready availability of store bought foods and clothing, has meant that many Inuit today, particularly the young, are spending less time out on the land engaged in hunting practices than their grandparents (Condon et al. 1995). The government's welfare policy has also destroyed incentives for Inuit to hunt for their food (Nelson 1969: 386; Brody 1975: 166–186; Condon et al. 1995), encouraging a sedentary lifestyle with neither wage earning nor hunting taking place. Condon et al. (1995), working in Holman in the early 1990s, suggest that many Inuit youth may not have even seen a caribou, much less shot one. I similarly met eighteen-year-old Inuit youths in Cambridge Bay who had recently seen their first Arctic Fox, despite these animals being a common sight within a hundred yards of the community. I also went out on the land with family groups in which youths had no



Sea ice melting in the spring on the coast of Victoria Island

©Peter Bates

knowledge of how to set fish nets or skin caribou, despite their families regularly engaging in these activities.

FURTHERMORE, within Cambridge Bay there is little evidence today that young people receive much guidance from the elders of the community. Differences in aspirations and outlook make the generations rather inaccessible to each other, a process that perhaps started with the formal schooling of Inuit youth many decades ago (Brody 1975; Balikci 1970: xxiv; Nelson 1969: 385). Language shift has greatly exacerbated this problem. In Cambridge Bay older people speak fluent Inuinnaqtun, the local dialect of Inuktitut, and little or no English. Meanwhile, those of middle age may have a good grasp of Inuinnaqtun despite using English as a first language. Most young people, however, speak only a handful of Inuinnaqtun words. The language is not used in everyday conversation, and little effort seems to be made on either side to communicate between generations. In the overcrowded houses of Cambridge Bay, in which several generations may live side-by-side, there is consequently a noticeable silence between the elders and their grandchildren. It seems likely that the decline in language will continue, especially as most fluent speakers of Inuinnaqtun are reaching old age.

THIS reduced contact with the land and animals, the limited communication currently seen between generations of Inuit, and the breakdown of Inuinnaqtun itself, is thought to pose a severe threat to the continuity of Inuit knowledge (e.g. Thorpe 1997). In Nunavut a flurry of activity currently surrounds efforts to preserve this knowledge, most often focusing on the elders of the communities, who are

seen to be the last bastions of true Inuit culture (Rigby et al. 2000: 104). Elders are interviewed frequently, and their knowledge documented. The physical products of these efforts are highly visible around the town. Books, pamphlets, posters, maps, CDs and DVDs can be found in government offices, the library, the heritage society, the visitor centre and the two schools. An Innuinaqtun dictionary has been developed, and language and translating courses are offered at the Arctic College campus located in Cambridge Bay. The Nunavut schools curriculum has also come to be seen as a crucial tool in the preservation of Inuit knowledge, and the aim is for curricula to be devised so that many of the lessons incorporate aspects of Inuit knowledge and culture. Innuinaqtun lessons are also a part of the education programme in Cambridge Bay's schools. A wealth of endeavours therefore attempt to ensure that Inuit knowledge is preserved within the community.

WAYS OF LEARNING

CURRENT efforts to preserve and transmit Inuit knowledge, through the approaches described above, seem to be rooted in the didactic educational models, which dominate Western teaching processes (Lave 1990; Pálsson 1994: 902–903). These processes presume that knowledge consists of a collection of discrete items of information, which can be extracted from both their local context and the people who 'know' them. Thus abstracted and generalised, knowledge can be transmitted independently and in advance of its subsequent application in specific 'real-world' contexts. What is learned is distinguished from how it is learned, and knowledge can therefore easily be

passed between people or taught in formal educational settings (Ingold 2000: 40–47; Lave 1990: 310). There are a number of assertions that are symptomatic of the intrusion of Western concepts of knowledge into discussions of indigenous knowledge. The first is that the elders of any aboriginal community would, in the past, have passed down their knowledge to younger generations. The second is that this knowledge would have been encoded in indigenous languages. Any perceived rupture or interference in these paradigms is thus seen by Western researchers as leading to a reduction in what indigenous people know.

IN contrast, Nadasdy (2003: 95–96), writing about Athapaskan people, argues that indigenous people may generally view knowledge as directly tied to personal experience, as 'an inseparable aspect of a person's being'. Knowledge cannot therefore be taught, or passed between individuals. It must be learnt through personal contact with the world. Meanwhile, there are undoubtedly cultures in which indigenous elders would teach their knowledge to younger generations in educational settings not dissimilar to those recognisable to individuals schooled in the West. However, it is likely that this teaching was also intimately tied to contexts of practice and would mean little to learners if not coupled with practical experience.

FURTHERMORE, it can be argued that in reality learning processes do not follow didactic models, regardless of the learner's cultural background. Information supplied out of context rarely becomes knowledge (Pálsson 1994). Even in Western teaching regimes, children may learn more through personal experience within

the context of the classroom than they acquire through internalising abstracted information (Lave 1990: 320–323). Indeed, forcing Western children to learn decontextualised information for which they can see little use or purpose is blamed for common feelings of insecurity and stupidity associated with Western schooling (Lave 1990: 320–323). It is also suggested that the emphasis on formal schooling of this nature decreases the likelihood of finding employment for all but those who reach the ‘top of the pyramid’, as many forms of employment require years of enskillment derived from practical experience, a form of training that now receives little attention or credibility in the West (Sigaut 1993: 112).

INUIT provide a good example of a culture for which didactic educational models do not hold true. It is doubtful that Inuit knowledge was ever taught in any structured way and learning was instead grounded in contexts of practice (Briggs 1991: 269). This lack of structured teaching was not only practically necessary in the past; it was also important on a spiritual level. Inuit abhor efforts to control others, and personal autonomy is cherished (Briggs 1968: 53 in Omura 2002: 106; Briggs 1970: 42; Briggs 1991: 267; Morrow 1990: 150). Within this philosophy, the unforced development of a child’s *ishuma*, which can be translated loosely as ‘consciousness’ or ‘thought’ or ‘reason’ (Briggs 1991: 267), was considered of particular importance to an individual’s well being. Imposing outside knowledge and ideas onto the process of personal learning and autonomous growth was seen as potentially dangerous interference.

WHILE songs, stories and language were passed on through generations,

their function was therefore not necessarily to ‘teach’ and knowledge may not have been encoded within them. Instead, the purpose of stories and songs was more often to establish and reinforce connections to the land and community. They directed an individual’s attention out into the land, to aid with his or her own discovery of knowledge through personal experience (Cruikshank 1998). Most Inuit knowledge is thus not transmitted to youths from their elders; it is rather drawn from the world itself, a world that reveals itself to younger generations depending on the extent to which they are prepared to attend to it. This process of revelation can be delicately structured and guided within contexts provided by older generations, but ultimately successors develop their own unique knowledge and experience (Ingold 2000: 56, 146, 387). Thus in the past, while elders were held in high esteem, younger generations were expected to learn by experience within the process of doing, lightly guided along the way by their older relatives. They did not sit, listen and learn.

KNOWLEDGE OF THE LAND & ANIMALS TODAY

THE ability to hunt and track is an aspect of their knowledge that most Inuit hunters hold most dear, and they sorely regret its decrease in the younger generations. Older hunters would assure me with pride that their grandson or granddaughter knew how to hunt, or would remark with sadness that they did not. Today the preference for experiential learning and personal autonomous development remains strong within the community of Cambridge Bay. I noticed it many times while out on the land with older Inuit and their



much younger relatives. Occasionally a senior man would issue an order to a youth to make him or her do a certain task, but more often it was simply expected that everyone would fill whichever role they thought necessary. Doing nothing and simply standing around watching was also an accepted alternative. I did not often hear instructions being given on how to do things. No matter how much a youth might struggle with his caribou skinning or with pulling in a fish net, older relatives would either appear not to notice or would watch with mild interest, sometimes apparently taking pleasure in the youth’s attempts and the learning process therein (see also Nelson 1969: 386).

DURING my time in Cambridge Bay I also adopted this method of learning, through participant observation while hunting and travelling. Questions are generally frowned upon by Inuit, and they may find even the mildest queries an incorrigible invasion of privacy (Fosset 2001: 7; Fienup-Riordan 1990: 44; Morrow 1996: 412; Briggs 1991: 269). The *kablunaks*’ (white people’s) love of meaningless talk is for many Inuit a source of frustration and wry amusement. ‘Like *Nowyak*’ (seagulls), one elder told me, mimicking the squawking of rowdy birds with his hands. Whilst out on the land, I therefore learned to curb my enthusiasm and be patient; watching and joining in rather than asking many questions. Overall,



Caribou from the Dolphin-Union herd crossing sea ice (left) and a musk ox, another animal commonly harvested by Inuit hunters (below)



©Melene Hughes

Inuit elders seemed to approve of this method of learning. These sentiments clearly stand in contrast to the rounds of question-driven interviews in which elders are now expected to participate. Consequently, many Inuit politely decline to be interviewed and have their knowledge documented and preserved by researchers. This provides a strong indication that many Inuit do not perceive current efforts to preserve and transmit their knowledge as satisfactory. Inuit told me that they were glad that I simply 'hung out', that I visited, that I spent time with them on the land and that I was slowly learning from them.

I will now attempt to describe what I learnt through personal experience by giving an account of such a hunting trip. This will demonstrate that it is only through personal experience that Inuit knowledge of the land and animals can be learnt and how this process is lightly guided by elders. It begins on an exceptionally cold day in January 2004 when an Inuit elder and I skidooed across wolf tracks in the snow. This was the third day of a hunting trip on the Canadian mainland across the straits from Victoria Island. The temperature had hovered around minus 50 for the duration of our journey. We had camped mostly on the sea ice, making use of the meagre warmth emanating from the unfrozen ocean beneath, which makes camping on ice warmer than on the deep permafrost of the land. The Arctic at this time of year lies in near perpetual darkness, and we were making

use of the gloomy twilight around mid-day to hunt and travel. Despite the failing light my companion, an Inuit man of around sixty years of age, saw the tracks instantly and brought his skidoo to a halt. They were from large animals, and he reported excitedly that they had been made recently, perhaps only hours before. Tracks we had found two days before, belonging to a wolverine, had been dismissed without interest due to their age, but now these tracks offered a real opportunity. There were doubtless many signs that the wolves had passed this way recently, too subtle for me to even guess at. However, the brief twilight hours were running out, and we reluctantly abandoned the spot for our campsite.

THE next morning we got up early, returned to the spot where the wolf tracks crossed our day-old skidoo trail and began to follow them. The wolves had trotted through the rocky hills in a somewhat erratic manner, sometimes moving up onto banks of exposed rock, which we circled until we found the place where they had descended back into the snow. As we followed their winding trail, my companion occasionally pointed out what he saw in the scuffs in the snow. The tracks of smaller animals crisscrossed the larger prints of adult wolves, revealing that we were following a family of two adults and two cubs. Here, they had rested a while in the lee of a rocky outcrop, curled up together. Further on they had given chase to a small herd of caribou, an endeavour that had been in

vain, for the wolves had begun to walk again before the caribou had slowed, and their was no sign of a fresh kill.

AS we weaved our way through snow-choked gullies between low hills of frost shattered rock, all the time tracking these animals, it was possible, with Inuit guidance, to get a sense of how the wolves had spent the last 24 hours; mostly on the move, only resting occasionally, relentless in their search for sustenance, but for the while ultimately unsuccessful in their hunting. After several hours of our pursuit, the tracks led into higher land of rock bluffs and high cliffs, impassable to skidoos. The meagre daylight of late January was already against us, so the hunt was abandoned. We never saw the wolves that day, but nevertheless it had been possible to get an insight into their activities. A while later I was surprised to arrive back at our camp, as I was sure that we had been heading away from it the whole journey. Even after a day of following tracks that twisted around the landscape, the hunter was able to stay oriented and know exactly how to return to the camp without doubling back on himself, in an area he had not visited previously.

Caribou harvested by Inuit hunters on an island in the straits south of Cambridge Bay



WHILE my companion was able to point out certain aspects of the environment that held information about the wolves, he was influencing the way I was able to learn from the environment, rather than teaching me directly. Indeed, from his verbalised observations I was able to learn a little about the wolves, but not much about how this knowledge could be discerned from the environment. For example, I was told that the tracks were fresh, but it remained a mystery to me how this could be known. Another elder later told me that the age of a track can be known by pressing one's finger into the foot print. If the track is soft, it has been made recently. If it is hard, then the track is old. However, once again this information did not mean very much to me until I was able to test it on the land. At the end of my time in the Arctic I still had only a vague grasp of this principal, and no real comprehension of how to utilise it in practice. It was therefore of little use to me, and will remain so unless I spend considerably more time hunting and tracking. As noted already, information supplied without an experiential context will rarely become knowledge (Palsson 1994). My attempts to learn perhaps demonstrate how much experience is often needed for this to be the case.

THE ways that Inuit hunters may know and learn about animals is also touched on in this account. This knowledge of animals is not necessarily of 'things and how they work' (Ingold 2000: 72) but is perhaps best couched in terms

of personhood. Ingold (*ibid*) writes: 'to "know" someone is to be in a position to approach him directly with a fair expectation of the likely response... to be sensible to his tastes, moods and idiosyncrasies... You get to know someone by sharing their companionship. And if you are a hunter, you get to know animals by hunting.' While Inuit clearly possess a great deal of knowledge about animals, little of this may be amenable to direct transmission to younger generations as it is more akin to forming a personal relationship with them. This knowledge must thus be gained through personal experience.

SIMILARLY, for the truly experienced, making their way in the land is not only a matter of recognising landmarks, points or trails, but also of picking up information through a finely tuned perceptual system. This information is not in the hunter's mind, but in the world itself, which opens up to him in greater richness and profundity than it would to the inexperienced individual (Ingold 2000: 55–56). Such knowledge is then accessible far beyond any region in which the hunter has travelled previously, in a way that it would not be were it carried in his mind as a result of a

process of conscious learning and remembering. Wind direction will orient an Inuit hunter, and any changes are duly noted and compensated for. Similarly, snowdrifts will be orientated by the prevailing winds and will give a more fixed view of the direction travelled. The sun, moon and stars also provide points of reference, while nuances in the landscape embed the hunter in a set of related localities. The wife of one hunter was very keen to explain to me how her husband drew on all these things so that he would never go astray, even in the least favourable weather conditions in an area he had never previously visited. A deep understanding of these features subtends conscious attention and establishes instead a sense of intuitive knowing, in which a hunter perceives his position in relation to the town, a camp, or some previously visited destination, without even thinking of it. Efforts to document Inuit place names or hunting routes and teach these to younger generations consequently may do little justice to the knowledge that can be gained through experience. However, as with traditional stories and songs, these activities may serve to direct the attention of Inuit youth onto the land. It must be remembered however that the final goal

should be to know the land, and the map is thus a means and not an end.

FOCUSING on Inuit knowledge as gained by experience, rather than as a discrete set of teachings by elders, has led me to describe here some of the ways that Inuit come to gain knowledge about the land and animals, through direct experience of them. I myself would struggle to explain what I learnt about animals and the land during my time in Cambridge Bay. This in fact became a source of some concern for me as I struggled to report what I was learning to interested academic colleagues, family and non-Inuit friends. This revealed to me the central crux of what I argue in this paper: that researchers, myself included, tend to focus too much for Inuit tastes on that which can be verbalised, written down and passed around. The closest I have been able to come to documenting and transmitting Inuit knowledge, or my own knowledge gained whilst travelling and hunting, is to tell stories about some of the interactions that I witnessed between Inuit, the animals and the land. Even by describing these processes, rather than the knowledge itself, it has become clearer to me just how difficult Inuit knowledge would be to transmit to future generations, if those generations do not interact with the land and animals. Worryingly, presenting Inuit children with books, maps and CDs and informing them that this is the knowledge of their elders may actually serve to restructure, rather than preserve, Inuit ways of knowing the land and animals.

DYNAMISM & STAGNATION

IT is also important to acknowledge a further point while discussing the advantages of an experience-based approach to knowledge preservation, and this is that knowledge should not necessarily be ‘preserved’ at all. While a change in Inuit knowledge and culture is unhappily recognised by many researchers, it should be remembered that flexibility and rapid adaptation have often been hailed as hallmarks of Inuit society (Adams 1971:9). Inuit knowledge was thus always a constantly evolving resource. Maintaining this evolution is essential if the indigenous knowledge learnt by the youth of Cambridge Bay is not to become stagnant and frozen, and consequently of limited utility. The dynamism that is at the heart of Inuit knowledge can best be maintained through experiential learning, as I will now explain.

RAPID adaptation was essential to surviving on the land, and techniques and tools that were no longer the most efficient available would quickly have been modified, or set aside in favour of those more suitable for the exploitation of current conditions and opportunities. There would have been little room for sentimentality over techniques or equipment (Omura 2002; Briggs 1991). Change and adaptation can therefore be said to be the only true Inuit ‘tradition’. Inuit in Cambridge today remain fiercely practical and adaptable, to the point that they can appear brutally un-sentimental about what non-Inuit see as

their ‘traditional culture’. Iglus are rarely constructed as there are tents available, kayaks are not manufactured due to the ease of purchasing an aluminium boat, caribou fur parkas are rarely made as everyone has goose down coats from the store, skidoos are easier to manage than dogs, and guns are more effective than bows and spears. For Inuit to refuse to take up these modern conveniences and focus instead on the past would actually be more of a break from pre-contact modes of thought and practice than a continuation of them (Ingold 2000: 147–148). Indeed, having fixed views on what it is to be ‘traditional’ can be taken by other Inuit as a sign of inflexibility, a distinctly non-Inuit trait (Dahl 2000: 7–10; Omura 2002: 106–108).

WHAT therefore emerges as ‘traditional’ in Inuit understandings is the use and acceptance of modern infrastructure, such as guns, skidoos, boats, wage labour and permanent housing. It might be expected that this ready adoption of new technologies would, to an extent, have diminished Inuit ‘traditional’ knowledge (Aporta and Higgs 2005: 740–742). However, these technologies are improvised with, remade and flexibly utilised in distinctly Inuit ways (Omura 2002: 107–108) allowing Inuit skills to thrive in the new era of machines (see Sigaut 1993: 109–110). Inuit knowledge has thus often evolved alongside current changes to Inuit lifestyles, to yield a distinctly Inuit approach to their new technology, an approach of which Inuit remain proud (Briggs 1991: 263; Omura 2002: 107–108).

Skidoos taking an Inuit youth and an ecologist on a day-long caribou hunt



©Peter Bates

THERE were numerous times during my stay in Cambridge Bay when I was struck by the skills of Inuit hunters to improvise with what I initially saw as thoroughly modern technologies. A leaking modern boat in which I travelled was hauled ashore many hours from the community and mended with a fish-can lid. We then continued hunting for caribou along the coast, rather than fleeing the choppy waters for the safety of the community. A gash in the hull of another friend's boat was mended using a sheet of scrap metal, rubber from an old inner tube found at the dump, old rivets, and some glue. Skidoos also were frequently remade, mended, taken to pieces or plundered for parts, and it was with pride that a hunter would explain that he had fixed up a machine at no expense using items scavenged from the village dump. Meanwhile, people who bought new things, or paid for their repair, often seemed to be perceived as somehow cheating. For those who regularly hunt and travel on the land, their environmental knowledge is thus moving with the times, and now includes practical skills on a whole new range of topics, to suit this shift in their hunting and travelling techniques. Suggestions that modern influences may contaminate Inuit knowledge and diminish its value are therefore worrying (e.g. Wenzel 1999: 117) and may cause Inuit youth who use modern technologies to feel divorced from their culture.

MOREOVER, Agrawal (1995), Anderson (1999: 158–163), Bravo (2000: 473–474) and Ellen and Harris (2000: 11) point out that indigenous knowledge systems have rarely developed in isolation, a reality sometimes obscured by researchers who desire to represent them as somehow pure and unspoilt. In the creation of present-day Inuit knowledge there has been an exchange

of concepts, ideas and information with the Western world since first contact was made between the two cultures. During this process Inuit would often have willingly, or even unwittingly, taken on what is useful to them and discarded what is not. In other situations, colonial educational regimes may have actively forced Western knowledge onto Inuit. Current changes in Inuit knowledge could therefore be seen as the latest stage in a process of fluidity, change and exchange that has been going on for thousands of years, and it would certainly be premature and overly pessimistic to think of current shifts as a point of rupture or a source of direct threat to Inuit knowledge and culture. As Ingold (2000: 147) notes, change is what we see if we look at a continuous process only at separate points in time.

CONTEMPORARY Inuit knowledge incorporates modern weather forecasts, television documentaries, the findings of scientific research and a wealth of other 'modern' influences. These sit easily alongside field mechanics, machine maintenance, the use of firearms, GPS devices and a suite of other techniques that are intimately tied to working within the land today, all approached in a distinctly Inuit way and combined with in-depth knowledge of the land and animals. These new skills are adding to Inuit knowledge at a time when it needs to be at its most fluid, and these influences can augment rather than diminish the knowledge that Inuit need to bring to bear on their current situation. Only through sustained experience of hunting and travelling can this dynamism be ensured. This process could be aided greatly by encouraging younger Inuit to hunt and travel, and advocating experience-based learning. In contrast, the formal teaching in the schools of static visions of what Inuit knowledge used to be is cause

for concern, for it will be out of sync with a dynamic process of knowing the land and animals that has generally been successful in moving with the times.

LANGUAGE

AS already mentioned, another symptom of the dominance of Western concepts of knowledge is the common supposition that the fundamental values and concepts of a culture are encoded in its language. In this conception of knowledge, the failure of younger generations to learn the language of their elders could lead to a direct and immediate loss of knowledge about the environment. However, I have argued that in the case of Inuit, much of their knowledge is not directly transmitted from the elders, but is acquired from the land itself, the perception of which may be gently guided by older relatives. I would suggest also, for the same reasons, that younger generations generally derive their moral and conceptual bearings not from verbally or linguistically encoded messages but from example and experience situated within contexts of practical activity. Much of this wisdom is not articulated verbally, but even when it is, the words often derive their meanings from the contexts in which they are uttered rather than importing meanings into their contexts (Suchman, 1987: 58–9; Ingold, 2000: 147). Languages are thus flexible tools continuously moulded and reshaped to reflect and express changing cultural norms. They are rarely fixed entities in which knowledge is encoded. This is not to deny that language has a bearing on how we perceive the world, but recognises that the way we perceive the world has a far greater bearing on the ways that language is utilised and understood.

WHILE there are undoubtedly some examples of highly specific terms in indigenous languages that refer to culturally specific knowledge, to suggest that words in another language will not be manipulated to convey this knowledge may greatly underestimate the resilience of indigenous ways of knowing. Just as Inuit knowledge and skills can flourish through modern technologies such as skidoos and boats, so too can a distinctly Inuit way of perceiving the world be expressed through the colonial language. English words can often be modified and manipulated to convey embodied knowledge gained from experience, just as Inuinnaqtun words once did. There were many times throughout my stay in Cambridge Bay that I realised that English words, the meanings of which I had initially taken for granted, were being utilised differently by Inuit acquaintances. An example is the word 'lazy'. While I considered the word a mild insult, applied to those who were idle, I slowly realised that for Inuit, who have different ideas about work ethics and the need to be busy, the word did not imply any value judgement. Indeed, often it seemed to be considered that a period of being 'lazy' was a good thing, befitting the character of a sensible person. That English words can be given meanings by indigenous people that differ from their interpretation by Westerners has

also been highlighted as a crucial issue in the failure of some co-management schemes (Morrow and Hensel 1992). Western resource managers and indigenous people may believe themselves to be talking about the same issue, when actually both sides are using the same terminology to describe completely different concepts. Examples include the terms 'conservation', 'respect' and 'management' as they relate to the environment. For Western biologists these terms are centred on protecting nature from human influences, but for indigenous people they more often refer to the importance of human involvement and interaction with the environment, which can include proper hunting rituals in which harvests should not be limited for fear of giving offence to the animals. This again demonstrates the resilience not just of indigenous knowledge, but also of indigenous ways of conceptualising the world, despite the influence of a colonial language.

MOREOVER, where no convenient substitute presents itself in English, a multitude of Inuinnaqtun words are seamlessly utilised in everyday English communication, not just amongst Inuit youth, but also amongst non-Inuit in the community who regularly find themselves presented with items, situations or concepts for which

English does not provide the vocabulary. Examples include 'kamotiks' (big wooden sleds), 'ulus' (distinctive Inuit knives), 'kablunaks' (white people) and 'amautiks' (smocks in which infants can be carried). These words are generally grammatically treated as though they are English words, for example plurals are indicated by adding an 's' rather than the Inuit 'it' ('two ulus', rather than 'two uluit') and verbs are conjugated using English suffixes, for example, 'she is mamaking' or 'she mamaks' (she suckles or nurses), rather than 'she mamaktuq'.

THAT children no longer know the names for plants or animals that they no longer have contact with, or which no longer exist in their environment, may not prove that the loss in language has caused the decline in knowledge. Rather, the reverse is true. Even in a 'healthy', rapidly spreading language such as English, changes in language use will occur with shifts in livelihood and environment. For example, few English speakers in Britain now know the complex terminology associated with thatching roofs or tending for horses. This is because these terms are no longer necessary in day to day life, and the language use has shifted accordingly. It is not the case that the language is declining and has eliminated the knowledge with it. Such dynamism is an essential part of a healthy knowledge and language system.

THUS the cessation of a traditional language will not necessarily in itself lead to a loss of knowledge or a fundamental change in its nature (Ingold 2000: 147). Likewise a shift from one dominant language to another, in this case from Inuinnaqtun to English, does not necessarily entail any corresponding shift in perception and orientation. If Inuit continue to interact with the land, they

The coast near Cambridge Bay, where Inuit have hung Arctic char to dry in the sun



©Peter Bates

will continue to learn from it. It is alterations in lifestyles and in the relationship to the land, guided by their elders, itself that will have a greater impact on the ways that Inuit perceive and respond to the world around them. Language shift will then trail these alterations rather than bringing them about.

IT is therefore arguably more important to encourage Inuit youth to maintain an active interaction with the land than to attempt to preserve the Inuit language. However, claims that knowledge is directly tied to language may lead to the dubious conclusion that Inuit children will maintain the knowledge of their grandparents so long as they master Inuinnaqtun. In Cambridge Bay far more attention is currently given to teaching children the Inuit language than is spent encouraging them to interact with their elders on the land. The result is that children are expected to learn a dislocated stream of words which mean little to them, and Inuinnaqtun lessons become unsatisfactory and unproductive as a result, hastening rather than slowing the language's decline.

EFFORTS to protect endangered languages have a crucial part to play in maintaining cultural diversity. It is therefore important that paradigms are devised which suitably express this need. However, directly tying language to knowledge and culture must be carefully considered. To suggest that linguistic diversity is an essential component of cultural diversity fails to recognise the many diverse cultures of the world which speak the same language. Furthermore, such assertions may be disempowering and rather insulting to the many diverse cultures, of which Inuit culture is just one, which have maintained their distinctiveness whilst adopting a colonial language. Such suppositions may there-

fore damage rather than support the aspirations for cultural continuation held by some indigenous groups.

PRACTICAL IMPLICATIONS

ADVOCATING an experiential approach to learning may be impractical for some indigenous groups. However, in Cambridge Bay, which is surrounded by open tundra and ocean as yet unaffected by biodiversity loss or drastic habitat change, it would not be difficult to arrange regular hunting and camping expeditions with willing parents and grandparents, and indeed many Inuit families already regularly engage in these activities. Furthermore, while learning in the way I have advocated may seem to have limited utility in modern Inuit society, it should be remembered that knowing the land is becoming increasingly profitable for Inuit. Throughout northern Canada it is now a policy requirement that the knowledge of indigenous people be incorporated into environmental assessment and resource management (Usher 2000). Nunavut's Inuit Government has also determined that it will utilise Inuit knowledge as a method of aligning the territory's policies towards Inuit philosophies and away from Western thought processes (Bravo 2000: 471–472). As Inuit are paid for research contributions, talking about the land and animals has become lucrative and prestigious for many elders and hunters who are recognised as knowledgeable due to their frequent hunting and travelling, despite the limitations of transmitting Inuit knowledge in this way and the reservations of many Inuit about these processes, as already discussed.

FURTHERMORE, in a community where jobs are limited and unemployment levels are high, there can be few

opportunities to utilise the lessons learnt in school. Meanwhile, many families support themselves additionally through various subsistence activities on the land, which reduce family expenditure on bought food items. The 'replacement value' of land food in Nunavut has been estimated at between \$30 and \$35 million a year (Hicks and White 2000: 38). In a territory with a population of less than 30,000 individuals, its importance should not therefore be downplayed in generating a healthy economy. Maintaining detailed knowledge of the land therefore becomes increasingly practical and viable for ambitious young Inuit. This knowledge may therefore provide a path to the future, as well as maintaining links to the past.

CONCLUSION

THROUGHOUT this paper I have argued for an experientially-based approach to indigenous knowledge transmission in Inuit communities, which I have argued transcends concerns for cultural change or language loss. This is not to suggest that classroom based efforts should be abandoned, or that languages should be allowed to decline. It is instead a recognition that these efforts will mostly prove fruitless without an experiential context to the learning process, and that only through maintaining, encouraging and facilitating contact with the land can the distinctive nature of Inuit knowledge be maintained. At present, the repackaging of a previously experientially-based knowledge system into discrete items of information encoded in books and CDs runs the risk of precipitating one of the biggest shifts in Inuit knowledge possible: a restructuring of Inuit concepts of what it means to be knowledgeable, and how one should know the world.

REFERENCES

- Adams, C.** 1971. Flexibility in Canadian Eskimo Social Forms and Behaviour: A Situational and Transactional Appraisal. Guemple, L. (ed.), *Alliance in Eskimo Society*. Proceedings of the American Ethnological Society. Seattle & London, American Ethnological Society.
- Agrawal, A.** 1995. Dismantling the Divide Between Indigenous and Scientific Knowledge. *Development and Change*, 26:413–429.
- Anderson, D.** 1999. Rangifer and Human Interests. *Rangifer*, 20(2-3):153–174.
- Aporta, C. and Higgs, E.** 2005. Satellite Culture: Global Positioning Systems, Inuit Wayfinding, and the Need for a New Account of Technology. *Arctic*, 46(5):729–753.
- Balikci, A.** 1970. *The Netsilik Eskimo*. New York, Natural History Press.
- Bravo, M.T.** 2000. Cultural Geographies in Practice: The Rhetoric of Scientific Practice in Nunavut. *Ecumene*, 7(4):468–474.
- Briggs, J.L.** 1970. *Never in Anger: Portrait of an Eskimo Family*. Cambridge MA, Harvard University Press.
- Briggs, J. L.** 1991. Expecting the Unexpected: Canadian Inuit Training in an Experiential Lifestyle. *Ethos*, 19(3):259–287.
- Brody, H.** 1975. *The People's Land: Eskimos and Whites in the Eastern Arctic*. Hermondsworth, Penguin Books Ltd.
- Collignon, B.** 1993. The Variations of a Land Use Pattern: Seasonal Movements and Cultural Change Among the Copper Inuit. *Études/Inuit/Studies*, 17(1):71–89.
- Condon, R.G., Collings, P. and Wenzel, G.** 1995. The best part of life: Subsistence hunting, ethnicity and economic adaptation among young Inuit males. *Arctic* 48:31–46.
- Cruikshank, J.** 1998. *The social life of stories: narrative and knowledge in the Yukon Territory*. Lincoln, University of Nebraska Press.
- Dahl, J.** 2000. *Saqqaq: An Inuit Hunting Community in a Modern World*. Toronto, Buffalo. London, University of Toronto Press.
- Damas, D.** 2002. *Arctic Migrants, Arctic Villagers: The Transformation of Inuit Settlement in the Arctic*. Montreal and Kingston, McGill-Queen's University Press.
- Ellen, R and Harris, H.** 2000. Introduction. Roy, E., Parkes, P. and Bicker, A. (eds.), *Indigenous Environmental Knowledge and its Transformations*. Amsterdam, Harwood Academic. Pp. 1–33.
- Fienup-Riordan, A.** 1990. *Eskimo Essays: Yup'ik Lives and how we see them*. New Brunswick, Rutgers University Press.
- Fosset, R.** 2001. *In Order to Live Untroubled: Inuit of the Central Arctic 1550–1940*. Winnipeg, University of Manitoba Press.
- Freeman, M.M.R.** 1976. *Inuit Land Use and Occupancy Project*. Ottawa, Minister of Supply and Services Canada.
- Hicks, J. and White, G.** 2000. *Nunavut: Inuit Self Determination Through a Land Claim and Public Government?* J. Dahl, J. Hicks and P. Jull, (eds.), *Nunavut: Inuit Regain Control of their Lands and their Lives*. Copenhagen, IWGIA.
- Ingold, T.** 2000. *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. London, Routledge.
- Lave, J.** 1990. *The culture of Acquisition and the Practice of Understanding*. Stigler, J.W., Shweder, R.A. and Herdt, G. (eds.), *Cultural Psychology: Essays on Comparative Human Development*. Cambridge, Cambridge University Press.
- Morrow, P.** 1990. Symbolic Actions, Indirect Expressions: Limits to Interpretations of Yupik Society. *Études/Inuit/Studies* 14(1–2):141–158.
- Morrow, P.** 1996. Yup'ik Eskimo Agents and American Legal Agencies: Perspectives on Compliance and Resistance. *The Journal of the Royal Anthropological Institute* 2(3):405–423.
- Morrow, P and Hensel, C.** 1992. Hidden Dissent: Minority-Majority Relationships and the Use of Contested Terminology. *Arctic Anthropology*, 29/1:38–53.
- Nadasdy, P.** 2003. *Hunters and Bureaucrats: Power, Knowledge and Aboriginal – State Relations in the Southwest Yukon*. Vancouver, Toronto: UBC Press.
- Nelson, R.K.** 1969. *Hunters of the Northern Ice*. Chicago, University of Chicago Press.
- Omura, K.** 2002. *Construction of Inuinaqtun (real Inuit way): Self Image and Everyday Practices In Inuit Society*. Stuart, H., Bernard, A. and Omura, K. (eds.), *Self and Other Images of Hunter Gatherers*. *Senri Ethnological Studies* 60.
- Pálsson, G.** 1994. Enskilment at Sea. *Man (N.S.)*, 29:901–927.
- Rigby B., MacDonald, J. and Otak, L.** 2000. *The Inuit of Canada*. Freeman, M.M.R. (ed.), *Endangered People's of the Arctic: Struggles to Survive and Thrive*. Westport, CT, Greenwood Press.
- Sigaut, F.** 1993. Learning, Teaching and Apprenticeship. *New Literary History*, 24:105–114.
- Suchman, L.** 1987. *Plans and Situated Actions: The problem of human-machine communication*. Cambridge, Cambridge University Press.
- Thorpe, N.** 1997. *The Tuktu and Nogak Project: Inuit Knowledge about Caribou and Calving Areas in the Bathurst Inlet Region*. *Arctic*, 50(1):381–884.
- Usher, P.J.** 2000. Traditional Ecological Knowledge in Environmental Impact Assessment and Management. *Arctic*, 53:183–193.
- Wenzel, G.** 1999. Traditional Ecological Knowledge and Inuit: Reflections on TEK Research and Ethics. *Arctic*, 52(2):113–124.



**AFRICAN HUNTER-GATHERERS: THREATS AND OPPORTUNITIES FOR
MAINTAINING INDIGENOUS KNOWLEDGE SYSTEMS OF BIODIVERSITY**

NIGEL CRAWHALL

INTRODUCTION

'**KNOWLEDGE** is power' – or so goes the saying. This apparently is not the case in Africa, where rural hunter-gatherer peoples are holders of complex and unique knowledge of biological diversity but find themselves vulnerable as peoples, pressured into formal schooling, which reduces their knowledge and competencies, and then ignored or marginalised from external efforts to conserve nature.

THIS paper explores the causality of threats to the intergenerational transmission of biological diversity knowledge systems among hunter-gatherer peoples in Africa. I look at environmental and political issues which lead to indigenous peoples not transferring knowledge between generations, and I consider some of the actions possible to change the relationship between the state and indigenous peoples in Africa.

A set of case studies provides examples of what is going on in different parts of Africa, exploring the types of knowledge that hunter-gatherers have and what they are doing to stabilise themselves and engage with the threats and opportunities in front of them.

I argue that the failure of the state, conservation agencies and indigenous peoples to hear each other and recognise the importance and urgency of greater cooperation on monitoring and protecting both biodiversity and cultural diversity can be seen as a problem of intercultural dialogue. Improved facilitation can lead to changes in relationships and prejudices, and generate new ways to recognise and respect indigenous knowledge systems (IKS). Linking IKS-related skills and competencies to

the labour market is one way in which the state finds it easier to recognise and value traditional knowledge.

THE United Nations' agencies that are working in Africa can play a catalytic role in mediating intercultural dialogue and helping the different actors recognise their mutual interests and ways of cooperating. To be effective, the different agencies of the UN would benefit from a more coherent and consolidated approach, focusing on the relationship between cultural diversity, human dignity, knowledge management, sustainable development and the monitoring and management of biological diversity.

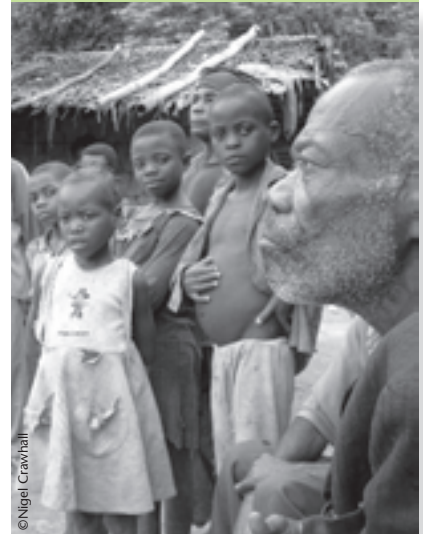
TERMINOLOGY NOTE

TWO related concepts are in circulation internationally relating to knowledge held by communities outside the framework of literacy and formal study. These are Traditional Knowledge (TK), a term which is used particularly by the Convention on Biological Diversity (CBD), and Indigenous Knowledge Systems (IKS), which is more widely used in the UNESCO instruments.

IN this paper, I use the term IKS, in part because knowledge is not a collection of facts but a system of thought with its own internal logic and epistemology. Having said this, it is one of the themes of this paper that all Africans are holders of various forms of TK, whether they claim the status of indigenous peoples or not. The focus of this discussion is on rural IKS linked to traditional economies that are or were recently dependent on the successful sustainable use of natural resources.

THE other issue is the use of the term 'indigenous peoples'. Some African states

Elder with youth: Bakoya elder and youth, Mekambo commune, Gabon



have expressed hostility to the idea that certain citizens have associated themselves with international standards, mechanisms and rights frameworks specific to indigenous peoples. However, there is a growing indigenous peoples' advocacy movement in Africa and it has the support of Africa's regional human rights body. In 2003, the African Commission on Human and Peoples' Rights (ACHPR), the treaty and jurisprudence arm of the Charter and the African Union adopted the report of its working group on indigenous communities. The ACHPR noted that the concept of 'indigenous peoples' as a rights category comes from the international system, but is applicable in Africa. There are internal cultural and legal precedents for recognising that some Africans are particularly vulnerable to human rights abuses because of their distinctive economic and cultural practices, in some cases related to being the first peoples of a territory. The African Charter on Human and Peoples Rights guarantees all African peoples the

right of self-determination (within the framework of the charter).

CULTURALLY, the concept of indigenous or first peoples is not alien to Africa. Some major African cultures and languages have explicit terms for indigenous peoples. In southern African Bantu languages there are terms such as *Abathwa*, *Baroa*, *Batwa*, *Basarwa* etc. which are applied to a range of hunting and gathering peoples. In East Africa, the term *Dorobo*, derived from the Maa word *Il Torobo*, those without cattle, was applied to hunter-gatherers of the region. In the African context, even though the term 'indigenous' came to Africa from the international system, it should be understood to describe certain marginalised groups who actively seek support to redress their marginalisation while asserting their rights to their language, culture and natural resource base. Unlike in the Americas, Australia or the Arctic, in Africa, those who are not claiming to be indigenous are not by contrast 'non-indigenous' (a point often confused in African discussions) but local peoples who do not seek the specific policy recognition and protection necessary for indigenous peoples.

TODAY, peoples claiming to be indigenous in Africa are mostly those who have been living by hunting and gathering or by transhumant pastoralism. These are different peoples who have evolved their cultures and subsistence methods in particular ecological niches.

CAUSES OF THE THREAT TO IKS MAINTENANCE

ALL hunter-gatherer and post-hunter-gatherer peoples are 'at risk' as peoples in Africa. Jared Diamond, in his book *Guns, Germs and Steel* (1997), lays

out a compelling argument that globally, hunter-gatherers have been on the retreat since the start of agriculture. Agricultural peoples have bigger families and expand over large territories, eventually transforming the landscape so that hunting and gathering becomes unviable. In Africa, the tropical rainforests and deserts slow the advance of agriculture (Diamond 1997). It was during colonialism that hunter-gatherers became structurally marginalised. The European powers concentrated on integrating food producing (and tax producing) peoples into the education system, commodity economy and bureaucracy. These peoples later took over the state system, with hunter-gatherers in practice left out of governance.

GLOBALISATION, marginalisation from the agricultural state, centralised state planning and weak or poor management of natural resources put the very survival of hunter-gatherer peoples in question. Whereas once forests and deserts protected indigenous peoples, modern technology could overcome these barriers, creating new risks.

IN traditional subsistence economies, but also in a labour market, the most valuable asset of hunter-gatherers is their knowledge of biological diversity. It is a resource which has suddenly become important at the United Nations level in discussions about climate change, desertification and monitoring and managing biological diversity. Unless something substantial is done, the peoples and their knowledge will not survive to assist in the global project of protecting the earth and its resources.

THE immediate cause of knowledge loss is that indigenous peoples are being inhibited from regularly using or managing natural resources in the

manner which they have done for centuries or even millennia. Either the biological diversity itself is being destroyed by outsiders, or the indigenous peoples are being dispossessed of their lands and no longer have access to their regular hunting and gathering territories.

IKS is passed on through usage and cultural systems of apprenticeship. Where this is inhibited, the knowledge systems degrade. This is a central point in the CBD 2004 Addis Ababa Guidelines on the Sustainable Usage of Natural Resources. In brief: use it or lose it. The guidelines go on to note that those who rely on natural resources are more likely to be good custodians of these resources. Those with short term interests are the greatest threat.

THE CBD Secretariat has commissioned a series of regional papers and a consolidated global report on the threats to TK transmission. For Africa, a few main points merit elaboration. The most acute and devastating threats to knowledge systems arise from:

- ◆ Destruction of desert biological diversity (mostly by agriculture and overgrazing);
- ◆ Destruction of forest canopy biodiversity (mostly by industry or agricultural encroachment);
- ◆ Reduction in rights or opportunities to track and hunt (including alienation of resources by protected areas);
- ◆ Displacement from or serious reduction of access to traditional hunting-gathering and transhumant herding territories (by agriculture, industry or protected areas).

THESE issues vary according to the sub-region in Africa. In southern Africa, the main problems arise from agro-pastoralists and commercial farms encroaching on sensitive arid areas and destroying the natural biodiversity. The plant system is overwhelmed by grazing domesticated ungulates, which kills off the resources for different birds, insects and mammals. Traditional pastoralism involved wide ranges of transhumance, but land alienation causes overstocking and commercial farmers tend to keep their grazing lands at the outer edge of capacity — which becomes a crisis during drought. The need to separate domestic stock from wild animals has led to extensive fencing which interrupts migrations and radically reduces the numbers of larger mammals, including predators. The food base for San hunters has consequently been reduced dramatically in the last 50 years throughout the subcontinent.

IN East and Central Africa the problem is more related to forestry activities. Commercial interests, legal and illegal, are removing large parts of the tropical forests. The Mau Forest complex in Kenya has been devastated by deforestation, causing a collapse in the biodiversity and radically reducing water reserves normally stored in high altitude swamps and springs. The Cheranganyi Forest is becoming the current focus of destruction. Donors are giving Kenya resources to address the corruption which is a driving force in deforestation. It is not clear that the government has the will or the capacity to reverse the current trend. Within this dangerous situation, Kenya still does not recognise the ethnic groups which have traditionally hunted, gathered and maintained the biodiversity of the forests, the so-called '*Dorobo*' peoples.¹

¹ This includes the Elmolo, who are recognised by the state, and unrecognised peoples including the Sengwer, Ogiek,

IN both East and Central Africa, agricultural peoples continue to experience surging population numbers. In the absence of effective state environmental policies and management, they are invading and destroying forest areas. Indigenous peoples are highly vulnerable to these larger and usually aggressive farmer communities.²

IN 2006, the African Biodiversity Network (ABN) and the Indigenous Peoples of Africa Co-ordinating Committee (IPACC) held a joint workshop on traditional knowledge and biodiversity in Nanyuki, Kenya. One of the conclusions was that there has been a knock-on effect due to globalisation and poor governance of resources in rural areas. Commercialisation of agriculture and forestry is impacting negatively on subsistence farmers; they are encroaching on the semi-arid lands of pastoralists and destroying the forests of the hunter-gatherers. In turn, pastoralists are pushed into more marginal lands and are displacing or assimilating hunter-gatherers. In each case, there is a related loss of biodiversity, indigenous knowledge systems and livelihoods.

THE damage to natural biological diversity is compounded by policy/political problems, including:

- ◆ Non-recognition of indigenous peoples by the state (despite the ACHPR decision of 2003 to recognise indigenous peoples);
- ◆ Hunter-gatherers in particular inhabit small remote rural communities with no voting power, no political

Endorois, Northern Waata, Southern Waata, Yaku, Aweer and Dahalo.

² For a discussion on the interaction of forest based hunter-gatherers and agricultural peoples in Central Africa, see Bahuchet et al. 1982.

representation and very low levels of education and organisational capacity, i.e. they are some of the most vulnerable people in Africa;

- ◆ Even large pastoralist communities struggle to be included in policy making and implementation in rural areas;
- ◆ There is a low interest in human rights and democratic or efficient governance in many African states;
- ◆ Many African governments have limited capacity to spend time in rural areas getting to know indigenous communities and understanding how IKS can be supported;
- ◆ African education systems are remarkably resistant to change, innovations, or using local and traditional IKS in meaningful ways that can help fight poverty;
- ◆ Conservation organisations tend not to be competent in indigenous languages, and do not have the time, personnel or funding to spend adequate time with indigenous peoples to help them audit, valorise, and apply IKS to nature conservation and new livelihoods.

THOUGH the conditions for the degradation of IKS are almost entirely created by external forces (i.e. neighbouring peoples, the state, the private sector) there are negative sociological processes and reactions found within hunter-gatherer communities. The cumulative impact of these two preceding sets of conditions means that at community level:

- ◆ Adults and youth see hunting as something shameful and possibly illegal;

- ◆ Youth are losing interest or opportunities to learn biodiversity IKS in the normal way through daily hunting, gathering or herding;
- ◆ Elders lose confidence that their knowledge is useful, and may not understand the new types of livelihoods which could be gained by youth with access to IKS;
- ◆ IKS is intangible and people do not see how fast it is disintegrating;
- ◆ Constant racial/ethnic bias and discrimination against indigenous peoples make some of the youth want to avoid IKS.

KNOWING & UNDERSTANDING

A number of aspects of indigenous peoples' knowledge systems are important for conservation and the sustainable management of natural resources. However, the way indigenous peoples hold and manage knowledge may differ substantially from the way that dominant, particularly Western, people expect to access, hear or understand biodiversity expertise.

KNOWLEDGE systems are located within cultural systems. In the first instance, they are coded in languages which arose within particular ecosystems. In the case of hunter-gatherers, languages and speech behaviour are structured to accommodate non-hierarchical social systems where knowledge is evenly distributed. Social relations are linguistically coded according to the specific local mode of subsistence or production. Power relations are not coded in the same way in hunter-gatherer societies as compared with agricultural or commodity driven societies.



A Hadza archer demonstrates his technique, Yaeda valley, Tanzania

consultation with indigenous communities, and how knowledge systems are maintained, transmitted and owned.

HUNTER-GATHERERS typically have flat social structures. Specialisation of skills is gender and age specific; it is not stratified in any kind of class or hierarchal system. Everyone knows the same things, though some may be better at a certain skill than others. Even personal skill is de-emphasised for the sake of keeping social cohesion and solidarity. An expert tracker is not the one who brags about his competence. A great shaman is able to do what he does through the negation of his ego, not by making it a central consideration. This can confuse outsiders trying to pinpoint sources of expertise.

ONE of the ways that learning and knowing is maintained amongst hunter-gatherers is a constant sharing of knowledge and its collective management. Hunter-gatherers typically operate in small bands that can fuse and fission easily. This alleviates possible conflict situations, circulates genetic diversity, maintains identity, and minimises the ecological footprint of humans on the environment (for a discussion on conflict management see Lee 2003).

THE issue of how hunter-gatherers memorise and transmit knowledge is complex and important to reflect on. Megan Biesele (1993) estimates that the Jul'hoan language and story telling

AS stated by Leacock et al. (1982: 7–8) 'a mode of subsistence *perse* is not a "mode of production". The latter includes not only the means for making a living but also the relationships involved... Similarities among foragers include: egalitarian patterns of sharing; strong anti-authoritarianism; an emphasis on the importance of cooperation in conjunction with great respect for individuality, marked flexibility in band membership and living arrangements generally; extremely permissive child-rearing practices; and common techniques of handling problems of conflict and reinforcing group cohesion, such as often-merciless teasing and joking, endless talking, and the ritualisation of potential antagonisms.'

THE failure to grasp the non-hierarchical, anti-authoritarian nature of hunter-gatherer and even post-hunter-gatherer societies often makes it difficult for policy makers, conservationists and civil servants to understand the entry points for

Ostriches in Kgalagadi
Transfrontier Park, South Africa



could maintain up to 150 years of experience in the awareness of the community. Information is maintained to inform the band about different foods available under different climatic conditions, as well as information on animal and human behaviour in different times and places.

FOLKLORE and other forms of narrative, for instance, provide a kind of scaffolding upon which explicit information about resources can be vividly and memorably hung. The cognitive ability to represent situations removed from the immediate sensory field is, as point out by Robin Ridington (1978: 9) and others, basic to the social hunting and gathering adaptation. Instead of seeing the symbol systems of hunter-gatherers as superfluous aesthetic activity, then, we ought to regard them as enabling features of their adaptation (Biesele 1993: 42).

FOOD and hunting stories are stitched into flexible narrative forms which relate knowledge of animal behaviour. The 'folk tales' are cross referenced with the technical skills of the tracker. In the Kalahari, a set of imprints in the sand can reveal an animal's species, sex, age, health, purpose of its journey, whether it has young, and the time it passed within an hour or less. In the rainforest, the hunter is using marks in the mud and signs left on the foliage. In the Tanzanian forest, tracking is only used once an arrow has struck

its target and blood spoor becomes the focus. In each case there is a mutually reinforcing pattern of background information and acute awareness of animal behaviour and predictability.

KNOWLEDGE is coded to be applied at different times of the day, different seasons of the year, over vast territories, in different annual climactic conditions. This is also tied to reciprocal individual and family relations of access to water resources and hunting rights. Genealogical relationships are thus important. When documenting ꞆKhomani San genealogy in South Africa, we encountered an 'illiterate' grandmother who had memorised up to 500 genealogical relations in their community (Crawhall 2001).

WORKING between different cultural systems requires an awareness of the dynamics of successful intercultural dialogue. It would be an incorrect assumption, for example, to think that all rural African communities hold and manage knowledge in the same way.

IN the next section, I consider three case studies of hunter-gatherer peoples in different parts of Africa, faced with similar problems of decreasing biodiversity, increasing threats from over-consumption and severe ethnic discrimination.

THREE AFRICAN CASES

ON AN ESCARPMENT OVERLOOKING THE YAEDA VALLEY, NORTHERN TANZANIA

HADZA men have identified a potentially rich bee hive inside a towering baobab tree. A teenager uses a machete to prepare wooden stakes that he drives into the baobab to create a staircase. Others prepare a torch of smoking leaves. The youth smokes the bees to calm them, receiving encouraging words from below. He opens up the hive and tosses down clods of honey soaked wax combs. The youth leaves enough combs intact for the bees to restart their work and continue on undiscouraged.

THE dripping hot honey is nutritious. It is too rich for those not used to this diet. The Hadzabe show us four different types of bees and sources of honey in this forest. Our guide explains that the Hadzabe people have no word for famine.

WHEREAS agricultural and herding peoples in the area have memorial stories of starvation, the Hadzabe have always relied on a broad spectrum of foods that are abundant in Yaeda Valley, nutritious food that is invisible to all other peoples passing through this semi-arid area.

HADZABE

THE 1,000 Hadzabe are the aboriginal people of Tanzania (see Madsen 2000; Woodburn 1997). They speak a click language unrelated to any other language (Sands 1998). Genetic research by Knight et al. (2003) has shown that some of the Hadzabe have a unique genetic signature through their paternal line (y-chromosomes) and maternal line (mitochondrial DNA) that mark them as the second oldest people on earth, after the southern African Khoesan peoples. They have apparently maintained their cultural integrity for the last 60,000 to 90,000 years.

IN the last century, the Hadzabe have been challenged by the encroachment of rapidly expanding agricultural and particularly pastoralist peoples who have themselves been displaced from other areas. The Hadzabe estimate that

their traditional resource territory has been reduced by 70 per cent. Some Hadzabe are now being drawn into wage labour and life in towns near the Yaeda Valley. There, traditional knowledge is dying out quickly. However, in the valley itself the Hadzabe have remained active on their land despite pressures and expansion from other peoples.

THE Hadzabe put their survival down to two major factors. Tsetse flies carry the fatal cattle disease trypanosomiasis.³ The tsetse barrier held back the migration of agro-pastoralist peoples into southern Africa for centuries. The valley is particularly infested and hence unattractive to surrounding Datoga and Maasai peoples. Also, water is scarce in the valley. The Hadzabe rely on vegetable water sources and a few fresh water sources up on the face of the escarpment. In 2003,

³ See <http://www-micro.msb.le.ac.uk/224/Trypano.html>

a well was sunk by a 'development' agency near the Mongo wa Mono, the local district administrative centre. The area was rapidly occupied by pastoralists (see Dimmendaal 1989 for a review of hunter-gatherer ecology).

THE Hadzabe are actively using their IKS to create new livelihoods and affirm their management of wildlife in their reduced territory. They have made an important alliance with local eco-tourism ventures which have helped them gain legal control over the Yaeda Valley as a community controlled nature conservancy. The Hadzabe are the majority of the voters in this particular village administrative structure and the national government is well disposed to promoting community based eco-tourism. The Hadzabe formed the Ujamaa Community Resource Trust and use the eco-tourism profits made from visiting tourists to help pay their neighbours to keep out of the valley. The results are optimistic, with the number of game starting to increase again in the territory.

THE Tanzanian Government has remained resistant to the recognition of indigenous peoples as being vulnerable constituencies who require state support to protect their ecological context and to manage conflict with other levels of government, external parties and neighbouring communities. Overall Tanzania is still in a colonial and/or socialist paradigm of devaluing cultural diversity. Tanzania has over 120 languages but only allows Swahili and English to



©Nigel Crawhall

Hadza children, Mongo wa Mono, Tanzania

be used in formal schooling. Indigenous and local cultures are often represented in political discourse as 'backwards', 'tribal' and 'divisive'. Development is squarely located in an agricultural paradigm, even when it is evident that agricultural peoples are unable to adequately manage the natural resource base. Overuse of agriculture and constriction of transhumant pastoralism is rapidly leading to the silting of local water sources (such as Lake Manyara), and extensive loss of topsoil and soil productivity.

DURING an exchange visit between Rwandan Batwa Pygmies,⁴ ꞤKhomani San from South Africa and the Hadzabe, the participants acknowledged that the Hadzabe have the strongest cultural and environmental context for inter-generational transmission of knowledge (Crawhall 2004b). If any more powerful group manages to change the ecological or political conditions, it is likely that the Hadzabe would disintegrate rapidly, in a manner seen with many other hunter-gatherer Africans, including the Akie, Aasáx, !lXegwi and others.

IN THE WATER-SCARCE
SOUTHERN KALAHARI
DESERT, SOUTH AFRICA

THE San man draws his knife along the abdomen of the freshly slaughtered sheep. A Nluu speaking grandmother narrates the process into a microphone for the benefit of two linguists. She is only one of twelve speakers of this ancient !Ui-Taa language, a language family that is now almost extinct. The vocabulary comes flowing out: skin, fat, blood, fascia, large intestine, small intestine, gall

⁴ The term 'Pygmy' is used in some countries and found pejorative in others. No offence is intended. Where possible I use the local names which communities use for themselves.

bladder, lungs, heart, heart ventricles, liver, kidney, pancreas, spleen (the linguists stop to confer using their recollections of high school anatomy class, the grandmother continues). Grandmother explains the names of the stomachs and the bowel. All of the food trapped in the digestive track is not conceptually the same. From here to here, we call it *n!ara*, this is food. Below this point, it is *cxan*, faeces. All faecal words in Nluu are marked with this sound 'cx'. However, this is a sheep, not a wild animal, so none of the stomach contents is really food.

IN the western Kalahari dialect of Nluu, the term for 'spiritual power' or 'life force' is *lqe*. All living things are infused with *lqe*, everything from an oryx to a mosquito, from a human to a leaf has *lqe*. Even certain physical sites in the desert have *lqe*, according to !Una Rooi. 'The Nluu word for "ancestor" is the same as "doctor", *!gaexa*. The living look to the dead to help them manage *lqe* for healing. This knowledge is not just intergenerational; it binds together the past, the present and the future. *!Qe* does not belong to us, it is dangerous, and can only be temporarily loaned for healing.' The ꞤKhomani people have used the concept of *lqe*, life force, to help them cope with the AIDS epidemic which reached them after 2000.⁵

ꞤKHOMANI SAN

THE term 'San' is applied to most hunting and gathering peoples of southern Africa, even though they speak different languages and sometimes have quite different cultures. Today, there are about 100,000 San people in southern Africa, from distinct communities using over thirty Khoesan languages from three language families plus several

⁵ See <http://unesdoc.unesco.org/images/0014/001464/146436e.pdf>

Xhara, a Naro elder and shaman, holding a tsamma melon, Nyae Nyae Conservancy, Namibia



isolated language varieties. These groups identify themselves as San, Bushman, Baroa, Basarwa, Ncoakhoe or by local names, such as Jul'hoansi, ꞤKhomani, Haillom, etc. (see Barnard 1992; Hitchcock et al. 2004).

AT the time of contact with Europe, South Africa was populated by San people who spoke languages from the Southern Khoesan language family (also called !Ui-Taa), almost all of these from a single sub-branch known as !Ui. It was these !Ui speaking groups who appear to have been the original occupants of the southern Kalahari and Karoo deserts (Crawhall 2003).

TODAY there is only one !Ui language left, which is Nluu, a language spoken by eleven ꞤKhomani elders living in Siyanda District, Northern Cape Province. Language loss is part of the pattern of the collapse of hunter-gatherer economies, particularly in southern Africa (Crawhall 2005). The larger ꞤKhomani community consists of about 1000 people, mostly speaking Afrikaans

and Khoekhoegowab, the languages of the dominant peoples who migrated into the area.

THE southern Kalahari, a desert region with no surface water some 300 km north of the Orange River, remained relatively out of reach of settlers until the 19th century. From the 1860s onwards Baster and ‘coloured’ (i.e. mixed race) settlers moved into the San territory. There were also !Gorakhoe (Koranas) and Batlharo (Tswana) people along the Orange River with whom the San probably had some interaction. Many San groups were displaced during this period of internal colonisation.

IN the 1920s, the southern Kalahari San were in crisis due to the alienation of land, severe restrictions to their mobility in a fragile desert ecosystem and the famine caused by over-hunting by settlers. In 1931 the government declared a national park on their traditional territory. Lobbying by national parks and settler farmers was able to influence the parliament to suppress recognition of the San as rights holders.

DURING the 1940s the few San still living in the park as labourers were allowed to hunt and gather there as well as assist with conservation and tracking.

All other San were driven out to work as cheap labour on local farms. During apartheid the San who remained in the park experienced increasing degradation and humiliation. Among other things all San people were classified as ‘mixed race’. The few San that remained in the park were expelled in 1972.

IN 1995, the core surviving San group came into contact with a human rights lawyer, who explained the new land laws that gave them the right to restitution for the losses they had experienced since 1913. A land claim was launched with the help of the South African San Institute (SASI) that was successful in 1999. Some 40,000 hectares of land outside the national park has been given to the San. A further 25,000 hectares inside the park was returned to the ǀKhomani San in 2002. The amalgam of different people of San ancestry adopted the name ǀKhomani to represent the identity of their newly reunited community.

DURING the forty years of displacement and abuse, the San lost most of their ancestral languages and major aspects of their traditional knowledge. Their faith system was singled out for destruction by fundamentalist Christian settlers who saw the San ancestor animism (and their languages) as pagan and evil. Most San abandoned not only their faith system but also much of their medicinal and healing knowledge (Crawhall 2004a).

BEING displaced from the land meant that families could not hunt together or gather plants. The state claimed the ownership of all animals, or wildlife became the private property of the settler farmers. The most important practice for learning about biodiversity and ecosystems was made illegal, demonised and persecuted (Skotnes 1996: 274).

WITH the successful 1999 land claim, the ǀKhomani community regained the possibility of being on the land. A number of older people in the community were still highly knowledgeable about animal and bush life. However, the knowledge was fractured and the community dispersed over a wide territory. With the support of the South African San Institute (SASI) and British NGO Open Channels, the leading San environmentalist Karel ‘VetPiet’ Kleinman took up the challenge to teach tracking and ecology to a new generation of San who had grown up in squatter settlements and towns.

THE ǀKhomani are attempting to salvage their knowledge system by creating new forms of education and training. They have the only indigenous run project in Africa for using IKS to train trackers who can get national certification. Similarly, young women are learning oral history and getting qualified as tour guides.

WHEREAS everything would have originally been learned through experientially hunting and gathering, now youth are learning in a mixed format of overt didactic instruction and being on the land with elders. They are becoming ‘literate’ in the educational systems available to them. The motivation is linked to entry into the wage economy reinforced by national certification of their specialised skills.



A traditional ǀKhomani leader, Dawid Kruiper, in Welkom, South Africa

A SMALL VILLAGE IN THE EQUATORIAL RAINFOREST, NORTHERN GABON

Ask the famous Baka healer, Papa Nze, about literacy and education. Are these important for the Baka? Helene Nze translates the question from

French to Baka for Papa Nze, who is partly deaf these days. Helene is one of the few Gabonese Baka who has a high school education and now lives in the city. Papa's family surrounds him in the communal shelter. He considers the question. Papa Nze replies: 'They tell us we should go to school. Reading and writing are useful. The school is far from here. When Baka children go to school far away, then they cannot come back to the forest. They do not

Nze and his family sing polyphonically. They invite the ancestors and forest genes to share some of their ageless wisdom. The chain of learning and knowing crosses from this world through time and space into the world of the ancestors and future generations. The healing can begin. The forest is not a resource for today, it is forever.

BAKOYA, BABONGO & BAKA 'PYGMIES' — GABON

Babongo girls in Digha village, Ilobey commune, Gabon



know the names of things. They do not know where to find food. They do not know about the healing ways. We have a school. The forest is our school, our ancestors are our teachers.'

LATER, conservation managers confirm what we have heard. To be hired as an eco-guard you need a high school leaving certificate to ensure literacy in French. In practice, those with the certificates are lucky if they can name more than three trees in the endless forest. The conservationists prefer if possible to work with so called 'illiterate' Baka who can melt into the forest, with extraordinary skills, stamina and knowledge that turn scientists into children. For the Baka and other indigenous people, the forest is their home, their university, their dispensary, their cathedral and their larder. They know and respect its myriad of secrets.

THAT night an intricate rhythm is tapped out on bamboo poles, hands clap and leg rattles reverberate. Papa

THERE are three major indigenous communities living in Gabon. They are in various stages of being sedentarised by external forces. The Bakoya are mostly settled in villages where they live in 'client' like relations with more dominant Bantu communities. The other two peoples live both in permanent village settlements, but also in the bush, off the road system. The forest Babongo and Baka dress like other rural African peoples, but they live mostly off forest products, including wild meat, honey, fruit, roots and other plants. They sometimes have small manioc and banana gardens under cultivation (for overview see Knight 2003).

THE biggest impact on indigenous peoples has been logging. Gabon's gross domestic product grew strongly over two decades thanks to substantial oil reserves. Now, the oil production of

Gabon is dropping off and the government and private sector are looking for other areas of revenue. One of these is forestry. Gabon is committed to sustainable logging of its equatorial forests. Though selective and sustainable logging is better than clear cutting, it still has a major impact on biodiversity and puts indigenous peoples at risk. Disruption of the canopy of virgin forest alters the light and temperature in the forest, having a major impact on biodiversity. Secondly, Gabon has limited resources to monitor what foreign forestry companies really do.

DURING an IPACC mission to Gabon in March 2005, we listened to testimonies by national parks staff and indigenous peoples about the immense damage done the previous year by a Malaysian logging company. The local people thought that jobs would come with the Malaysian companies. The jobs were few and indigenous people were always last to be considered. The company sliced up the forest, built major roads which accelerated outside commercial hunting and caused erosion and degradation of the forest. When the Malaysians were asked to leave by the government, they allegedly increased their culling of trees, this time also taking out the protected sacred trees of the indigenous people. The Babongo people were traumatised to find sacred trees, resting places of their ancestors and sites of great ritual importance, wiped out by the foreign companies.

THE indigenous peoples in Gabon technically do not have land rights. All forest lands belong to the state, part of the French colonial legacy in Central Africa. They have the right to apply for certain community based conservancies. However, as indigenous people do not hold any positions in local government,

village chiefs are always Bantu. It makes it almost impossible for indigenous people to follow the official channels (see Jackson 2005).

THE creation of the national parks in Gabon and the likely application of World Bank Operational Directive 4.20 (now 4.1), which requires participating countries to develop an Indigenous Peoples Development Plan (IPDP) that addresses the equitable involvement of indigenous peoples in the Forest Environment Sector Programme (FESP), are likely to bring to the surface the unresolved issues of Pygmy access to natural resources and the conservation of their territories (Schmidt-Soltau 2005). Most of the indigenous peoples interviewed by IPACC in 2005 were not clear on where they were allowed to hunt, if at all.

THE Government of Gabon has emphasised the importance of respecting cultural diversity and maintaining rituals and rites, such as the annual hunting of an elephant by Baka to lift mourning for the deceased. Gabon's Government,

in cooperation with WWF and the Wildlife Conservation Society (WCS), is looking at ways in which local communities, including indigenous peoples, can benefit financially from the presence of the national parks. Some options include eco-tourism, guiding, anti-poaching and research assistance. A few Baka have already been employed as forest guides and are involved in gorilla tracking and habituation.

MOST of the indigenous people that IPACC interviewed felt that nature conservation was in keeping with their cultural and spiritual values (see also Posey 1999). They had seen with their own eyes that logging brought much more harm than good. At the same time, Baka people were quite concerned that the regulations around national parks might substantially reduce their rights to the resource base of their livelihoods. Minor access to the cash economy could not be considered adequate compensation. The ability to feed one's family, collect medicine and practice traditional animist rites were all threatened by

the externally imposed principle that nature and people may not coexist in protected areas.

THE manager of WWF in Gabon explained that the goal of the national park process was not to stop people from subsistence hunting and continuing cultural practices. Rather, the aim was to overcome the lucrative poaching of ivory and the uncontrolled logging and mining that were both destroying the environment but also greatly increasing commercial hunters' access to bush meat that was being taken back to the cities for sale.

ALL indicators are that human population increase, weak governance systems, global warming and extractive industries such as logging and mining are posing a grave risk to the forests of the Congo Basin, the second largest continuous forest track on Earth, and one of the most important lungs for the planet. Here would be an ideal opportunity for indigenous peoples, international agencies and African states to work as a team, seeking creative solutions that benefit all parties and the planet.



©Nigel Crawhall

EVERYONE NEEDS TO CHANGE

THE case studies reveal communities in different situations of displacement from natural resources, and the related integrity of knowledge systems. All of them are at risk. The #Khomani lost everything and have a second chance

Baka children eating in a hut, Doumassi village, northern Gabon

Kabuys and Betty Kruiper with family,
Kagga Kamma, South Africa



with a supportive legal and political framework but little help in terms of practical support for IKS management. The key issue is that they recognise that they are holders of knowledge which is a resource they can tap. The Hadzabe are rich in knowledge, a healthy society, but live on a knife edge without much legal security in a fairly hostile political setting. The Baka have more physical security, but there are signs that the forest is going to be cut down and the Baka are becoming sedentary and experiencing knowledge loss and growing poverty.

IN each case, the community is rich in knowledge. Where the community is using natural resources, the IKS is being effectively used, managed and transferred. Where people lose their land tenure or experience displacement, knowledge ceases to transfer and will wither.

IN all cases, the official state policy should be engaging and supporting these communities. All three states are signatories to the Convention on Biological Diversity (CBD). Though Tanzania has some reservations about cultural diversity, it generally encourages local communities to promote protection of the environment. Gabon and South Africa are both countries that affirm and value their cultural and biological diversity.

EVIDENTLY there is a gap — a problem of aligning interests, actions and policies. Part of this problem has to do with the different cultural and economic systems

in which this knowledge of hunter-gatherers is practiced. These are peoples who have not been caught up in the cash and commodity economy to the same degree as dominant peoples. They have the possibility of a sustainable relationship with the natural resource base in their territories. Government planning is often anchored in paradigms that are related to earning incomes, having employment, getting qualifications that will get you that employment, economic growth and unsustainable consumption of resources. The hierarchy of government often excludes hunter-gatherers, sometimes due to ethnic discrimination, but equally due to them 'not fitting in', not having the same opportunities or not having the same qualifications. The Hadzabe are the only community that have managed to embed themselves in some kind of local government.

IN the interviews and workshops I conducted in the course of my work with the Indigenous Peoples of Africa Coordinating Committee (IPACC) I have observed that many of the hunter-gatherers living in or next to protected areas were not aware of national policies on biodiversity. They were not equitable

partners with national parks, they had only a vague idea how the parliament operates and decisions are made about protected areas, and they rarely knew that the United Nations existed or that there were international agreements related to human rights, indigenous peoples or the environment.

EVIDENTLY, in each case, there is a need for greater dialogue between the state and its indigenous citizens. The question is, who is going to facilitate that process? How are two different perceptions about roles and power, different languages and ways of knowing, two different views of nature and natural resources going to be communicated so that they are understandable by bureaucrats and villagers?

UNITED NATIONS' REACTION & ACTIONS

THE United Nations system is primarily a space where member states come together to make decisions and focus on strategies for addressing world problems. As the UN has grown over the last decades, its agencies have taken on a more important role in strengthening good governance by being intermediaries or catalysts for greater communication between citizens and the state, promoting universal standards, and making connections between the civil society and the multilateral system. A number of UN agencies have important functions in relation to threats to the environment and to the custodians of cultural and biological diversity.

THE United Nations has been attempting to promote awareness of indigenous peoples' issues for several decades. In the early 1990s, several events coincided to boost indigenous visibility and

participation in the multilateral system. These included the 'Earth Summit' in Rio de Janeiro in 1992, and the start of the UN's First International Decade of the World's Indigenous Peoples in 1995.

AT the 1992 UN Conference on Environment and Development (UNCED) conservationists and indigenous peoples found each other and realised that they had a common cause. The Rio 'Earth Summit' Conference adopted a number of environmental instruments, guidelines and action plans. Three interlocking conventions were adopted to try to address the grave threats to the environment; these include the Convention on Biological Diversity (CBD), the Convention to Combat Desertification (CCD), and the Framework Convention on Climate Change (FCCC).

THE alliance between indigenous peoples of Latin America and environmentalists ensured that indigenous peoples were recognised as a 'major group' in relation to the Rio Conventions, and the Convention on Biological Diversity (CBD) in particular. The Conventions were supplemented with Agenda 21, a comprehensive plan of action to be taken globally, nationally and locally by United Nations bodies, states and major groups in every area in which human beings impact on the environment. Agenda 21 was refreshed with specific calls for strengthening the role of major stakeholders including indigenous peoples.⁶

OF the three conventions, the CBD is the most explicit about the role of indigenous peoples. The Convention on Biological Diversity includes two articles that promote a partnership to save the planet. Signatory states agree to comply with the following:

⁶ See <http://www.iisd.org/rio+5/agenda/chp26.htm>

ARTICLE 8(j)

Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of benefits arising from the utilisation of such knowledge, innovations and practices.

ARTICLE 10(c)

Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.

THERE has been a strong involvement of indigenous peoples in the work of the 8(j) working group and the Conference of Parties (COP), notably through the work of the International Indigenous Forum on Biodiversity (IIFB). A further document emerged from the CBD that emphasises the most important principle in the protection and management of indigenous IKS — namely that the practice of natural resource usage and management by local and indigenous peoples is the basis for intergenerational transfer of IKS related to biological diversity. This is embodied in the 2004 *Addis Ababa principles and guidelines for the sustainable use of biodiversity*.

TEN years after Rio, the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg re-affirmed and amplified the importance of the partnership between states, conservation agencies and indigenous peoples. The full implementation of Agenda 21, the Programme for Further Implementation of Agenda 21 and the Commitments to the Rio Principles were strongly re-affirmed at the WSSD. The realisation of the importance of involving indigenous

people in all aspects of conservation and defining sustainable strategies hints at the similarity of the forces that are threatening both the world's environments and its first peoples.

THE UNCED/WSSD platforms have highlighted that the survival of indigenous peoples' knowledge systems, cultures, languages and livelihoods are directly related to the protection of the environment and biological diversity, as well as securing and maintaining rights to land and natural resource management.

THE other major agency in the United Nations system dealing with knowledge management is the UN Educational, Scientific and Cultural Organization (UNESCO). UNESCO's General Conference only adopted a framework agreement on cooperation with indigenous peoples once it had started to adopt its normative instruments on cultural diversity. UNESCO is still strongly driven by member state agendas without high level involvement by civil society and indigenous peoples.

IPACC is cooperating with UNESCO's Division for Cultural Policies and Intercultural Dialogue, as well as the inter-division team working on the Decade of Education for Sustainable Development. UNESCO is interested in how participatory cultural mapping can be a tool to help communities engage with the Convention for the Safeguarding of the Intangible Cultural Heritage (2003) and the Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005).⁷

⁷ Two papers related to participatory cultural mapping and modelling were produced by the UNESCO Division on Cultural Policies and Intercultural Dialogue. These are online on the UNESCO Culture website.

THE 2003 convention in particular provides an important interface with the goals of Article 8(j) of the CBD, as well as components of FCCC and CCD. It is possible to link the audit/inventory requirements of the 2003 convention with the IKS auditing/inventory opportunities presented in the CBD and current reports on IKS management.

UNESCO has the benefit of linking education with communications and technology, with cultural policies and science. In February 2006, UNESCO's regional office in Havana, Cuba organised a Latin American conference on the conventions and best practices of cultural inventories of intangible heritage, including the use of cultural mapping. The issues raised in the CBD study of threats and opportunities for TK among indigenous peoples naturally overlaps with state projects stimulated by UNESCO to comply with the 2003 and 2005 conventions as well as the Universal Declaration.

OTHER UN agencies are also influential in Africa. The UN Environment Programme has its headquarters in Nairobi and cooperates with the UN Development Programme to support on the ground projects around the continent.

APPLICATION of indigenous knowledge systems to national development and environmental issues is the greatest resource available to African hunter-gatherers. Most governments which persecute or marginalise hunter-gatherers tend to justify their actions by arguing that this way of life is a backwards activity, embarrassing to modern Africans. They fail to grasp that the IKS is more sophisticated than their national secondary school curriculum, and often more sophisticated than what universities are able to generate — in the

sense that a single hunter is not a single species specialist but a specialist in a range of plant, animal, insect and bird species. They also do not see the modern applications of IKS and how easily it can be supported with Information Communication Technology (ICTs), including geographic information systems and complex data capturing tools such as the Cybertracker.⁸

THE true value of IKS is apparently not evident to African governments. Following interventions at the UN meetings, awareness of the value of IKS seems to be more prevalent in Europe and Japan than it is in Africa — despite Africa having many more diverse intact or semi-intact knowledge systems than other continents. The Republic of South Africa has reacted to the patent claims on *Hoodia gordonii* and is moving rapidly to adopt legislation on access and benefit sharing. However, at the time of preparing this paper there had still been no joint consultation between government departments on identifying traditional knowledge of biodiversity, threats to TK/IKS, or how to interpret and implement Article 8(j) and 10(c) of the CBD.

GREATER communication between CBD, CCD, FCCC, UNEP, UNDP, IFAD, FAO, WHO and UNESCO on the theme of IKS management, protection, assessment, certification/formalisation and its integration into livelihood and conservation projects could shift African decision-makers' opinions. A concerted inter-agency approach could positively influence

⁸ Cybertracker is a combined GPS/palm-pilot technology and software developed by Louis Liebenberg of the Cybertracker Foundation. It allows illiterate yet skilled trackers to capture complex data about animal movements, behaviour, tracks and other elements of biodiversity.

African governments, major conservation agencies and indigenous peoples to the urgent tasks of reversing the decline of African biodiversity IKS, and putting it to work in Africa.

NEW APPROACHES TO POLICY

AT the UN Permanent Forum and in the CBD process, indigenous peoples of the planet have been asserting their rights to their territories, their natural resources, their self-determination and their right to free, prior and informed consent. These are all laudable standards, but in Africa we have a situation where states are reluctant to even recognise indigenous peoples, let alone acknowledge that they are rights-holders.

A more strategic approach to winning over African states may be necessary. The resistance by some African states to recognising indigenous peoples can possibly be circumvented by emphasising that all African TK is a resource in national development and good TK/IKS management can contribute to advancing science, tourism and nature conservation. If the word 'indigenous' is the problem, this can be temporarily put to one side. Traditional knowledge of biodiversity is widespread in Africa, though it is evidently of different complexity and accuracy. If governments can accept that African traditional knowledge systems are a major resource for dealing with environmental threats and creating sustainable livelihoods, then it is a natural progression to recognising that knowledge systems are themselves rooted in ecosystems and livelihoods. The right of indigenous peoples to survive is part of the equation of sustainably using cultural diversity and biodiversity.

PILOT PROJECTS TO PROMOTE IKS USAGE & RECOGNITION

IPACC has been exploring some new partnerships to create forums where indigenous peoples in different sub-regions of Africa can carry out participatory auditing of biodiversity IKS and establish realisable action plans to promote intergenerational transfer.

SOME priorities that have emerged include:

- ◆ IKS competency and skills need to be formally recognised. Currently, only formal schooling is recognised in relation to employment in the conservation/tourism sector or as expert knowledge for research and training. Tracking, spoor identification, plant identification and animal behaviour can all be assessed and certified according to national and international standards. This helps the government and private sector value TK and integrate it more easily into sector planning;
- ◆ Participatory cultural mapping, including 3D modelling, creates opportunities for youth and elders to work together in making tacit intangible knowledge more visible and anchored in the landscape;
- ◆ Youth can use mapping to bridge technology divides — linking IKS to GIS capacity, and in so doing increase recognition and respect from the state, conservation organisations and dominant communities;

- ◆ Elders must be integrally involved with young people in planning how TK can be transmitted, to help set standards for assessment, and to attach their values and wisdom to the application of TK in projects with external partners.

IPACC's partner in participatory 3D modelling is the Centre for Technical Agricultural Cooperation with Rural Areas (CTA). IPACC's partner on the assessment and certification of traditional knowledge of tracking is the Cybertracker Foundation.

Wodaabe dancers, Agadez, Niger



©Nigel Crowhall

CTA funded the Environmental Research Mapping and Information Systems (ERMIS Africa) to help the Ogiek people of Nessuit map their memories of the forest and natural and cultural resources of the Mau Escarpment. The experience has been documented in a number of reports and publications (see Rambaldi et al. 2007). The most significant point is that IKS was degenerating rapidly amongst the Ogiek, directly as a result of the destruction of the forest and their loss of land to unsustainable forestry and encroachment by farmers. The 3D modelling allowed elders and youth to work together, using their own language and intellectual system, to make visible and explicit what otherwise would have been invisible and tacit. A number of indigenous peoples attended the training and there is a lot of interest in how mapping and various participatory methods can be used as media to build a common purpose in indigenous communities in Africa, but also to create GIS maps, models and other tangible platforms for making their knowledge systems easier to

understand for government officials, educators and conservation agencies.

AS Rachel Olson, a First Nations Canadian researcher, noted in the UNESCO workshop on participatory and cultural mapping in November 2006: Native Canadians were once tricked out of their land by not having the same type of literacy as the European colonisers. For Native Canadians today, competence in GIS is part of being indigenous, part of their way of managing their own knowledge and setting the facts straight when dealing with government. Through technology, aboriginal Canadians are empowered to link their IKS with rights and natural resource management systems.

CTA and IPACC are working on a number of Participatory 3D Modelling (P3DM) projects which are targeted at strengthening the mutual understanding between indigenous communities, conservation agencies, ministries of the environment and the school system. This initiative is supported by UNESCO's Division for Cultural Policies and Intercultural Dialogue.

RECYCLING KNOWLEDGE

AN important concept in managing threatened IKS among hunter-gatherers is that of 'recycling knowledge'. If IKS exists in a cultural, ecological and economic context where learning and apprenticeship are tied to the regular and sustainable use of natural resources, then disconnection from the land and economy can spell death for both the community and their IKS.

IN both the case of the ꞤKhomani people of South Africa and the Ogiek of Kenya, the hunting-gathering economy has generally collapsed. Destruction of biodiversity and land alienation means it is difficult for young people, especially those now in urban areas, to spend time in the bush learning the IKS in context.

HOWEVER, this does not mean that the IKS is lost or cannot be recontextualised for a new purpose. The ꞤKhomani community has spent several years looking at how IKS and cultural resources can be documented, shared, and converted into new livelihood opportunities. Oral history and geographic place names were a major resource in their land claim. Now they are using IKS to create jobs in tourism and conservation — mostly related to tracking and guiding. Similarly, though the Ogiek do not appear to hunt and gather regularly, that knowledge system is very much present in the older generation. The P3DM exercise helped expose young Ogiek to the sophistication



Sengwer hut, Kapolet, Western Kenya

©Nigel Crawhall

Acacia erioloba, or !u, on the border of South Africa, Namibia and Botswana

©Nigel Crawhall



of the topological, toponymic, botanic, hydrologic and geographic information existing in their communities.

SUPPORT to indigenous communities, and the all important partnerships with conservation and technology partners, can allow young indigenous peoples to learn IKS from elders and re-apply it in new and useful ways. The value and the shape of the IKS will be transformed by new applications, but it is a much wiser approach than abandoning intellectual and cultural resources in the face of discrimination and marginalisation.

FORMALISING IKS RECOGNITION

IN southern Africa, the IPACC network is emphasising the issue of formalising/certifying certain types of indigenous knowledge. Tracking, for example, is both a traditional skill and an employable profession. Currently, it is easier for people of European descent to get certified as there is a bias towards people with wealth and education. However, Louis Liebenberg, of the Cybertracker Conservation, has demonstrated that talented traditionally-educated San trackers tend to have higher skill levels and a broader base of knowledge than some senior non-indigenous trackers. Reliable assessment of IKS, in this case tracking, helps render visible the complexity of both knowledge and skills, and makes the indigenous standards the norm for certification.

AFRICAN governments are not generating assessment and certification methods for IKS. They are struggling with existing formal education delivery, let alone important reforms to merge African knowledge systems with schooling. Considering the southern African situation, which is similar to East and Central Africa, governments are willing to let the civil society and the private sector come up with the assessment protocols and standards for certification. They still need to be lobbied to even understand that formalising IKS is a step in the right direction.

ONE example of where certification and formalisation could have a transformative impact is in protected areas. Indigenous peoples in Africa struggle to be employed in national parks, even when they evidently have higher competence in species identification, tracking, spoor recognition, understanding of animal behaviour and so forth. Usually the problem is that the indigenous youth do not have high school leaving diplomas. National parks and major conservation agencies rely on

standard high-school leaving certificates to establish the competence of their employees. This habit can be reversed by creating assessment standards which emphasise real knowledge and skills related to biodiversity rather than basic literacy and irrelevant school certificates. African bureaucrats have a general idea of what IKS involves, but in terms of legislation and the public service standards, they need IKS to be measurable and certifiable before they can convert this into equivalences worthy of employment.

IN September 2006, IPACC cooperated with Cybertracker Conservation and WWF Namibia to run a workshop on the assessment and certification of the traditional knowledge of tracking. San trackers from three countries attended the workshop in a bush camp in Nyae Nyae Conservancy, outside Tsumkwe, Namibia (IPACC 2007). The workshop was opened by the Namibian Deputy Minister of the Environment and Tourism, who emphasised the importance of local initiatives to conserve knowledge

Ogiek men mapping their cultural landscape, Nessuit, Kenya



and help apply it in protecting the environment, and creating new livelihoods through conservation and tourism. The Tsumkwe workshop concluded that San people need to have more inter-generational dialogue about knowledge transfer, and that young people need partnerships with NGOs to convert traditional knowledge into recognised qualifications to create jobs and have more of a role in managing their traditional territories. CBD and CCD with support from the Global Environment Facility (GEF) are creating new opportunities for cooperation between the state, the private sector, communities and conservation agencies.

ROLE OF CONSERVATION AGENCIES

ONE of Africa's great resources in the 21st century is its biodiversity and national parks. National parks generate important tourism revenue and a forum for north-south exchange of skills and resources. Developed countries of the north are willing to make some resources available to help Africa conserve these complex and vulnerable spaces. Almost all African governments recognise the growing value of protected areas.

THERE are many conservation agencies in Africa, both local and international. They have different styles of management and reputations. Overall, the history of indigenous peoples,

protected areas and conservation agencies is fairly negative. Indigenous peoples have been expelled from or had their rights seriously reduced in some of the most famous national parks on the continent: the Hailom from Etosha; the Naro, !Gwi and !lGana from Central Kalahari Game Reserve; the ǀKhomani and !Kung from Kalahari Gemsbok Parks; the Maasai and Barabaig from Serengeti and Ngorongoro, and the Batwa from most of the parks in the Great Lakes including the Bwindi Impenetrable Forest, Parc National des Volcans, Virunga National Park, Kahuzi-Biéga, Nyungwe and Kagera National Parks (See Jackson 2005). This is not counting all of the other local peoples who have been dispossessed. Indigenous peoples, due to their low social status and limited formal education are almost completely excluded from any future relationship with the parks system.

THERE are counter-examples, and Africa has been at the forefront of exploring

cooperative relationships between protected areas and local peoples. The most well documented of these was the Campfire Programme in Zimbabwe which created financial incentives for conservation. A quieter but more sustainable effort has been made by Namibia with its community based conservancies which include three conservancies on San lands which benefit these communities while allowing them to continue hunting.

THE winds of change were expressed at the 5th World Parks Congress in 2003, in Durban, South Africa, where delegates affirmed a new vision of partnerships around national parks. The IUCN World Conservation Congress in Bangkok in 2004, adopted Resolution 081, which included the following wording (IUCN 2004):

IN recalling the outcomes of the World Parks Congress, the resolution takes account of the fact that at the Vth World Parks Congress held in Durban, South Africa 2003 the Congress inter alia:

- ◆ Adopted a new paradigm on protected areas that respects indigenous rights;
- ◆ Called on the CBD to ensure that indigenous peoples fully participate in the establishment and management of protected areas;
- ◆ Called a halt to forced resettlement and involuntary sedentarisation of indigenous peoples without their free prior and informed consent;
- ◆ Encouraged national reviews of innovative governance for protected areas;
- ◆ Called for participatory mechanisms for the restitution of indigenous lands that were incorporated into protected areas without their free, prior and informed consent, by 2010;
- ◆ Urged the setting up of a Truth and Reconciliation Commission on Indigenous Peoples and protected areas.'

IUCN has also recommended to the Conference of Parties (COP) of the CBD that it endorse the proposed *Akwé: Kon voluntary guidelines for the conduct of cultural, environmental, and social impact assessment regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities* (IUCN 2004).

EVIDENTLY, the major NGOs dealing with nature conservation and protected areas have come to recognise that their work takes place in an economic, historical and social context. A rights based approach to development

is increasingly informing the Western world's engagement with Africa. Yet, it is not clear that a rights based approach is adequate to transform relations between hunter-gatherers and the central state, not to mention the global economic markets and multinational companies extracting resources from Africa.

THE daily life of hunter-gatherers in relation to national parks remains one of anxiety, dispossession, humiliation and uncertainty. To summarise IPACC's experience in Africa: the less formal (and remote) the conservation arrangements, the better for the local people but the more vulnerable to outside encroachment; the more formalised the protected area arrangements the less accessible to indigenous peoples. This is something which needs serious attention by the conservation agencies. They are weakening their own ability to monitor biodiversity by displacing hunter-gatherers from their own territories and/or treating them as if they are ignorant.

CONCLUSION: FACILITATING INTERCULTURAL DIALOGUE

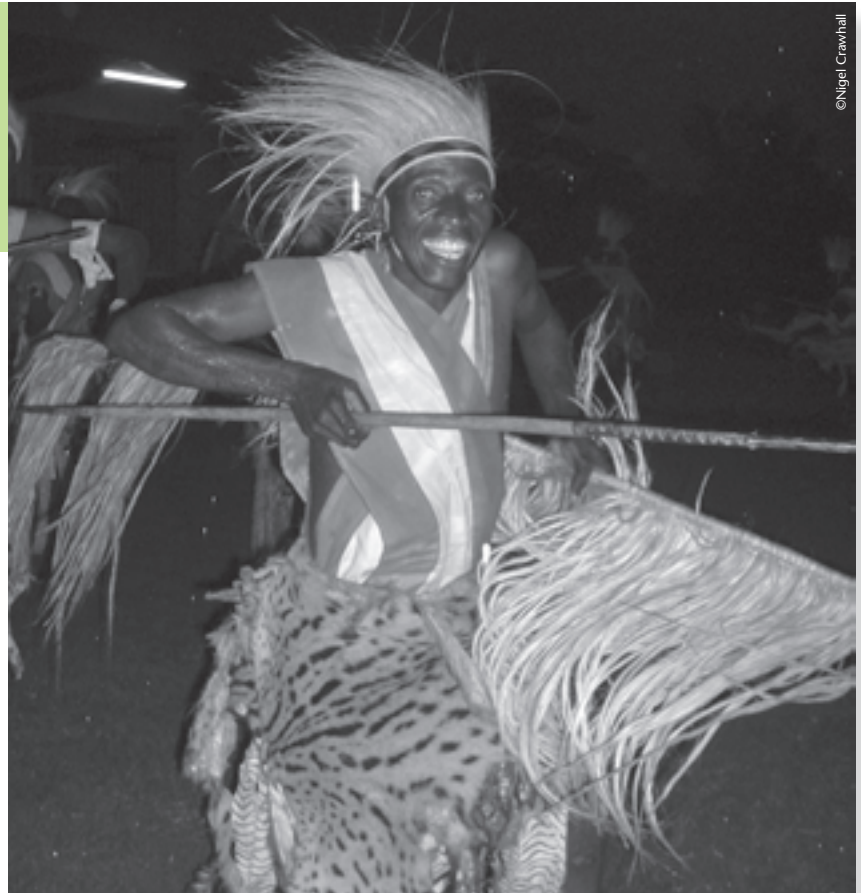
HUNTER-GATHERER peoples have been rendered vulnerable due to environmental changes and political marginalisation. Unsustainable expansion of agriculture into forests and arid lands has destroyed the biodiversity necessary for hunter-gatherers and now the commercial extraction of natural resources. Colonialism structurally marginalised hunter-gatherers by concentrating on integrating food producing peoples into the education system, modern economy and state bureaucracy. Today, the state is overtly or passively contributing to the reduction of biodiversity and consequently cultural diversity.

WITHOUT concerted interventions and a paradigm shift, we can predict that hunter-gatherer economies will all eventually collapse and the sophisticated knowledge held by the elders of these communities will die out with them. It is clearly not in the interest of the planet to eradicate IKS that was born in bio-diverse ecosystems and would be a vital resource in monitoring and conserving natural resources. Yet, it is not clear who will create the platforms to change the perceptions and relations between states and hunter-gatherer peoples, and between conservation agencies and indigenous peoples.

THE first UN International Decade on the Rights of Indigenous Peoples placed most of its emphasis on human and civil rights of indigenous peoples. Though human rights is an important and ongoing process, it needs to be recognised that this topic is not of much interest to the powerful consumers of resources in Africa. Saugestad (2001) argues that the Botswana state is not inherently undemocratic or opposed to human rights, it is rather that the 'problem' of the San sits outside the elites' paradigm of governance and development, and thus becomes 'inconvenient'.

GLOBALISATION, it can be argued, weakens the state's ability to protect its citizenry from abuses by industries, particularly in remote rural areas and with endemic corruption. Hunter-gatherers are small minorities that are not usually even acknowledged as distinct people within the country. They have no political voice, and they sit typically in fragile ecological systems. Focusing purely on human rights claims against the state is not necessarily going to be effective in changing the current trend of land degradation, displacement, poverty and cultural disintegration.

Mutwa dancer, Bujumbura, Burundi



©Nigel Crawhall

THERE are other international instruments which provide opportunities for indigenous peoples to connect with the multilateral system, and use this at home to strengthen new types of partnerships and visibility. Policies, standards and mechanisms that govern the use of natural resources and protected areas can also provide new hope and opportunities for indigenous peoples. They also hold new threats. Commoditisation and privatisation of land threatens African holistic concepts of collective natural resource management. Indigenous peoples should be able to rely on alliances with African national parks, but thus far environmentalists have been slow to act on this partnership. There is, arguably, a conflict of paradigms in the communication between indigenous peoples and conservationists.

MORE attention to intercultural dialogue between indigenous peoples, conservationists, UN agencies and government officials could help focus attention on the strong mutual interest that is present when considering the sustainable management of biological diversity. Greater interaction between the state, indigenous peoples, the multilateral system and the conservation NGOs means each can understand the other better, and checks and balances can be put in place.

UN agencies are uniquely placed to bring indigenous peoples from the physical and conceptual periphery of the world to the centre stage of action for

keeping the planet intact. Indigenous peoples bring knowledge, but they also bring a value system and an equilibrium oriented paradigm for sustainable development that needs to be considered side-by-side with globalist models of growth and trade-centric development.

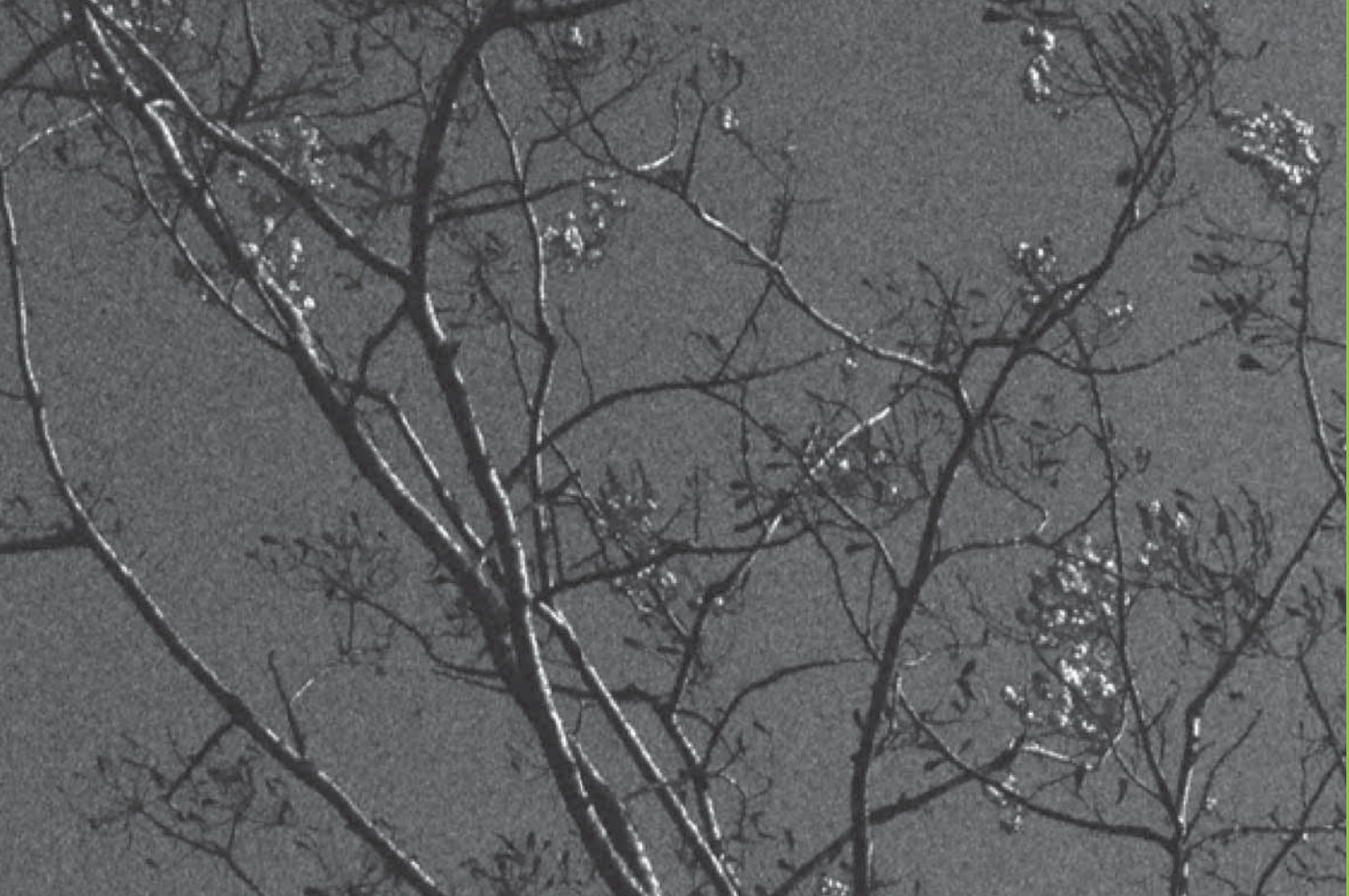
THE combination of programming efforts from UNDP, CBD, UNEP, IFAD, FAO, UNESCO and other UN agencies could play a major role in encouraging African states to value IKS and give more attention to local and indigenous peoples' cultures and strategies for sustainability.

PILOT projects which explore how tacit and intangible knowledge can be surfaced and made visible through technology are one way of creating

platforms for greater intercultural dialogue. The other theme to be explored is the formalisation, assessment and accreditation of IKS to make it measurable and sufficient to secure employment and status as 'experts'. The quid pro quo making indigenous IKS more accessible to the state and other external actors is that states are obliged to recognise that indigenous peoples are important partners, as well as rights-holders, and that new forms of tenure (hybridised from traditional African systems) are articulated to ensure indigenous peoples' natural resource security in perpetuity. Economies will change, biodiversity will change — but reinforcing local and indigenous custodianship will help make old knowledge valuable and accessible for future generations.

REFERENCES

- Bahuchet, S.** and Guillaume, H. 1982. Aka-farmer relations in the Northwest Congo Basin. In Leacock, E. and Lee, R. (eds.), *Politics and History in Band Societies*. Cambridge, Cambridge University Press. Pp. 189–211.
- Barnard, A.** 1992. *Hunters and Herders of Southern Africa: A Comparative Ethnography of the Khoisan Peoples*. Cambridge, Cambridge University Press.
- Biesele, M.** 1993. *Women like Meat: The folklore and foraging ideology of the Kalahari Ju/'hoan*. Johannesburg, Witwatersrand University Press.
- Crawhall, N.** 2001. *Written in the Sand: Auditing and Managing Cultural Resources with Displaced Indigenous Peoples: A South African Case Study*. Cape Town, South African San Institute and UNESCO.
- Crawhall, N.** 2003. Recovering land and language in the southern Kalahari. In Blythe, J. and McKenna Brown, R. (eds.), *Maintaining the Links: Language, Identity and the Land*. Proceedings of the seventh conference presented by the Foundation for Endangered Languages. Broome, Western Australia. 22nd – 24th September 2003. Bath, Foundation for Endangered Languages.
- Crawhall, N.** 2004a. *!Ui-Taa Language Shift in Gordonian and Postmasburg Districts, South Africa*. Ph.D. thesis, University of Cape Town, South Africa.
- Crawhall, N.** 2004b. African Indigenous Peoples' Workshop on Traditional Knowledge, Identity and Livelihoods. Cape Town, IPACC.
- Crawhall, N.** 2005. The Story of !Ui: Causality and Language Shift in Africa. Proceedings of the IX FEL Conference (Stellenbosch, South Africa), *Creating Outsiders: Endangered Languages, Migration and Marginalisation*. Bath, FEL.
- Diamond, J.** 1997. *Guns, Germs and Steel: A Short History of Everybody for the last 13,000 Years*. London, Vintage.
- Dimmendaal, G.** 1989. On language death in eastern Africa. In N. Dorian (ed.), *Investigating Obsolescence: Studies in Language Contraction and Death*. Cambridge, Cambridge University Press. Pp. 13–31.
- Hitchcock, R.** and D. Vinding. 2004. *Indigenous Peoples' Rights in Southern Africa*. Copenhagen, IWGIA.
- IPACC.** 2007. *IPACC Southern African Regional Workshop on the Formalisation of the Traditional Knowledge of Tracking*. Cape Town, IPACC.
- IUCN.** 2004. Resolution 081, World Conservation Congress, Bangkok, Thailand, 2004. www.iucn.org.
- Jackson, D.** 2005. Implementation of International Commitments on Traditional Forest-Related Knowledge: Indigenous Peoples' Experiences in Central Africa. In Newing, H. (ed.), *Our Knowledge for Our Survival: Traditional Forest Related Knowledge and the Implementation of Related International Commitments*, Vol. 1. Chiang Mai, IAITPTF. Pp.151–303.
- Knight, A.,** Underhill, P.A., Mortensen, H.M., Zhivotovsky, L.A., Lin, A.A., Henn, B.M., Louis, D., Ruhlen, M. and Mountain, J.L. 2003. African Y chromosome and mtDNA divergence provides insight into the history of click languages. *Current Biology*, 13:464–473.
- Knight, J.** 2003. Relocated to the Roadside: Preliminary Observations on the Forest Peoples of Gabon. *African Study Monographs*, Suppl. 28:81–121, November.
- Leacock, L** and Lee, R. 1982. *Politics and history in band societies*. Cambridge, Cambridge University Press.
- Lee, R.** 2003. *The Dobe Ju/'hoansi. Case Studies in Cultural Anthropology*. Toronto: Thomson Learning. 3rd. Edition.
- Madsen, A.** 2000. *The Hadzabe of Tanzania: Land and Human Rights for a Hunter-gatherer Community*. Copenhagen, IWGIA.
- Posey, D.** (ed.). 1999. *Cultural and Spiritual Values of Biodiversity*. London/Nairobi, Intermediate Technology Publications/UNEP.
- Rambaldi, G.,** Muchemi, J., Crawhall, N. and Monaci L. 2007. Through the Eyes of Hunter-gatherers: Participatory 3D Modelling among Ogiek Indigenous Peoples. *Information Development*. Vol 23, May.
- Ridington, R.** 1978. *Hunting and Gathering World View in Relation to Adaptive Strategy*. Paper presented at the First International Conference on Hunting–Gathering Societies. Paris.
- Sands, B.** 1998. Eastern and Southern African Khoisan: evaluating claims of distant linguistic relationship. *Quellen zur Khoisan-Forschung*, 14. Cologne: Rüdiger Köppe.
- Saugestad, S.** 2001. *The Inconvenient Indigenous: Remote Area Development in Botswana, Donor Assistance and the First People of the Kalahari*. Nordic Africa Institute.
- Schmidt-Soltau, K.** 2005. *Plan de Développement des Peuples Autochtones. Programme Sectoriel Forêts et Environnement*. Libreville, Ministère de l'Economie Forestière, des Eaux, de la Pêche, de l'Environnement chargé de la Protection de la Nature.
- Secretariat** for the Convention on Biological Diversity. 2004. *Akwé: Kon Voluntary Guidelines For The Conduct Of Cultural, Environmental, And Social Impact Assessment Regarding Developments Proposed To Take Place On, Or Which Are Likely To Impact On, Sacred Sites And On Lands And Waters Traditionally Occupied Or Used By Indigenous And Local Communities*.
- Skotnes, P.** (ed.). 1996. *Miscast: Negotiating the Presence of the Bushmen*. Cape Town, University of Cape Town.
- Woodburn, J.** 1997. Indigenous discrimination: the ideological basis for local discrimination against hunter-gatherer minorities in sub-Saharan Africa. *Ethnic and Racial Studies*, Vol. 20, No. 2, April.



The loss of their specialised knowledge of nature is a grave concern for many indigenous communities throughout the world. Education, as it is understood in a Western context, occupies a pivotal role in this process, highlighted by many as both a major cause of the decline of indigenous knowledge, and also as a potential remedy for its demise. Commendable

efforts are being made to better align educational curricula with indigenous realities and to incorporate local knowledge and language content into school curricula, but the interrelationship and balance between these two different ways of learning remain delicate. These issues, and attempts to address them, are explored within this book.



United Nations
Educational, Scientific and
Cultural Organization

Natural Sciences Sector
Local and Indigenous Knowledge Systems Programme
Culture Sector
Intangible Heritage Section
Division of Cultural Policies and Intercultural Dialogue