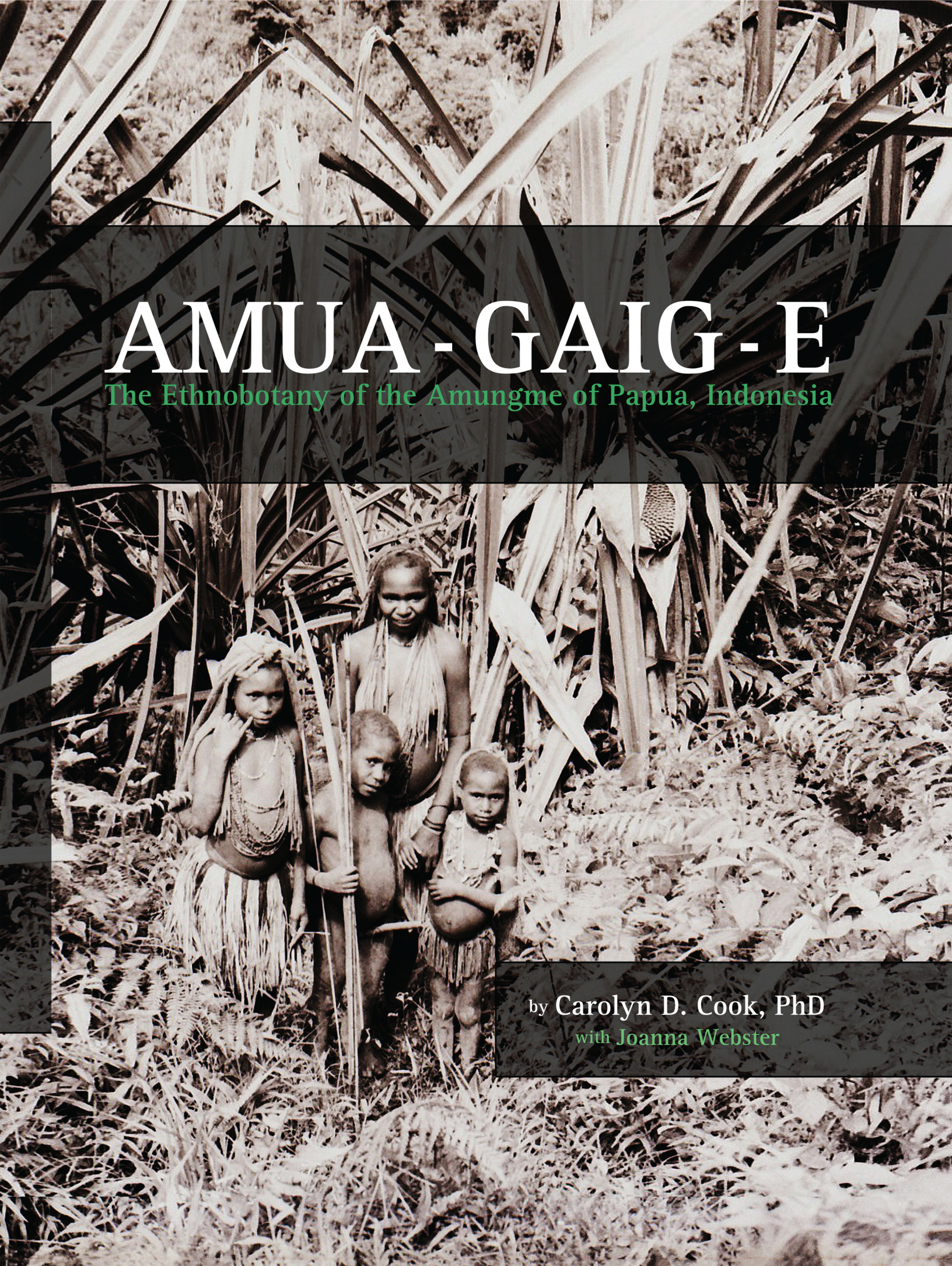


AMUA-GAIG-E

The Ethnobotany of the Amungme of Papua, Indonesia

by Carolyn D. Cook, PhD
with Joanna Webster

AMUA-GAIG-E

The Ethnobotany of the Amungme of Papua, Indonesia

AMUA-GAIG-E

The Ethnobotany of the Amungme of Papua, Indonesia

Carolyn D. Cook, PhD
with Joanna Webster

Canadian Science Publishing, Ottawa, K2E 7W6

Printed in Canada
First edition

ISBN: 978-1-927346-21-1

Library and Archives Canada Cataloguing in Publication

Cook, Carolyn D., 1945-, author AMUA-GAIG-E : the ethnobotany of the Amungme of Papua, Indonesia / Carolyn D. Cook, PhD ; with Joanna Webster.

Includes bibliographical references and index.
ISBN 978-1-927346-21-1 (bound)

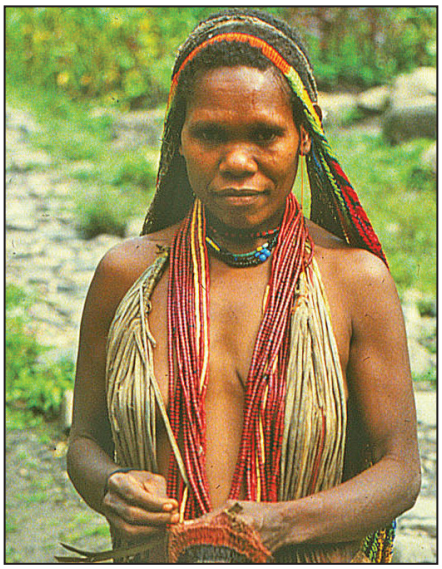
1. Uhunduni (Indonesian people)--Ethnobotany. 2. Ethnobotany--Indonesia--Papua. I. Webster, Joanna N., 1976-, author II. Title.

DU744.35.U36C65 2016 581.6'30899912 C2015-908291-9

Correct citation for this publication:
Cook, C.D. and Webster, J. 2016. Amua-gaig-e. The ethnobotany of the Amungme of Papua, Indonesia. Ottawa, ON: Canadian Science Publishing.

Dedication

This book is dedicated to the memory of Jutak Amonkoame, a beloved Amungme friend who contributed much knowledge to this book, as well as a cheerful attitude toward his fellows, and an eagerness to both embrace new ideas and preserve the wisdom of his elders.



And, to Tamok Magal, a faithful assistant who worked with me every day during my research time in Beanegogom, Tsinga Valley. She (and her brother, Tony) taught me a great deal about their plants and how the Amungme interact with the environment.

Preface

In the last half-century, the Papuan Highlanders known as the Amungme have faced change in their world that would be unfathomable to most. Twelve remote valleys on the southern slopes of the Jayawijaya Mountain Range in the Indonesian province of Papua (the western half of the island of New Guinea) are their traditional homeland, which they call Amungsa. Historically, the Amungme have sustained their life in the New Guinea Highlands with a combination of subsistence horticulture, pig husbandry, and hunting and gathering. Their way of life there has evolved from one of complete self-sufficiency and almost total isolation that existed up until the 1950s, to a life today—only a couple of generations later—that is a complex web of both traditional cultural practices and attempts to participate in a global industrialized economy and societal melting pot that operates on their doorstep.

There is no evidence, either documentary or in Amungme oral history, of any significant external contact before 1910 (Ballard et al. 2001). From about this time, the Amungme began receiving steel and iron goods, such as axe blades, from trading partners to the west and from the Kamoro and Sempan people to the south. After brief contact with the exploration expeditions of Wollaston in 1912 and Colijn in 1936, the Amungme remained relatively isolated until both Protestant and Catholic missionary activity began in the area in the 1950s. The first missionary in Amungsa was Mickelson, an American evangelist, who trekked through the region with a Dutch agricultural official in 1950 (Muller and Omabak 2008). The Amungme were receptive to Christianity within a context formed by their traditional belief system, which focuses on the concept of *hai*. As Ballard (1997) put it: "*Hai* is a fundamental sense of the promise of well-being that informs all aspects of Amungme life and spirituality and is not unlike the promise of other religions."

In the early 1960s, the Dutch (who at the time governed over the western half of the island) and the Roman Catholic Church tried to help the Amungme through an assisted move from Amungsa to Agimuga on the southern coast where it was thought they would have easier access to the school system and employment in rubber plantations. Just as this migration was taking place in 1963, Dutch New Guinea officially became part of the Republic of Indonesia. The new Indonesian government, with less experience in the region and far fewer resources at its disposal, was poorly equipped to support the migration project, and the Amungme hope for a better life in the lowlands began to fade. About half of the Amungme population in the Noemba, Tsinga, Wa, Hoea, and Aroanop valleys did migrate, but about half of those returned to the mountains due to the overwhelming heat and prevalence of malaria (from which many died) in the coastal lowlands.

In 1967, development of PT Freeport Indonesia (PTFI) mining operations commenced in Amungsa. With the development of the mine and its camp township, Tembagapura, to house workers in the Wa Valley, came money, jobs, food, medicine, foreign and other Indonesian workers, and Papuans from other groups and areas looking to capitalize on the opportunities presented by the mine. Competition for these opportunities and resources resulted in inter- and intra-tribal conflicts, pressures for land and food, and a blurring of the delineations of land tenure (particularly in the Amungme villages closest to the mining operations).

While the PTFI mining operations played the largest influential role in Amungme lives from 1967 through approximately 2000, I also saw the influence of the Indonesian Government and Indonesian migrants from other parts of the country increase rapidly with the dawn of the new millennium and increasing settlement and development in the coastal lowlands to the south.

The lowlands township of Timika, which developed following PTFI's construction of an airport to support the mining operation, has boomed with migrant population growth and unchecked infrastructure development over the last 35 years. As Timika grew, interest in the nearby mineral resources grew, and in the early 2000s, illegal gold panning in the river system south of the mining operations began. Papuans from other groups, as well as members of the Indonesian military stationed in the region, moved into the area of Utekini in the Wa Valley. The Amungme tried unsuccessfully to oust the gold panners from Utekini, but when their efforts failed, many of the Amungme joined the panning operations, selling the gold (through a network of traders that fed the Timika gold market) to increase their cash income. Timika, having now become an urban center offering access to temptations, such as prostitution and alcohol, has provided a distraction for Amungme men from both the mine and their villages, as well as a place to spend the money received from PTFI employment, the Government of Indonesia, or from gold panning.

Today, life in many of the Amungme villages is disrupted by the migration of men and older boys out of their clan lands to the areas where they hope to access education and work opportunities, or to indulge in taboo activities away from the disapproving eyes of their families and the shackles of their traditional social customs. This migration out of the villages has resulted in fragmentation of clans and families, and has left an unbalanced population in the villages of mostly women, children, and men too old to do much physical work. The traditional division of labor has become blurred as women take on more work that was previously in the domain of men's responsibilities. These women have limited amounts of energy, which means smaller areas of land are being used to grow the traditional food crops of sweet potato and taro. Although men try to return home periodically to plant or harvest taro and attend to some work that needs to be done, it is not nearly the help that the women need to keep their gardens going. This imbalance in manpower in the Amungme villages has resulted in reduced implementation of traditional food growing practices and decreased food production, directly reducing the ability of the Amungme to sustain their own food requirements independently.

The rapid growth of Timika and its booming economy, the development of new businesses, the financial gain from employment salaries, and the implementation of community development programs as part of the distribution of mining operation profits to the Amungme as the traditional land owners, have provided the Amungme with measurable benefits. However, they have also increased the Amungme dependence on imported, non-traditional foods (e.g., rice provided through the government food subsidy program), fuel, transport (both ground and air), building materials, and medical care from outside their homeland, and have decreased their implementation of self-sufficient living practices. Many of the men now living and/or working outside Amungsa send in supplies (such as rice, cooking oil, instant noodles, and salt) and money to buy other goods that are transported to the villages. While some Amungme successfully gain employment outside their villages, many still have limited access to consistently available education opportunities (despite the efforts of community development programs to improve access to

education), and most Amungme are still not adequately equipped to compete effectively with other Indonesians and expatriates for skilled jobs. The introduction of monetary currency and a global economy has resulted over time in gross inflation and imbalance within the traditional Amungme economy, which focuses on a network of bride payments and debts in the form of pigs, traditional objects, and now also money.[1] This has further contributed to tension and conflict within and between Amungme clans and other Papuan groups.

The Amungme, and the complex challenges they have faced in the rapidly changing world around them, have shaped much of my life for the last 35 years. I am not an objective observer. I have been with the Amungme through the celebrations of their marriages and births of their babies, their fights between clans and fragmentation of their families, the loss of their children, the deaths of several of the men from AIDS, and the burial of their elders. I lived with them, I loved them, and this book is the culmination of much of what I learned from them.

My family moved to Tembagapura, Papua, in 1977 when my former husband, Wayne Cook, accepted an engineering job at the PTFI mine. I quickly became intrigued by the local Papuan people who lived in the Wa Valley around Tembagapura. At that time, a few of these Amungme could speak Bahasa Indonesia, but none could speak English. My first and ongoing task was to learn the Indonesian language, which I did by studying with a series of private teachers for the first seven years, and later completing a four-year Indonesian language program at the University of Hawaii.

I first learned some of the Amungme customs by talking with missionaries and priests and spending time in their villages. During my first seven years in Papua, I led a group of expatriate women to interact with the Amungme women in Wa village on a regular basis, helping with literacy as they learned to read their own language in Bible stories, as well as cooking, health, and sewing. We also worked with the women who had relocated from Noemba and Tsinga to Timika (via the Dutch transmigration project to Agimuga). Although I studied the Amungme language, Amungkal, over the years with some Amungme, I never became proficiently fluent in their language. I knew a lot of phrases and words that I needed for everyday life and this was rounded out with the help of Indonesian-speaking Amungme.

Upon leaving Tembagapura in 1984, I embarked on improving my own formal education in disciplines that would enable me to return and work with the Amungme. My bachelor of science degree at the University of Idaho focused on agriculture and botany. I had completed three years of this degree prior to leaving for Indonesia and finished it in 1985. At Washington State University, I received a master of arts degree in anthropology in 1988. This phase of my studies focused on tribal peoples and international development, and my thesis was based on research material I gathered in Timika in 1985 and 1986. In the early 1990s, I began studies for a doctorate of philosophy in anthropology at the University of Hawaii. During this time, I also studied tropical agro-forestry and Indonesian language, and was a fellow in the Environment and Policy Program (from 1990 to 1995) at the East-West Center in Manoa, Hawaii. In 1992, I returned to Papua, hiking into the Tsinga Valley to spend

[1] In mid-2013, the cost of a large pig in Amungsa was seven million Indonesian Rupiah, which equals about US$ 740.00. In comparison, the price of rice was a little less than $US 1.00/kg at that time. Pigs are also used on special occasions, such as traditional spirit appeasement ceremonies, funerals, new building dedications, and holidays.

a year living in isolation with the Amungme clans of that valley, studying and documenting their culture, ways of life, ethnobotany, and agricultural practices. With this research, I received my PhD in 1995.

In 1996, I designed and supervised a project with the Amungme and Universitas Negeri Papua (UNIPA) with the support of the National Science Foundation, to collect and document the variety, knowledge, and use of pandanus trees in the Amungme territory. During 1997, I worked with the Australian National University helping to conduct a baseline study of the Amungme people for PT Freeport Indonesia and Lembaga Masyarakat Amungme (LEMASA), the Amungme Community Organization (more commonly referred to as the Amungme traditional tribal council). From 1997 through 2000, I assisted a team of Royal Botanic Gardens, Kew botanists sponsored by PTFI and Rio Tinto to conduct annual botanical surveys and collections in the mining operation's Contract of Work area, sharing information regarding plants in the area.

Although I had been back living in the region since 1996 working on projects with the Amungme and several other organizations, I began working directly for PTFI in 1998. Under PTFI's department of Social Outreach and Local Development, I designed and implemented a major project with the Amungme of the Wa Valley to turn the area of Utekini (below Tembapagura, at the junction of the Aghawagon and Uteki Rivers) into orchards and vegetable gardens producing both traditional Amungme crops and newly introduced crops that could provide both food and income for the Amungme. I had long advocated planting more nut pandanus (*P. julianettii*) as both a food security crop and a cash crop, and finally had the opportunity to try this with the Amungme at Utekini. In addition, we planted many kinds of trees and short-term vegetable crops—some for fertilizer and some for food—as well as coffee to provide a new source of income. It was to be a project that incorporated a traditional way of life while teaching new elements of marketing and sales to provide them with an additional avenue to integrate with the monetary economy operating in parallel with their own.

The first year of the Utekini project was both challenging and rewarding. The Amungme were supportive of the project and the potential benefits it offered them, but the concept of working each day within scheduled hours was a foreign concept to many of them. I heard all of their reasons for not coming to work, and it made me realize that their old belief system and economic system were still strongly intact, despite the presence and lure of the 'modern world' that they were trying to embrace. However, illegal gold panning activities in the nearby Aghawagon River quickly plagued our agricultural project, with problems stemming from the influx of panners to Utekini and the Wa Valley. We persevered until 2005 when we deemed it wise to relocate the project's organizational base to the lowlands and only continue agricultural work within outlying Amungsa valleys. Thirty years after my journey in Papua began, I left permanently in 2007, only returning briefly in 2013 while working on research for this book.

With the rapid changes faced in their homeland of Amungsa and the loss of their traditional self-sustaining agricultural practices, it is my fear that the Amungme will not be able to survive as a cohesive community and a culture when the mining reserves in the area are exhausted and the economic support it now provides diminishes.[2] In writing this book, I hope to provide the Amungme, and others who live in their traditional homeland valleys and work with them, with a legacy of information of what the Amungme know (or knew) about their

highland environment, and how they interacted with it to create a life for themselves that may not have been ideal, yet promoted self-reliance, biodiversity, sustainability, and a healthy and varied diet.

Preserving this knowledge I hope will help to buffer the Amungme against the uncertainty of their future living in the Jayawijaya Mountain Range of Papua. As a record of the plants that the Amungme use(d) for food, medicine, building, and other purposes, as well as their traditional agricultural, cooking, and building practices, this book aims to be a resource for future generations of Amungme—providing them with a vision into their past and heritage, and offering them a path towards self-reliance again, to enable them to continue to live in the rugged and challenging environment of their traditional homeland.

Amungme knowledge and application of plants recorded in this book also has potential to be of use beyond Amungsa. It is the only broad-scope documented study of the plants of the southern montane slopes of the Jayawijaya Mountain Range, as they are used by the Amungme, other than a series of short booklets produced for PTFI on the sub-alpine and alpine plants (Shea, Sarosa, and Uamang 2000; Shea, Sarosa, and Zongganau 2000a-d). Around the world, scientists are advocating and conducting preservation of indigenous knowledge such as this, which is in danger of disappearing with the present generation of elders (Nations and Nigh 1980; Johannes 1981; Hunn 1999). If we view traditional environmental knowledge as sound science, then it can be used to complement the research and findings of Western science. With the world constantly in search of 'new medicines' to combat serious diseases, 'new foods' that provide high nutritional value and also have the potential to fight disease, as well as other 'new plants' that can be cropped to enrich and preserve soil, the ethnobotany of the Amungme, as described in this book, has the potential to reveal opportunities to researchers globally to identify such medicines, superfoods, and ameliorating crops.

This book is not a traditional botanical identification reference book. It is meant to be a record of the plants used by the Amungme, the purposes fulfilled by the plants, and the ways in which they are collected, planted, grown, harvested, eaten, used for building and medicine, as well as the ways they are interpreted into the Amungme oral history, culture, tradition, and spirituality. It has been written predominantly for the Amungme and for those who work directly with them, and as such has been written in a more relaxed and accessible style than a traditional botanical reference book, to form a practical guide to their ways of life.

Wherever possible, plants have been examined and identified to at least the genus level (with Latin names provided). However, not all plants have been fully identified in botanical terms. As such, the book has not been organized taxonomically or alphabetically like a traditional botanical reference, but has been organized in terms of their management, use, and importance to the Amungme, as I interpreted by observing frequency of use and amounts used. Amungkal names are provided for almost all plants (except in only a couple of instances where the Amungme had forgotten the name of a particular plant). If the Amungkal plant names have been previously written then that spelling is used, but in many cases, Amungkal plant names have not previously been included

[2] PTFI's existing Contract of Work with the Government of Indonesia includes provisions for mining operations to continue until 2041.

in the written language. Putting these names into writing for the first time, I have used approximated Indonesian alphabetic phonetics. In many cases, I have also included suggestions for the potential use of these plants in the future.

Descriptions of plants throughout this book include collection numbers for plants that I collected, dried, and sent to several herbariums around the world: Royal Botanic Gardens, Kew, Universitas Negeri Papua, National Herbarium of Ireland, and the Botanical Institute, Switzerland (see Appendix A, Table A.1 for details). All of the photographs in the book are mine unless otherwise accredited. All ink and colored pencil illustrations presented in this book have been redrawn from my original field sketches (except for two, otherwise attributed) in a standard format by William Higginson. I am not a highly skilled botanical illustrator, and the simplicity of the field sketches reflects this.

While I made many notes and field sketches of plants for botanical identification during my time in Amungsa, additional references have been used to confirm and support plant identifications and descriptions, as well as the nutritional values of most of the food plants, and these are acknowledged throughout. Along with scholarly reference books and research papers, the internet proved a useful resource for accessing plant use and nutritional information in databases and websites. Multiple online resources were researched to ensure that web-sourced information used in this book could be considered reliable and current. These online references have been acknowledged throughout this text, but in recognition that website URLs change, move, and may become defunct, using search engines and key words is recommended for finding referenced information for which provided website addresses may become out of date or inaccurate.

Much of the detail recorded and many of the claims asserted in the book are, however, based on my field observations and direct communications with the Amungme. The information comes from their knowledge that they have passed directly to me during the years that I have lived and worked with them. Many of my personal anecdotes from time spent living with the Amungme are also provided throughout, in the hope of conveying the complex relationships between these people, their environment, their food, their belief system, their knowledge, and their oral history.

Acknowledgements

While much of the information in this book comes directly from my own research, neither the research nor the book could have been achieved without the involvement and support of numerous individuals and organizations.

Amungme who were instrumental in providing my education in their traditions and knowledge began with Teresia and Tobias Magal, Elisabet Beanal, Josepa Alomang, and other friends in the Kwamki Baru area of Timika. Later, in Tsinga Valley, Tamok Magal was by my side from dawn to dusk, ever ready to provide guidance and information on daily life and research treks. Tony Magal, and Daniel, Petrus, and Delina Beanal were also a big part of my life and education in Tsinga. Pia, Geradus, and Kristina Beanal, and Hans Kemong offered to hike to Tsinga with me and introduce me to their clan members there. In later work, I have Jutak Amonkoame (Jamang) from Banti (formerly from Amonkoa Valley), Oktopianus and Delina Jabame from Hoea Valley, and Junus Omabak from Opitabak in Wa Valley to thank. As one of the rare, more powerful leaders of the Amungme, Thom Beanal provided guidance from time to time and a letter of support for my work with pandanus trees. Wherever I went, the Amungme offered shelter and food. I thrived on their diet of natural foods from field and forest.

If not for PT Freeport Indonesia (PTFI) I never would have had the chance to meet the Amungme. From the start of my journey in Papua in 1977, they have supported my efforts to learn from and work with the Amungme people. PTFI and the Government of Indonesia gave me permission to conduct volunteer work with the Amungme during the first seven years of my time with them. Later, in 1992, when I hiked into Tsinga Valley for a year of isolation and research, my former husband, Wayne Cook, and his wife, Kath, based at PTFI, helped me by providing a means of transferring communication. Sometimes we sent letters with Amungme who were trekking between the PTFI mining operation and the villages, and other times by helicopter.

Special thanks to Bruce Marsh for taking an interest in my work and helping me to return and work with Chris Ballard's team on the 1997 Amungme Baseline Study, a PTFI-sponsored project conducted jointly by the Australian National University and Universitas Cenderawasih. Chris Ballard was a great mentor and leader for this project and also reviewed parts of this book. After I left Amungsa in 2007, Bruce Marsh helped me to re-establish contact with PTFI to coordinate the development of this book, as well as obtain the project management, writing, and editing help of Joanna Webster. With almost a decade of living and working in Amungsa with PTFI herself, and a botanical sciences and technical and scientific writing background, Joanna has been the best editor I could have hoped for, and has been very skillful at untangling the mass of text I sent her.

Stan Batey was my supervisor for many of the years I worked for PTFI with the Amungme, and his support has continued through reading and commenting on the manuscript of this book. He has been an inspiring role model, who truly cared about the Amungme and could deal wisely, fairly, and firmly with them. Kal Muller, who wrote the first comprehensive book on the Amungme with Junus Omabak (2008), has been a friend who could share the conditions of the field with me and enjoy the quest for new experiences and answers in the Amungme

way of life. He can read a mile a minute and provided many helpful references for me.

From her desks in several countries, Shari Knoerzer, Freeport-McMoRan's Director of Social Responsibility and Community Development - Africa/Asia, kindly and patiently added the final efforts to coordinate people across PTFI and its parent company Freeport-McMoRan, and to assure financial assistance to help get this book published. I also thank Shari, Paul Warren, Ian Watson, and my former coffee project team, Arnoldus Sanadi, Hery Aibekob, Harony Sedik, and Janus Beanal, for help with my final trip to Amungsa in May 2013.

Robin Hide of the Australian National University (College of Asia and the Pacific) has provided continuous assistance throughout the writing of this book. He meticulously reviewed the content, and has been ever ready with references and connections to experts in specific fields.

Alice Dewey and Les Sponsel of University of Hawaii were both wonderful mentors. East-West Center provided a four-year fellowship that allowed me to finish my degree without working elsewhere. They also provided funding for my 1992 research in Tsinga Valley. The USA National Science Foundation funded a year of research on pandanus trees in West Papua. Benjamin Stone of the Bernice Pauahi Bishop Museum, Hawaii, introduced me to pandanus trees, and botanist Matthew Jebb of the National Herbarium of Ireland was my very supportive expert in the field of pandanus following Ben's passing. I thank Matthew for his continuous input throughout the writing of this book regarding pandanus, ant-house plant, and pitcher plant species, and his assistance with identification. Botanists Robert (Bob) Johns and Tim Utteridge of the Royal Botanic Gardens, Kew, were also great mentors to me during their time collecting specimens within PTFI's Contract of Work area in Papua, and their ongoing help with botanical collecting techniques and identification was invaluable.

Much gratitude goes to John Ellenberger for the information he shared with me by email as well as all of the work he put into his very informative PhD dissertation about the Damal people of the northern Jayawijaya Mountain Range, who are the most closely related to the Amungme of all their neighboring peoples. Also, his wife, Helen, shared some of her experiences from the field of mission work with the Damal.

My life-partner, Will Higginson, ever-supportive of this endeavor, has helped me understand some of the spiritual and developmental aspects of early societies. He has also been invaluable for his efforts in the re-drawing of so many of my original field sketches for inclusion as illustrations in this book.

I thank Judy Busnarda, Lianne Johnsen, and all the team at Canadian Science Publishing, who were essential to making my dream of preserving the Amungme knowledge and my research a published reality.

Lastly, I thank you, the reader, for taking an interest in this work, in the Amungme people, and in the knowledge they have to offer of the plants of the Jayawijaya Mountains.

Contents

Illustrations

Dedication

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Chapter 5

Chapter 6

Chapter 7

Chapter 8

Chapter 9

Tables

Chapter 1

From Beneath the Earth

"We came out from beneath the surface of the earth at a place called Mepingama. That's the story of how people's life on earth began."
Amungme origin story.

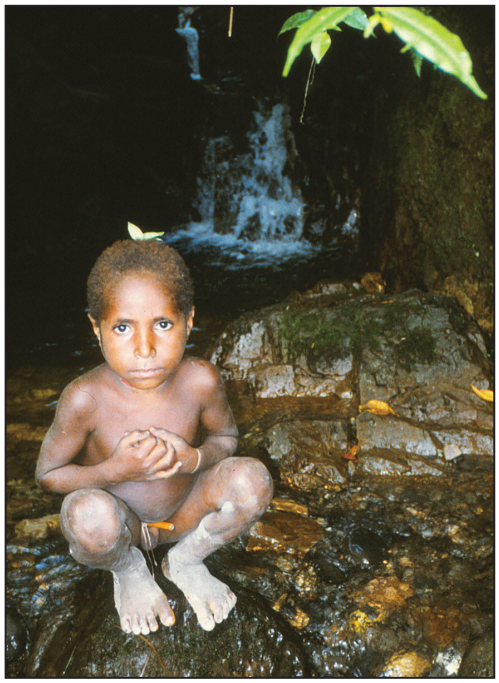


Figure 1.1: A young Amungme boy sits by a waterfall, partially hidden by a cavernous rock formation. The geography and geomorphology of Amungsa is reflected in their origin stories.

The Amungme, who identify themselves as the 'first people,'[1] (see Figure 1.1), are a group of about 8,000 (Muller and Omabak 2008) mountain Papuans living on the Indonesian half of the island of New Guinea, located at the eastern end of the Indonesian archipelago, just north of Australia (see Figure 1.2).[2] Similar to other Highland Papuans, the Amungme practice pig husbandry and horticulture as their means of subsistence, and bride price exchange as their traditional economic system. Separating them from other Papuan groups are their land (Amungsa) and their language (Amungkal). They organize their territory and daily activities according to environmental factors and kinship affiliation.

1.1 Amungsa: the homeland and environment of the Amungme

The Amungme live in twelve main valleys[3] on the southern slopes of the rugged Jayawijaya Mountain Range.[4,5] They call their mountain homeland Amungsa, which means 'land of

[1] *Amung* = first, *me* = people or men. Another interpretation is that the word *Amung* means south, as they were possibly the first Damal people to live in this set of valleys south of the Jayawijaya Mountain Range. Yet another interpretation (reported by some Timika Amungme) is that *Amung* means 'on the side of the mountain.'
[2] The western half of New Guinea, previously a Dutch colony, has been a province of Indonesia since 1963. Formerly known as Irian Jaya, Indonesia, the provincial name was changed to Papua in 2000 by popular request. It is also sometimes referred to as West Papua. The eastern half of the island, having been colonized by Germany and Great Britain, and administered by Australia from WWI until 1975, is now under its own independent governance as the country of Papua New Guinea.
[3] Smaller valleys form branches within these larger valleys. The valleys and sub-valleys west to east are: Duma, Jeba, Boma, Aroa, Wa, Nosola (also known as Notola), Bea, Tsinga, Kugung Wonema, Hoea, Amonkoa, Jila, Noemba (also pronounced Noema by some Amungme), Hompiliga, Bela, and Alama.
[4] Also known as the Sudirman Mountain Range.
[5] The research for this book was mainly conducted in four valleys: Aroa, Wa, Tsinga, and Hoea.

Figure 1.2: The Amungme homeland of Amungsa is found in Papua, Indonesia, in the western half of the island of New Guinea, on the southern slopes of the Jayawijaya Mountain Range (map courtesy of PT Freeport Indonesia).

the first people.' Formed by tectonic plate movements and overlaps, these mountains are very steep, and glacial erosion has carved away much of the softer geological material on the mountain slopes, leaving narrow, incised valleys between the sharp mountain ridges. High daily rainfall feeds numerous streams, rivers, and waterfalls, which pour down hundreds of meters from spectacular, hanging, smaller valleys perched high on the mountain walls. The high rainfall contributes to the ongoing natural erosion processes. Rock slides and landslips are frequent, and together with the sharp spires and pointed ridges of the mountain peaks, attest to the geologically youthful age of the range. The world's last remaining tropical glacier is found on the peaks of the Jayawijaya Mountain Range. This glacier is surrounded by sparsely vegetated alpine and sub-alpine zones that rapidly give way to a lushly rainforested montane region below.

Most Amungme who remain in their Amungsa homeland live predominantly in small villages and hamlets in the valleys of this well-vegetated montane region between the elevations of 1,000 m and 1,800 m above sea level (ASL).[6] The rugged beauty of Amungsa is an awesome sight. Upon arising in the morning, one's first impression of the high mountain valleys is that of a bright green patchwork of forest and fields sparkling with diamonds of dew and rain from the prior evening. Spider 'condominiums' beaded with water droplets reflect the morning sun and dot the lush landscape with giant, white clusters of filmy webs. The craggy, high mountains loom on three sides and a view of the lower valleys lies below. From some villages,

the greatly revered, snow-capped mountain, *Nemang Kawi*, which means 'white arrow' in Amungkal (also commonly known as Puncak Jaya, and formerly known as Carstensz Peak), can be seen in all her dazzling majesty (see Figure 1.3).

As the sun rises, so do the Amungme. "*Amua-gaig-e!*" they will call to each other, meaning, "Let's get up and get going, the light is here!" [7] They let their pigs out to forage for the day and prepare to go to their gardens on the mountainsides. The hills and valleys look gorgeous but try getting from one place to another! The terrain is steep and trails are rocky streambeds or nearly non-existent steep, muddy paths. By noon or shortly after, a blanket of cloud rolls up from the ocean some 100 km to the south, enshrouding the valleys and ridges in mist. Rain quickly follows the afternoon fog, and streams and rivers swell rapidly, muddy with runoff and sediment, making trekking between gardens and villages an arduous, if not unpleasant, task.

Daytime temperatures in the Amungsa valleys range between 20° and 30° Celsius (C), while nights drop to between 13° and 20° C. Rainfall ranges between 3,000 and 5,000 mm annually (Cook 1995). Being 4° south of the equator, the summer and winter daylight hours only vary by about 15 minutes, and sunrise and sunset arrive at about 6 am and 6 pm throughout the year, except for those Amungme who live in the shadows of the mountain walls or in very narrow valleys where light is more limited.

In the last hours of light, people make their way home through the cloud and rain to feed their pigs, cook the evening meal, and get dry and warm around a fire. The cicadas begin their evening song 15 minutes before dark and the insects I called 'snappers' (also a form of cicada) kick in 10 minutes later. These sounds tell people to prepare for the onset of night. Fires glow, and if they have them, candles may be lit.[8] In the more remote villages, it truly does feel like a community lost in time, or, as Alice Gibbons described it for the closely related Damal, they are like "*The people time forgot*" (Gibbons 1981).

Figure 1.3: *Nemang Kawi,* which means 'white arrow' in Amungkal, is the glacial peak of the Jayawijaya Mountain Range that towers over the Aroa, Wa, and Tsinga Valleys. Here it is photographed from my house in Beanegogom, Tsinga. Each Amungme patrilineage relates to a sacred peak of the Jayawijaya Mountain Range, but the Amungme believe that the peak of *Nemang Kawi* is the residence of their principal guardian spirits.

1.2 Papuan pasts and Amungme origins: how did it all begin?

Research by archaeologists gives a picture of how long the Papuan people have been in New Guinea and how they have changed through time. Archaeological records show humans have been in the upland valleys of the central

[6] Exceptions are where, within the last sixty years, people have relocated to the lowlands.
[7] This phrase also refers to the legendary point in time when the Amungme believe that all people first came out from within the earth. It was a time of emerging from darkness into the light. Amungme origin stories are discussed further in Section 1.2.
[8] Villages in the 1990s still had no electricity and to this day most still do not. The only villages with electricity are the ones where PT Freeport Indonesia provides and maintains this service.