



# INDIGENOUS KNOWLEDGE OF NAMIBIA

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Indigenous knowledge is the dynamic information base of a society, facilitating communication and decision-making. It is the cornerstone of many modern-day innovations in science and technology. It is also a ready and valuable resource for sustainable and resilient livelihoods, and attracts increasing public interest due to its applications in bio-technology, health, bio-prospecting, pharmaceuticals, agriculture, food preparation, mathematics and astronomy.

**INDIGENOUS KNOWLEDGE OF NAMIBIA** is a fascinating compendium aimed at a wide readership of academics and students, government officials, policy makers, and development partners. The 17 chapters examine the indigenous knowledge of medicinal plants for treating HIV/AIDS, malaria, cancer, and other microbial infections of humans and livestock; indigenous foods; coping and response strategies in dealing with human-wildlife conflicts, floods, gender, climate change and the management of natural resources. A new rationalisation of adolescent customary and initiation ceremonies is recommended in response to the HIV/AIDS pandemic; and a case study of the San people of Namibia speaks to the challenges of harmonising modern education with that of indigenous people.

The editors, **Kazhila C. Chinsebu, Ahmad Cheikhyoussef, Davis Mumbengegwi, Martha Kandawa-Schulz, Choshi D. Kasanda** and **Lawrence Kazembe**, are senior UNAM academics. Individual chapters are written by UNAM academics and post-graduate students from several disciplines in the natural and social sciences.

*"Before I went to a formal school [i.e. Western education], I had the opportunity of playing cultural games like mulabalaba, kanamundame, kudoda and other cultural games with my contemporaries. These games opened my eyes that by the time I started school I could do basic counting. I could count my father's cattle because of the knowledge I obtained from the cultural games." (A teacher from Zambezi Region).*



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Davis Mumbengegwi, Martha Kandawa-Schulz,  
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# Abbreviations and acronyms

°	degree(s)
%	per cent
ABS	access and benefit sharing
ad	<i>anno Domini</i> (number of years after the birth of Christ)
AIDS	acquired immunodeficiency syndrome
ALV	African leafy vegetables
AOAC	Association of Official Analytical Chemists
ART	antiretroviral therapy
ATCC	American Type Culture Collection
bc	number of years before the birth of Christ
BIKS	Bachelor of Indigenous Knowledge Systems
C	Celsius
CBNRM	community-based natural resource management
CDC	United States Centers for Disease Control and Prevention
CLM	Caprivi Liberation Movement
cm	centimetre(s)
CO <sub>2</sub>	carbon dioxide
CRIAA SA-DC	Centre for Research Information Action in Africa Southern African Development and Consulting
CSIR	Council for Scientific and Industrial Research
DMSO	dimethyl sulfoxide
DNA	deoxyribonucleic acid
DPPH	2,2-diphenyl-1-picrylhydrazyl
DRST	Directorate of Research, Science and Technology (ME)
DST	Department of Science and Technology (South Africa)
e.g.	for example
EMIS	Education Management Information System
ENP	Etosha National Park
et al.	<i>et alii</i> (and others)
EU	European Union

EUR	Euro(s)
EVM	ethnoveterinary medicine
FAO	Food and Agriculture Organization of the United Nations
FMD	foot-and-mouth disease
g	gram(s)
GIBEX	Global Institute for Bioexploration
GIZ	Deutsche Gesellschaft für Technische Zusammenarbeit
GRN	Government of the Republic of Namibia
H <sub>2</sub> O <sub>2</sub>	hydrogen peroxide
ha	hectare(s)
HIV	human immunodeficiency virus
HWC	human–wildlife conflict
IBPC	Interim Bio-Propecting Committee
IC <sub>50</sub>	half maximal inhibitory concentration
IEK	indigenous ecological knowledge
IKS	indigenous knowledge systems
ILO	International Labour Organization
InWEnt	Capacity Building International, Germany
IBPC	Interim Bio-Propecting Committee
IPTT	Indigenous Plant Task Team
LAB	lactic acid bacteria
µl	microlitre(s)
µg	microgram(s)
m	metre(s)
ME	Ministry of Education
MET	Ministry of Environment and Tourism
mg	milligram(s)
ml	millilitre(s)
mm	millimetre(s)
MoHSS	Ministry of Health and Social Services (Namibia)
MRC	Multidisciplinary Research Centre (UNAM)
NAD	Namibia Dollar
NANASO	Namibia Network of AIDS Service Organizations
NBC	Namibia Broadcasting Corporation
NBF	Namibia Biosciences Forum
NBRI	National Botanical Research Institute
NCI	National Cancer Institute (in the USA)
NEPAD	New Partnership for Africa's Development

NGO	non-government organization
NIKSO	National Indigenous Knowledge Systems Office
NLV	Namibian leafy vegetables
NPC	National Planning Commission
p.	page
PEPFAR	[USA] President's Emergency Plan for AIDS relief
pH	power of hydrogen ion concentration as a measure of acidity or alkalinity
pl.	plural
pp.	pages
RAEIN-Africa	Regional Agricultural and Environment Initiatives Network-Africa
RCT	rational choice theory
SANBio	Southern Africa Network for Biosciences
sing.	Singular
sp.	species (sing.)
spp.	species (pl.)
STAT3	signal transducer and activator of transcription 3
SWAPO	South West Africa People's Organization
TLC	thin-layer chromatography
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNAM	University of Namibia
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USA	United States of America
USD	United States Dollar
VCF	veterinary cordon fence
WHO	World Health Organization
WIPO	World Intellectual Property Organization
ZMW	Zambian Kwacha

# Introduction

**Kazhila C. Chinsembu**

Why this book, *Indigenous Knowledge of Namibia*? Nowadays, indigenous knowledge has gained prominence and attracted public interest due to its numerous applications in science and innovation: biotechnology, health, bioprospecting, pharmaceuticals, medicinal plants, agriculture, food preparation, mathematics, natural resource management, climate change and astronomy.

There are many niche players in the field of indigenous knowledge in Namibia and many studies being carried out. Thus, although not all aspects of Namibia's indigenous knowledge are covered in this book, most readers from various walks of life – laypersons, scholars and policy makers – will find this book a very useful companion. The content of this book serves as a good starting point, because 'we cannot go further into the future without looking deeper into the past' (anonymous).

Through their laboratory and scientific studies, the authors of this book serve as guides through the journey to discover and record the indigenous knowledge of Namibian society. More importantly, their individual and collective works endeavour to add value to Namibia's indigenous knowledge. The voyage and value addition are aimed at bringing greater clarity to some of the most perplexing aspects of indigenous knowledge in Namibia.

Authors are aware that local communities need to benefit from their indigenous knowledge. That being said, the aim of this book is not to appropriate the indigenous knowledge of local communities, as most indigenous knowledge is already in the public domain. Rather, in line with Namibia's National Programme on Research, Science, Technology and Innovation (NPRSTI), the aim of this book is to 'ensure that indigenous knowledge is properly documented' (NCRST, 2014, p.14).

Many definitions and connotations of indigenous knowledge are provided in this book. However, it is important to note that indigenous knowledge is the foundation of Namibian society, an information base which facilitates communication and decision-making. It is dynamic, being continuously influenced by internal creativity, experimentation and external contacts. Moreover, indigenous knowledge is the

cornerstone of many modern-day innovations in science and technology. It is also a ready and valuable resource for sustainable and resilient livelihoods.

A brief historical background and context to this book is imperative. The idea to write this book was conceived by Professor Kazhila C. Chinsembu in January 2012. A proposal was made to the Faculty of Science Academic Board meeting, University of Namibia (UNAM), which approved the book project. An invitation was later extended to research staff in UNAM's Multidisciplinary Research Centre (MRC) who agreed to collaborate with academics from the Faculty of Science. This book is therefore a joint collaborative effort of the Faculty of Science and MRC.

To operationalize the book project, book chapters were drawn from presentations made during the 2nd Symposium, Indigenous Knowledge Systems (IKS): From Concepts to Applications, organised from 8 to 9 October 2012, by IKST Food and Beverages Programme of the Science, Technology and Innovation Division of MRC. This was followed by a Book Writers' Workshop to assist potential authors to draft and develop their book chapters.

Briefly, the book is arranged in 17 chapters. The first six chapters are devoted to the indigenous knowledge of medicinal plants for treating HIV/AIDS-related symptoms and diseases, malaria, cancer, and other microbial infections of humans and livestock. These are followed by chapters 7–10 which are assigned to indigenous foods, and chapters 11–13 that espouse the indigenous knowledge used to cope with human–wildlife conflicts and floods, as well as that which underpins the nexus of gender, climate change and management of natural resources.

Chapter 14 unravels the indigenous knowledge of the Mafwe ethnic group. Chapter 15 speaks to the challenges of harmonising modern education with that of the indigenous San people of Namibia. Chapter 16 urges a new rationalization of adolescent customary and initiation ceremonies in response to the HIV/AIDS pandemic. Chapter 17 sums it all up, offering a compelling argument for universities and other institutions of higher learning to rise to the occasion and integrate indigenous knowledge into existing or new degree programmes.

In Chapter 1, Chinsembu unpacks the indigenous knowledge of plants used to manage HIV/AIDS. Since Namibia is a diamondiferous country, Chinsembu introduces the term 'green diamonds' to refer to all the medicinal plants used in the management of HIV/AIDS in Namibia. Chinsembu agrees that while Namibia has made remarkable progress in the provision of antiretroviral therapy (ART) to HIV/AIDS patients, the country's ART programme is threatened by diminishing financial resources.

Given this shortcoming, there is reason to evaluate elements of traditional medicine, particularly medicinal plants and other natural products, that can yield effective and affordable therapeutic agents for conditions related to HIV/AIDS. Unfortunately, knowledge of ethnomedicines for HIV/AIDS is still vague and not well documented. Besides the problem of documentation, laws and administrative

structures, public trust, and the lack of recognition of traditional healers continue to hamper the integration of traditional medicines within modern ART programmes. So, in Chapter 1, Chinsembu describes a contextual model for initiating collaboration with traditional healers as well as the repertoire of putative anti-HIV plants whose chemical constituents are being evaluated for possible development into novel antiretroviral drugs for AIDS.

Chapter 1 is part of a fresh corpus of scholarly works that draws on new empirical evidence about the medicinal efficacy of plants against HIV infection. This work overthrows the long-standing notion held by the medical and pharmaceutical fraternities that the crude aqueous extracts of medicinal plants, as used by traditional healers, are ineffective against HIV. Yet, most importantly, the antimicrobial and anti-HIV ethnobotanical data suggest an opportunity for inventing new drugs from Namibian flora.

Chapter 2, by Du Preez, Nafuka, Mumbengegwi and Bock, is on the indigenous knowledge of medicinal plants used to treat symptoms of malaria. Although malaria is on the decline in Namibia and the country is moving towards elimination of the disease by 2020, the authors contend that local communities continue to use traditional medicines to manage the disease. Ethnomedicinal plants are used to treat malaria-like symptoms in regions where the disease is endemic.

The authors are careful to state that it is premature to conclude that herbal medicines can be used as effective antimalarials, for several reasons. Most of the literature on medicinal plant remedies in Namibia lacks detail and specificity, including locality, abundance and plant parts used; mode of preparation, dosage and period of treatment; and the active components present in plants. In this chapter, the authors present data from investigations on antiplasmodial properties of selected Namibian plants. The authors conclude that the presence of compounds with antiplasmodial action strongly supports the traditional use of the plants for managing malaria symptoms.

The authors of Chapter 3, Dushimemaria, Mumbengegwi and Bock, detail the different plants used by ethnic groups in Namibia as medicinal remedies for alleviation of cancer symptoms. The authors present results on the phytochemical screening of local plant materials for anticancer properties. The presence of antiprotease activities and phytochemicals such as coumarins, anthraquinones, alkaloids, triterpenoids and flavonoids justifies the use of these medicinal plants in the management of cancer in Namibia and beyond.

Chapter 4 analyses the indigenous knowledge of medicinal plants used for the treatment of microbial infections. Mumbengegwi, du Preez, Dushimemaria, Auala and Nafuka, using phytochemical screening of extracts, show the presence of classes of compounds associated with antimicrobial activity against oral pathogens, enterobacteria, food-borne and other opportunistic pathogens.

Chapter 5 is about the exciting field of ethnoveterinary medicine (EVM). In this chapter, Chinsembu showcases the indigenous knowledge of plants used to treat livestock diseases. The rationale for EVM is simple. Small-scale and resource-poor livestock farmers cannot afford expensive synthetic pharmaceutical drugs. Therefore, they draw on their indigenous knowledge to unlock the power of EVM plants to treat animal diseases. However, there is no ethnoveterinary pharmacopeia and data on ethnoveterinary usage of plants are still sparse. In Chapter 5, ethnobotanical data from Namibia are briefly discussed within the prism of current knowledge of EVMs in selected African countries such as Botswana, Côte d'Ivoire, Ethiopia, Kenya, Nigeria, South Africa and Zambia.

Chapter 6 illustrates that indigenous knowledge is not just old-fashioned 'stuff' for the older folks. Kasanda and Kapenda, working with Junior High School learners in the Omusati and Oshana regions, show that high-school learners hold differing levels of knowledge on the use of traditional medicinal plants in curing common ailments and diseases. Female learners tend to be more knowledgeable of the traditional medicinal plants and their uses within their environment than male students. Interestingly, the majority of learners in this study are in favour of tuition on the use of traditional medicinal plants forming part of the science curriculum in Namibia. In retrospect, the authors also deduce that making the learners aware of the important use of medicinal plants will help preserve the plants for use by future generations.

In Chapter 7, Mushabati, Kahaka and Cheikhoussef show that African leafy vegetables (ALVs) contain phytochemicals with medicinal value. Antimicrobial activities of the ALVs also confirm the urgent need to promote the consumption of ALVs as nutraceuticals, foods that provide medicinal or health benefits, including the prevention and treatment of diseases.

Heita and Cheikhoussef in Chapter 8 delve into the indigenous knowledge of fermented milk products. The chapter focuses on three traditionally fermented milk products, namely *omashikwa*, *mabisi* and *mashini ghakushika* which are common in north-central and north-eastern Namibia. The authors isolate and identify key lactic acid bacteria (LAB), and analyse the physicochemical properties of the traditional milk products. Their results show the great potential in the microflora of these milk products, which can be used to control the fermentation process and thus extend the shelf life of most traditionally fermented milk products in Namibia.

Chapter 9 is about *oshikundu*, an indigenous, non-alcoholic fermented beverage. Here, the authors Embashu, Cheikhoussef and Kahaka report on the physicochemical and nutrient content of this indigenous beverage. The importance of this research is to provide fresh insights into the possibility of extending the shelf life of *oshikundu*.

Whenever you need an indigenous food delicacy from Namibia, consider eating the African bullfrog. In Chapter 10, Okeyo, Kandjengo and Kashea appeal to our appetites. The authors dissect the indigenous knowledge surrounding the

Aawambo consumption of the giant African bullfrog *Pyxicephalus adspersus*, which besides being a source of food, has medicinal uses as well. They also mention the indigenous practices for the treatment of *oshiketaketa* infections. Various folklore beliefs, observations by local people on the propagation of the frogs, and future multidisciplinary research recommendations are presented.

Indigenous knowledge shapes our coping and response strategies. Chapter 11 weaves together the indigenous knowledge used in the management of human–wildlife conflicts along the borders of an important national park in Namibia. Lendelvo, Angula and Mfunne report findings of a study which investigated how both commercial and communal area farmers living around Etosha National Park use their indigenous knowledge in dealing with human–wildlife conflicts. The study revealed that farmers are aware of problem animals and identify them through their spoor, calls and behaviour. The authors conclude that the indigenous knowledge of farmers in the vicinity of Etosha National Park has shaped local human–wildlife conflict management responses.

Coping with floods can be a daunting task. Understanding the indigenous coping strategies of the Basubiya people on the flooded plains of the Zambezi River is an even more daunting task. But, in Chapter 12, Mbukusa helps readers to understand how the Basubiya people know the scale of the floods that surround them, what makes them enjoy the time of flooding, how they cope during the floods, and whether they will ever move from the floodplains to higher grounds. The author asserts the need for government policy makers and disaster management agencies to understand the indigenous knowledge and coping skills of the Basubiya in order to improve future flood management operations.

Chapter 13 provides a lens through which we can view and bring into sharp focus the gender–climate–change nexus. The authors, Siyambango, Kanyimba and Mufune (now deceased, may his soul rest in peace), examine the significance of indigenous knowledge, highlight some areas of climate–change vulnerability and resilience in which indigenous knowledge is relevant, and suggest a mechanism to make it explicit in rural Namibia. The chapter is largely conceptual or even contextual as it examines issues of climate change especially impacting girls and women in rural Namibia. The authors use several examples to interrogate a gendered approach in coping with climate–change–induced environmental and natural resources management issues such as drought, fetching water and firewood, subsistence livestock and crop agro–ecosystems, and the use of scarce medicinal plant resources to survive the threats of water- and vector-borne diseases.

In Chapter 14, Lilemba and Matemba, on reclaiming indigenous knowledge in Namibia’s post-colonial curriculum, use the Mafwe people as a case study. The authors argue that during Namibia’s colonization by Germany and South Africa, missionaries and colonial powers regarded the indigenous system of education as barbaric and an obstacle to the spread of Christianity and Western culture. Yet, before

the advent of Eurocentric education, African communities used their indigenous knowledge-based education systems to survive many odds. Nowadays, scholars on indigenous knowledge are using systematic enquiry about indigenous philosophical ideas and issues that frame contemporary indigenous thought, perspective, and worldview. The authors suggest that African riddles, folklores and proverbs can be used to impart knowledge and skills to younger generations as this is compatible with modern western education. They urge that Namibian school curricula should also include indigenous knowledge to enhance learning and teaching.

Chapter 15 examines the case of the San people of Namibia. In this chapter, Mashego-Brown and Haihambo confront the developmental issues facing the San of Namibia. While the authors provide a hint of the 'pot-holed' road to de-marginalization and formal education, they also admit the San do and will generally remain poor because their children do not attend school to a satisfactory level – a warning sign that the San will remain inferior to other ethnic groups who use education as a pathway to poverty alleviation. The chapter reveals that amongst the San culture is inclusive in nature and those affected by HIV are accepted.

Mashego-Brown and Haihambo find the San of Namibia to be at a crossroads because amongst these indigenous people, some want to maintain their indigenous culture and indigenous education. They also want to maintain their indigenous health practices and direct dependency on the immediate environment for survival. But, ironically, another section wants to move with the times, to leave their indigenous culture behind, and to retain only part-time cultural practices compatible with modern education and practices.

In Chapter 16, Haihambo explores the messages communicated to adolescents and young adults during traditional initiation ceremonies and premarital counselling in Namibia. The main aim is to determine the degree to which such messages are adapted to national HIV/AIDS response strategies. Using research studies on the Aawambo, Ovaherero, Ovahimba and Damara ethnic groups, the author takes an ethnocentric walk and revisits the indigenous 'curricula' used by the various ethnic groups to advise adolescents on how to lead adult lives in a particular cultural context. As she found out, it would seem that because such curricula have been transmitted from generation to generation, the curricula are still so rigid that they exclude new developments such as HIV/AIDS, not to mention gender equality. The author recommends that traditional practices should evolve with the times and should therefore incorporate HIV content in their indigenous life skills and counselling programmes.

Finally, Chapter 17 urges the integration of indigenous knowledge into university studies. The authors, Grace Chinsembu and Miriam Hamunyela, investigate the perceptions of lecturers towards integrating indigenous knowledge into the university curriculum, showing that most lecturers support the concept. However, the challenges of integrating it into the curriculum include the following: unskilled person-power,

lack of documentation, the non-scientific nature of indigenous knowledge, and different cultural backgrounds of students and lecturers. Despite these shortcomings, and given the strong paradigm shift to indigenous knowledge, the authors urge the University of Namibia either to integrate it into existing curricula or to implement new indigenous knowledge degree programmes and courses.

*Indigenous Knowledge of Namibia* is an important book that rekindles our interest in documenting indigenous knowledge because the libraries of this tacit knowledge are usually older people who are not part of educational establishments. As efforts are being made to mainstream indigenous knowledge into formal education, there is a need to document available indigenous knowledge in order to ensure its effective instruction, learning and preservation. This book is a modest effort to document Namibia's indigenous knowledge in a single corpus.

In conclusion, the editorial team thanks all the indigenous knowledge holders, the man and woman in the village, without whom this book would still be a figment of our imaginations. Be that as it may, the opinions and interpretations expressed in various chapters of the book are those of the respective authors, and not of the chief editor, assistant editors or the institutions they represent. Many thanks for reading *Indigenous Knowledge of Namibia*.

## Reference

NCRST [National Commission for Research, Science and Technology]. (2014). *The National Programme on Research, Science, Technology and Innovation (NPRSTI) 2014/15 to 2016/17*. Windhoek: Author.