Communities, conservation and livelihoods

Anthony Charles, Editor

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About the Community Conservation Research Network (CCRN)

The CCRN is a global partnership of Indigenous, academic, community, governmental and non-governmental partners, focusing on the linkages of environmental stewardship and sustainable livelihoods at a local community level. The CCRN engages with and supports communities and Indigenous organisations, drawing on a range of expertise covering the commons, social-ecological systems, community-based management, climate and environmental change, governance and rights, conserved areas, natural resources, engagement and empowerment. Through on-the-ground participatory research and international synthesis, the CCRN produces knowledge, insights and policy recommendations to improve the effectiveness and equity of environmental conservation and the sustainability of livelihoods. The results of CCRN's work are covered in this book, and throughout the CCRN's resources platform, which includes the documentary *Sustainable Futures – Communities in Action* and the results of the international conference Communities, Conservation and Livelihoods held jointly with IUCN-CEESP.

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Foreword

It was with great pleasure that IUCN Commission on Environment, Economics and Social Policy (CEESP) partnered with the Community Conservation Research Network (CCRN) in May of 2018 to host the Communities, Conservation and Livelihoods Conference. Through this partnership, we had the opportunity to shine a spotlight on Indigenous peoples and local communities (IPLCs) around the world, show how they are engaging in environmental conservation supporting sustainable livelihoods, and articulate how they can be best supported in policy and practical programmes.

Indigenous peoples and local communities are, and remain, at the forefront of protecting the planet, and share with us a wealth of knowledge, experience and sustainable practices that the world desperately needs. At the same time, we also must recognise that nature managed by IPLCs is under increasing pressure, including from resource extraction, commodity production, mining, and transport and energy infrastructure, which has only been exacerbated with the COVID-19 global pandemic. The IPBES Global Assessment documented that while nature is generally declining less rapidly in IPLCs' land than elsewhere, it is declining there as well. The negative impacts of these pressures include continued loss of subsistence and traditional livelihoods, impacts on health and well-being, and loss of economic development opportunities from the sustainable use of natural resources. These impacts also impede traditional management practices, transmission of Indigenous and local knowledge (ILK), and the ability of IPLCs to effectively manage natural resources that are relevant to the broader society. Therefore, it is ever more important that the voices, stories and experience of IPLCs are recognised and elevated in the national and global policy context.

I am pleased that CEESP is able to support the CCRN in celebrating and elevating these local community efforts through this *Communities, conservation and livelihoods* book. The book brings together a decade of experience from across the globe and provides us with examples of community leadership, success and sustainable livelihoods in conservation, as well as highlighting existing and persistent challenges that communities face in a changing world.

I applaud the CCRN, under the leadership of Anthony Charles, and all of their collaborators who have built upon and learned from the deep knowledge of Indigenous and local communities' collective action. I invite you to be inspired and engaged by the stories and experiences of the Indigenous and local communities in this book.

Kristen Walker Painemilla
Chair
IUCN Commission on Environment, Economics
and Social Policy

Preface

The story begins several thousand years ago. Over the course of millennia, Indigenous societies have been linking together their need to sustain livelihoods with an appreciation of the importance of the natural world and a recognition of the need for stewardship. Others, over time, also began practicing this crucial balancing of healthy ecosystems and sustainable livelihoods. Today, we see this as a critical feature of the modern world. The tensions involved are present globally, notably in how we seek to address climate change while also maintaining the functioning of our social and economic systems. The need for joint attention to conservation and to sustaining economies is apparent as well in local, place-based communities around the world. In every country of the world, in urban neighbourhoods and rural towns and villages, people are coming together in their communities to find solutions that sustain their livelihoods and maintain, or restore, healthy local environments.

This book celebrates the efforts of local communities, literally thousands of them the world over, all seeking to resolve the essential challenge of conservation and livelihoods. The book reflects the results of over a decade of studies focusing on communities, conservation and livelihoods, through the Community Conservation Research Network (CCRN), a global initiative that involves a wide range of Indigenous, academic, community and non-governmental organisations (NGOs). As will be seen in this book, the linkages of conservation and livelihoods arise within underlying 'social-ecological' systems, they are rooted in the varying meanings of and motivation for conservation, they are affected by issues of power and of governance, and they lead to a wide range of biodiversity and livelihood outcomes. And in many situations, there are crucial Indigenous perspectives to be considered.

The CCRN initiative has involved 30 sites globally, with participatory action research that engages local communities and Indigenous organisations to explore how environmental conservation and sustainable livelihoods are interwoven. This has led to a set of Community Stories, each recounting the experiences of one of the CCRN sites, as well as a range of videos, webinars and animations. These resources are all available on CCRN's website, together with a participatory map, to invite others to share community stories. The CCRN website also provides the thematic results of a major international meeting convened by CCRN and IUCN (International Union for Conservation of Nature) with the same title as this book – Communities, Conservation and Livelihoods. We in the CCRN are very grateful in particular to IUCN's Commission on Environmental, Economic and Social Policy (CEESP) which not only co-hosted the conference, but also supported the publication of this book.

CCRN's work builds on the deep knowledge of Indigenous and local communities themselves, and the research efforts of Nobel Prize winner Elinor Ostrom and many others over the past half-century. Their work, and that of Ostrom in particular, show the importance of 'collective action' – people in communities meeting their challenges together by working together. As we live through the COVID-19 pandemic and a new era for societies around the world, the need for collective action has never been greater.

This book contains many inspiring stories of collective action of communities around the world, as they address and, in many cases, solve local challenges of environment and livelihoods. Although these stories reflect experiences before COVID-19, within them are ingredients of collective action that we need to move forward today.

Anthony Charles, Editor
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To begin, all the contributors are grateful to the local communities around the world, who have shown what cohesion and strength, sustainability and resilience, struggle and success, look like 'on the ground'. We are inspired by what is achieved by local communities, and we are grateful to those we have worked with collaboratively over the years.

The success of CCRN, as a network, is a result of the great efforts of all CCRN participants, many of whom were involved over the course of a full decade. The complete list of participants is given below. While many contributed directly to this book, every single person contributed to the knowledge and understanding that the team has developed over the years (core team marked with an asterisk.)

CCRN participants include core contributors who have been with CCRN since before it formally began, and whose participation literally made the whole network possible. There are also many student members of the CCRN, successfully trained over the course of the past decade. Then there are affiliates, who joined mid-way and have made their own outstanding contributions. Further, we all owe a great deal to the various staff members who have worked with CCRN over the years, and kept everything moving along so well.

It would be too lengthy to describe the contribution of each CCRN participant. However, there is one person who will receive a special note: Fikret Berkes has provided crucial guidance throughout the CCRN enterprise, and although not listed as an editor of this book, he has helped in guiding this project as well – he has the status of 'Honorary Editor'.

The CCRN is composed of not only individuals; several CCRN partner organisations have played essential roles. The Innu Nation (Labrador, Canada) and the Nuu-chah-nulth Tribal Council (British Columbia, Canada) have provided an Indigenous grounding for us all, as well as active participation. The Ecology Action Centre and West Coast Aquatic have been strong and supportive non-governmental partners. Environment and Climate Change Canada, a unit of the Canadian government, was also an important partner throughout the CCRN's experience.

Other organisations and individuals provided crucial support over the years. Most notably, we are grateful to the Social Sciences and Humanities Research Council of Canada (SSHRC) for their major funding of the CCRN, and to Saint Mary's University for hosting the network. Nexus Media produced several videos and a full-length documentary for CCRN – all freely available on the CCRN website. Collaborating with Nexus Media, and notably its leader Don Duchene, has been a pleasure. White Raven Consulting, notably Dawn Foxcroft and Kelly Poirier, produced wonderful animations (also available on the CCRN website) and excellent meeting facilitation. Brenda Parlee and Charles Levkoe provided excellent reviews that greatly improved the book, and Diwata Hunziker and Beth Abbott gave valuable support in the production of the book.

One other organisation and two individuals deserve a special note. When the CCRN began envisioning a major conference to share insights on the interactions of around the world, a new collaboration developed with the International Union for Conservation of Nature (IUCN) Commission on Environmental, Economic and Social Policy (CEESP). This proved to be an exceptionally productive and enjoyable partnership. At the core was a continuing close interaction with CEESP Chair, Kristen Walker Painemilla, and Deputy Chair, Ameyali Ramos. Together, CCRN and IUCN CEESP brought to reality the highly innovative 2018 meeting, *Communities, Conservation and Livelihoods,* the results of which may be found today on the CCRN website. The book you are reading, written by CCRN and co-published by IUCN CEESP, is another output of this strong collaboration.

Acronyms and abbreviations

BWFRC	Bayers Westwood Family Resource Centre
CBD	Convention on Biological Diversity
CBT	Clayoquot Biosphere Trust
CCA	Community conservation area
CCRN	Community Conservation Research Network
CEESP	Commission on Environmental, Economic and Social Policy
CRUF	Common Roots' Urban Farm
CSO	Civil society organisation
DAFF	Department of Agriculture, Forestry and Fisheries, Oceans and Coasts Branch
DEA	Department of Environmental Affairs
EAC	Ecology Action Centre
EBM	Ecosystem-based management
EMP	Estuary management plan
GEF	Global Environment Facility
HDI	Human Development Index
ILK	Indigenous and local knowledge
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPLC	Indigenous peoples and local communities
ISANS	Immigrant Settlement Association of Nova Scotia
IUCN	International Union for Conservation of Nature
LEK	Local ecological knowledge
MPA	Marine protected area
NEST	West Coast Nature, Education, Sustainability, Transformation
NGO	Non-governmental organisation
NTC	Nuu-chah-nulth Tribal Council
OECM	Other effective area-based conservation measures
PA	Protected areas
PES	Payments for environmental services
REDESUAPA	Rede para o Desenvolvimento Sustentável do Alto Paraíba (Upper Paraíba River Sustainable Development Network)
SANParks	South African National Parks
SDG	Sustainable Development Goals
SES	Social-ecological systems
SEZ	Special Economic Zone
SSHRC	Social Sciences and Humanities Research Council of Canada
SWF	Samudram Women's Federation
TCO	Tierras Comunitarias de Origen (Original Community Territories)
TEK	Traditional ecological knowledge
TNP	Tsitsikamma National Park
UN DESA	United Nations Department of Economic and Social Affairs
UNESCO	United Nations Educational Scientific and Cultural Organization

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Chapter 1

Introduction

Anthony Charles

In most places around the world, people are an integral, sometimes dominant, part of the environment. This has two implications. First, a key requirement for sustainability success lies in finding ways to meet the dual goals of conserving nature and providing for the well-being and quality of life of people. Second, while conservation and stewardship certainly require considering the problems created by human impacts, they can also draw on the considerable potential of humans to solve a range of environmental challenges.

Global sustainability requires corresponding responses at a global level. Equally, there is a need for bottom-up change. Indeed, there is much that can be done, and is being done, at the local level. This book explores how local communities around the world are successfully responding to threats to the environment and local livelihoods. As communities continue to make a difference at the forefront of conservation, it is an auspicious moment to explore the links of community environmental stewardship, sustainable livelihoods and government engagement, and to appreciate the 'power of community'.

The issues raised in this book are of international environmental policy interest, in particular in relation to the Sustainable Development Goals (SDGs) (UN DESA, n.d.). Many of the 17 SDGs are directly related to the efforts of local communities to engage in environmental stewardship supporting sustainable livelihoods, including those with a human focus, such as SDG 1 *(No Poverty)*, SDG 5 *(Gender Equality)* and

SDG 8 *(Decent Work and Economic Growth)*, and those of a more environmental nature, such as SDG 14 *(Life Below Water)* and SDG 15 *(Life on Land)*, as well as SDG 11 *(Sustainable Cities and Communities)* and SDG 13 *(Climate Action)*.

Several major international initiatives are also addressed, including the work of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)[1] and the Convention on Biological Diversity (CBD).[2] The book is especially relevant to the International Union for Conservation of Nature (IUCN)[3] in particular its Commission on Environmental, Economic and Social Policy (CEESP)[4] which is publishing this book as part of an ongoing collaboration with the Community Conservation Research Network (CCRN).[5] The book builds on recent CCRN work linking communities, conservation and livelihoods (see for example, Armitage et al., 2017).

In seeking to contribute to progress of the SDGs, and build on the links mentioned above, this book intends to explore three inter-related themes:

1 the nexus, or interaction, of conservation and livelihoods in local-level communities, and the actual or potential involvement of governments and civil society;

2 the values and goals that underlie decisions, and the institutions within which decisions are made; and

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1   www.ipbes.net
2   www.cbd.int
3   www.iucn.org
4   www.iucn.org/commissions/commission-environmental-economic-and-social-policy
5   www.communityconservation.net

3 the nature of success in conservation-livelihood linkages, and the potential for increased attention within the conservation field to action at the local level.

Accordingly, the book addresses several key questions to help build a better understanding of (and support for) the links between sustainable livelihoods and environmental conservation from a community perspective: What does conservation and stewardship mean to different communities and governments? What motivates action and policy for conservation of biodiversity and for sustaining livelihoods? How do local conservation initiatives meet community livelihood priorities? How are communities meeting challenges, and what can we learn from their experiences? How can government policy best support local stewardship and livelihood initiatives? Can we find synergies between Western science and the local and Indigenous knowledge, practices and values of communities? How do we deal with trade-offs in order to achieve the double objectives of conservation and livelihoods?

1.1 Content and structure

This book highlights concrete examples of:

- how local-level community conservation initiatives can be self-sustaining and successful;

- how they can benefit both conservation and livelihoods when effectively supported by government policy and practice: and

- how recognising community knowledge helps to improve both economic and environmental outcomes.

While the emphasis is on grassroots efforts of local communities, the book also looks at community involvement in larger-scale conservation activities. It builds on and adds to a well-established understanding of the potential for improved environmental stewardship and resource management through community involvement.

The insights into the workings of local stewardship described throughout the book provide guidance not only to communities, on the most successful paths for environmental and livelihood sustainability, but also to governments, on opportunities for scaling-up community stewardship and enhancing the role of local communities in conservation policy and practice. Drawing on participatory and community-based approaches to conservation, the book makes a case for greater attention, in national and international policy, to conservation at the local level. The environment will not only benefit from, but may fundamentally depend on, these local stewardship practices.

The **key messages** of the book suggest various priorities for going forward in community conservation and its role in achieving the SDGs and contributing to global initiatives.

Part I is composed of 10 chapters, including the Introduction. Chapter 2, by Charles and Berkes, introduces community-based approaches linking conservation and sustainable livelihoods. The chapter first briefly reviews the historical context of resource management and conservation, then introduces community-based conservation, the CCRN and the international collaboration that led to this book, and a preview of insights or 'key messages' arising from more than a decade of studying communities, conservation and livelihoods.

The core guiding idea of social-ecological systems (SES), the integrated concept of humans in nature, is the focus of Berkes in Chapter 3. Treating social and ecological subsystems as coupled, interdependent and co-evolutionary, the SES approach can ensure a holistic, integrated view of environmental and natural resource topics and, in particular, community conservation.

A key question arises in any SES as to how various players in society see the ideas of 'conservation' and 'stewardship'. Different societies and cultures have different meanings and perceptions of what is meant by conservation. A related question concerns conservation motivation. What is it that motivates various players within and across communities, including governments, business, civil society and others, to take on conservation efforts? The theme of 'meanings and motivations' for conservation is

examined by Sowman, Rice, Arce-Ibarra and Peña-Azcona in Chapter 4.

While local communities typically take action based on multiple objectives, achieving real environmental benefits for the community is a key one in conservation initiatives. Success in conserving biodiversity and restoring the health of ecosystems supports community quality of life. Dearden, Downie, Seijo and Charles examine the achievement of positive 'biodiversity outcomes' in Chapter 5. In this regard, CCRN results indicate that sustaining local livelihoods is also a vital motivation for community action. Indeed, the success of community conservation seems to depend considerably on success with livelihoods – it is an essential result of most such endeavours. Accordingly, Seixas, Loucks and Mendis-Millard examine the importance of achieving positive 'livelihood outcomes' in Chapter 6.

Issues of governance around who makes decisions, and how, are addressed by Armitage, Esteves Dias, Muhl, Makino, Lem, Loucks and Sugimoto in Chapter 7. The chapter examines community conservation and conservation-livelihood links at a community level, taking a governance perspective that draws on the SES framework, conservation meanings and motivations, and the nature of biodiversity and livelihood outcomes.

Related to governance is power – an underlying force affecting decision-making within community conservation, and any other realm of society, who has power and who does not is a critical factor in influencing outcomes. Certainly, this is the case for local communities with their internal power dynamics and external influences, as explored in Chapter 8 by Nayak.

Although most case studies do not focus on Indigenous communities or Indigenous knowledge, there are crucial lessons to learn from Indigenous perspectives on community conservation that apply broadly. There are also crucial issues of rights in Indigenous cases. These matters are explored by Nuna, Sable, Foxcroft and Simbine in Chapter 9.

Each of the chapters in the book provides a form of synthesis around a certain theme. Chapter 10

(Charles and Berkes) attempts a 'synthesis of the syntheses' to bring together all the various insights provided so far in the book, with an emphasis on lessons and recommendations for policy and practice in linking communities, conservation and livelihoods.

Finally, a Postscript to the main text briefly discusses the themes – notably the links of local communities, conservation and livelihoods – in the context of the COVID-19 pandemic.

Part II of the book provides a set of community stories, with inspiring examples of work toward community conservation and sustainable livelihoods, in 10 communities and four regions across the globe. The communities are: Koh Pitak Island (Thailand); Koh Sralao (Cambodia); Les Village, Bali (Indonesia); Haruku Village, Maluku Province (Indonesia); Sao Luis do Paraitinga and Catucaba (Brazil); Vila dos Pescadores (Brazil); Punta Allen, Quintana Roo (Mexico); Tsitsikamma (South Africa); Olifants Estuary (South Africa); Halifax (Canada). The four regions include clusters of communities in: i) northern Amazon (Bolivia); ii) Chilika Lagoon (India); iii) Qeshm Island (Iran); and iv) Clayoquot Sound, British Columbia (Canada). The nature of these locations and considerations leading to the production of the community stories are discussed in a brief introduction to Part II.

The book has been developed to be concise and readable, with chapters and community stories that are all deliberately short, and with limited references. However, readers are invited to explore the CCRN website for more detail and extensive references, as well as further readings and multimedia resources.

Community-based approaches for linking conservation and livelihoods

Anthony Charles and Fikret Berkes

This chapter provides a brief review of the historical context of resource management and conservation (section 2.1), followed by an introduction to the concept of community-based conservation (2.2). The international collaboration that led to the present book is discussed in section 2.3, along with the conceptual framework that underlies its approach (2.3.1) and a preview of some of the insights or '**key messages**' that have arisen from more than a decade of studies on communities, conservation and livelihoods (2.3.2).

2.1 Historical background

Historically, at least prior to the 20th century, decision-making about natural resource use and environmental conservation often took place at a relatively local level such as within specific areas or communities (see, for example, Garcia et al., 2014, p. 27, and corresponding references). That changed, especially in the 1900s, with the rise of the modern nation state, as the focus shifted to centralised, top-down governmental decision-making (Garcia et al., 2014).

This shift led, on the one hand, to considerable success in expanding scientific understanding of resources (such as forests and fish), their human uses, and (in theory at least) how those resource uses can be carried out sustainably. On the other hand, there has been a wide range of environmental destruction and resource mismanagement (deforestation, fishery collapse, etc.), notably in the latter part of the 20th century. The causes of these (sometimes) dramatic failures are varied: underlying attitudes about nature, issues of colonial legacy, corporatisation (for example, the post-1970s emergence of vertically-integrated fisheries), failure at adaptive management or lack of 'learning-by-

doing', neglect of knowledge sources other than conventional scientific ones, and more.

All of this has led to a recognition of the inadequacy of current conservation and management approaches, and a serious questioning of conventional top-down management (Charles, 1995, 2001; Berkes, 2021). As a result, recent decades have seen a range of efforts and improvements in how environmental and resource management are approached (Charles, 2017).

Three major shifts along these lines can be highlighted:

Firstly, there has been an appreciation of the benefits of participatory approaches in resource management and conservation, including the idea of joint decision-making or *co-management* (Pinkerton, 1989). This has helped to incorporate the knowledge and capabilities of local resource users into conservation (Berkes, 2018). At the same time, increased awareness has helped to reduce the problem of poor compliance, when rules imposed from the top down are not accepted locally. A shift to participatory management – in which resource-dependent communities share decision-making power and responsibility with the government (Berkes, 2009) – has had major implications for conservation success. We have been witnessing a rapid evolution of science and management practice toward much greater local engagement to better understand and conserve the environment (Charles et al., 2020).

Secondly, the excessive focus on only scientific knowledge, as noted above, has been challenged through the recognition of Indigenous knowledge or traditional ecological knowledge (TEK) by international programs and conventions, and the

need to increase the range of knowledge available to solve problems (Berkes & Folke, 1998; Díaz et al., 2018). Although still in progress, a broadening of knowledge sources – to include Indigenous knowledge, and that of natural resource users, among others – is now increasingly accepted.

Thirdly, there has been a universal recognition of the need for greater attention to local-level community-based conservation and stewardship. Indeed, abundant evidence shows that over the centuries, local ecosystems and resources have been managed successfully at the community level. Many Indigenous and other societies continue in this way, using forms of management that reflect the need to address human issues more fully, in contrast to top-down control (Berkes, 2021). This particular shift in thinking on environmental and resource management is discussed further in the next section.

2.2 Community-based conservation

This book focuses on examining community-based conservation and stewardship – which can be considered as a shorthand for governance that operates 'from the ground up' and deals with interactions across levels of organisations. According to the original definition by Western and Wright (1994, p. 8), community-based conservation "includes natural resources or biodiversity protection by, for, and with the local community". But communities are not isolated from other levels of decision-making and external drivers. Thus, to account for institutional linkages at multiple levels of organisation, such as policies at the national level that impact and shape conservation at the local level, there is a need to consider communities together with their various linkages. The seminal definition of Western and Wright can therefore be extended: "Community-based conservation includes natural resources or biodiversity protection by, for, and with the local community, taking into account drivers, institutional linkages at the local level, and multiple levels of organisation that impact and shape institutions at the local level" (Berkes, 2007, p. 15193).

Community-based conservation is not a panacea. Several decades of community-based conservation experience have produced mixed results, requiring

Local communities in rural areas, such as here in Vietnam, often rely on natural resources for livelihoods, and engage in conservation practices to maintain those livelihoods.
Photo: A. Charles

a reassessment and rethinking (Berkes, 2007). On the other hand, hundreds of contemporary case studies have been brought together, notably by Nobel laureate Elinor Ostrom and others, showing the conditions under which communities can successfully engage in 'collective action' within local commons, reinforcing sustainability linkages between communities and local ecosystems. Overall, the evidence suggests that community-based approaches are most likely to succeed under certain specific conditions:

1   Land and resource rights must be secure, with authority and responsibility devolved to the local level. Such empowerment is necessary for bottom-up management, but also requires capacity development for all players for communication to be effective.

2   Community-based approaches and joint management need to include not only 'participation', but also deliberation involving all of the parties in order to achieve equitable and effective outcomes. Passage of time for social learning and trust development are often necessary as well (Berkes, 2009).

3   Respect for Indigenous elders and other knowledge-holders is necessary before local and traditional knowledge can be used. In this regard, empowering local resource users and communities has the advantage of leading to greater acceptance of conservation measures and thereby improving effectiveness.

4 It is useful to draw on effective community mechanisms to resolve conflicts over resource use. Thus, if communities have developed their own strong local rules and institutions, shared resources (the commons) can be used sustainably.

5 Perhaps most importantly, community-based approaches succeed subject to the basic lesson of commons theory: people and communities are motivated to conserve resources if they are likely to benefit from their own stewardship, their restraint in using available resources (Ostrom, 1990).

These are recurring themes throughout this book.

Whatever the nature of the decision-making, the underlying motivation for local communities and resource users to protect their environment is very often rooted in the reality that individual and collective livelihoods rely on healthy ecosystems (Ommer, 2007; Borrini-Feyerabend, 2010; Charles, 2017). Local ecosystems, through the services they provide – i.e. nature's contributions to people (Diaz et al., 2018) – support communities, and their sustainable livelihoods and social services (such as education and health), and provide the resilience needed to deal successfully with shocks and stresses. For this reason, a community in tune with its environment maintains the capability to draw from that same environment, while at the same time protecting it from negative human impacts. That is why the local community level is where much of the progress in conservation has occurred – even while the attention of governments and international bodies is often placed more on larger-scale national, regional and global approaches.

2.3 The Community Conservation Research Network

The CCRN initiative was established in 2012 as a mechanism to explore community-based approaches for linking conservation practices and sustainable livelihoods. Accordingly, the CCRN focuses on exploring community-based conservation within its international partnership of Indigenous organisations, community organisations, governments, non-governmental organisations (NGOs), universities and other researchers. The two key aims of the CCRN are: i) to understand and support the efforts of local communities around the world to engage in environmental conservation that sustains local livelihoods; and (ii) to address the need for governments to better engage with local communities and Indigenous rights-holders, to support community conservation and livelihood efforts, and to better utilise community knowledge.

To accomplish these aims, the CCRN identifies and promotes best practices in local-level conservation and stewardship (including community initiatives, governance arrangements and policy measures) for long-term sustainability of resources and associated livelihoods.

The work of the CCRN has been two-fold:

■ First, the network has engaged in comparative research across 30 sites internationally, reflecting the wide diversity of local communities around the world. The communities include those that are inland (including forest and agricultural areas, among others) and those that are coastal (including urban, fishing and touristic areas, among others). Table 1 lists all the sites, and Figure 1 shows those sites and the countries where they are located (with some countries having multiple sites). Descriptions of many of the sites are included in the Community Stories part of this book, and many others are available on the CCRN's website.

The initiatives that have taken place at these locations reflect the many different contexts for community conservation and sustainable livelihood initiatives, even though all involve conservation and livelihood linkages at the local level. The studies carried out in each location have been built around longstanding partnerships, often between the local community, communities or regional/Indigenous organisations and external researchers, and involved participatory action research. Typically, the key goals of these partnership arrangements have been to empower local communities through recognition of their local knowledge and values, to further knowledge-building and capacity-building,

Figure 1 CCRN sites
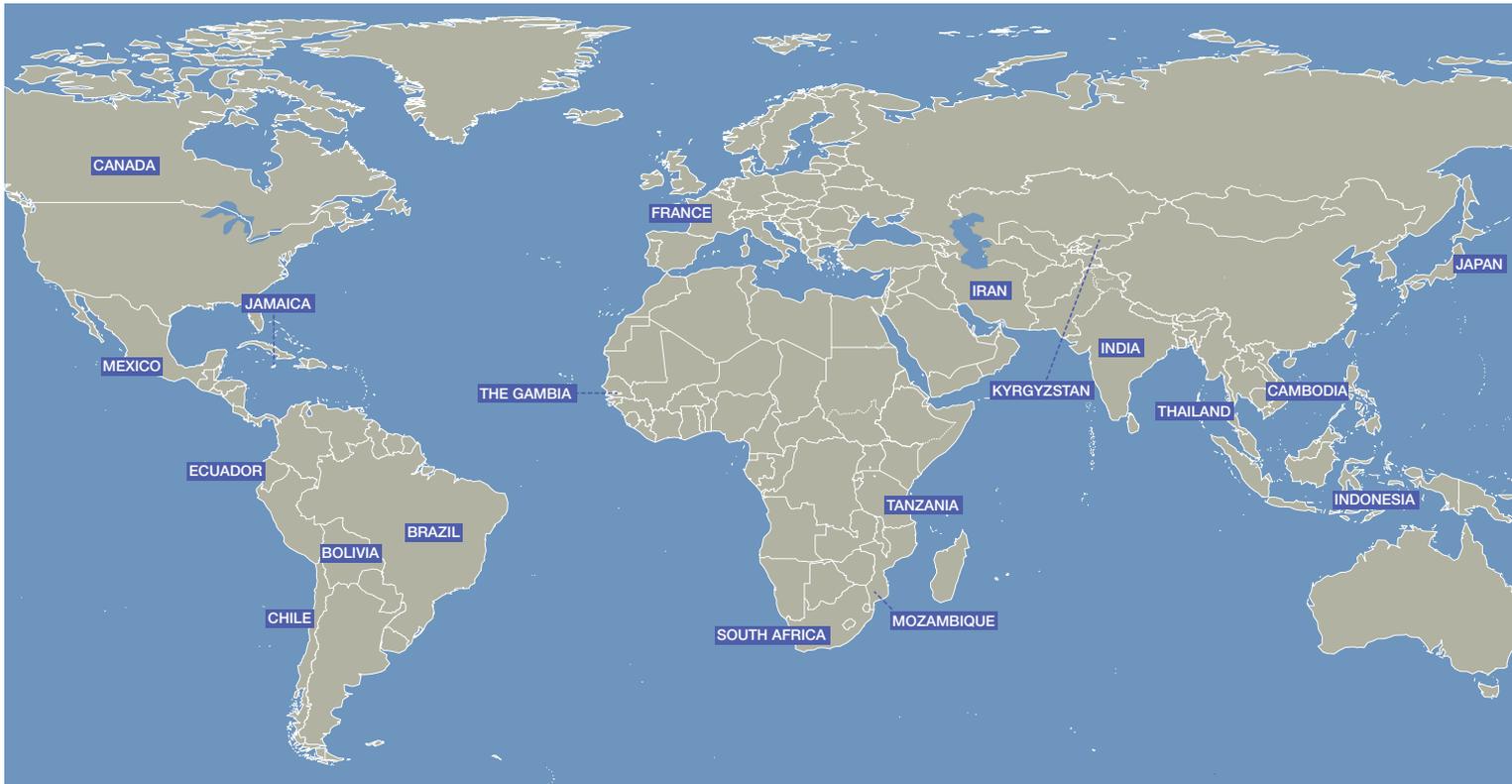
Source of the map: Based on United Nations World Map (2020).

and to develop and highlight policy measures that support those communities.

■ Second, the CCRN has developed a learning and networking platform on the themes of communities, conservation and livelihoods. The platform focuses on local communities around the world, engaging in conservation (stewardship) activities to ensure sustainable livelihoods and healthy local economies. The website displays the results of CCRN studies, as well as a range of materials on local communities linking conservation and livelihoods.

The materials include practical community stories from CCRN sites, together with a full-length documentary, a series of short videos, webinars and animations, guidebooks on governance and SES, and an in-depth set of presentations from the Communities, Conservation and Livelihoods conference (co-hosted by IUCN CEESP and CCRN). There is also an interactive resource, Communities in Action, that spotlights the diversity of community efforts linking conservation and local livelihoods, and is continuously expanding as it receives new submissions from around the world.

The local communities covered in the CCRN's work have been varied – geographically, and in scale and scope. Box 1 offers a prelude to two of the community stories featured in Part II, illustrating two distinct contexts, among many, of CCRN partners: a small-community case (Koh Pitak, Thailand) and a regional example involving multiple communities (the Nuu-chah-nulth Nation, Canada).

2.3.1   CCRN's conceptual framework

The CCRN's local-level, community-based participatory research and capacity building have been grounded using a unified conceptual framework. Based on an SES perspective that recognises the interdependence of human and biophysical components (described in Chapter 3), it typically consists of multiple levels nested within one another.

Table 1 List of CCRN sites (community and region) and sources of community stories

COUNTRY	CCRN SITES	SOURCES OF COMMUNITY STORIES		
		THIS BOOK	CCRN WEBSITE	GOVERNING THE COASTAL COMMONS
Bolivia	Northern Amazon	*	*	
Brazil	São Luiz do Paraitinga and Catuçaba	*	*	
Brazil	Paraty Bay		*	*
Brazil	Vila dos Pescadores, state of São Paulo	*	*	
Cambodia	Koh Sralao	*	*	
Canada	Clayoquot Sound Biosphere Reserve	*	*	
Canada	Nuu-Chah-Nulth Nation		*	
Canada	West Coast Vancouver Island		*	
Canada	Eastern Shore, Nova Scotia		*	
Canada	Halifax, British Columbia	*	*	
Canada	Port Mouton, Nova Scotia			*
Canada	Innu Nation		*	
Chile	Coquimbo Region		*	
Ecuador	Galapagos Islands		*	
France	Delta du Rhône Biosphere Reserve			*
Gambia	Tujereng		*	
India	Odisha		*	
India	Chilika Lagoon	*	*	*
Indonesia	Bali		*	*
Indonesia	Les Village, Bali	*	*	
Indonesia	Haruku Village	*	*	*
Iran	Qeshm Island	*	*	
Jamaica	Bluefields			*
Japan	Tokyo Bay		*	
Japan	Abashiri, Shiretoko, Tokyo Bay, Hiroshima and Ishigaki		*	*
Kyrgyzstan	Ysyk-Köl (Issyk Kul) Biosphere Reserve		*	
Mexico	Mayan Zone (Xmaben and Noh-Cah)		*	
Mexico	Punta Allen, Quintana Roo	*	*	*
Mozambique	Limpopo District		*	
South Africa	Olifants Estuary	*	*	*
South Africa	Tsitsikamma Marine Protected Area	*	*	
Tanzania	Saadani National Park		*	
Thailand	Koh Pitak	*	*	*

Box 1 Summaries of two community stories

Koh Pitak, Thailand

Summarised from *Koh Pitak Island, Thailand Community Story*.

Contributed by Dachanee Emphandu and Philip Dearden

Koh Pitak is a small community on an island off the coast of Thailand. Koh Pitak once enjoyed abundant ocean resources, but over-fishing by themselves and others, as well as habitat damage, led to declining marine resources over several decades. The community saw the need for action to rebuild those resources and safeguard their livelihoods. They acted with respect for local culture and beliefs, with effective participation in decision making and a sense of equity in sharing natural resources. The community took on major stewardship initiatives to protect the island's resources, by creating no-fishing zones in a nearby National Park, reseeding shellfish populations, improving waste disposal and restoring mangrove forests along the coast. They also embarked on an innovative project: developing local tourism in a way that fits with the community's culture, and which was able to reduce their reliance on fishing by diversifying their livelihoods. Finally, from a social perspective, the community worked out a system for sharing fish more carefully among the people, to ensure a fair sharing arrangement. Through the efforts of environmental stewardship, social planning and livelihood diversification, Koh Pitak today has gained healthier ecosystems, a more sustainable economy and numerous positive social benefits.

Nuu-chah-nulth Nation, Canada

Summarized from Foxcroft et al. (2016) and *Clayoquot Sound, Canada Community Story*.

Contributed by Laura Loucks

Indigenous Nuu-chah-nulth people live in several communities on the west coast of Vancouver Island, in the Canadian province of British Columbia. For thousands of years, the Nuu-chah-nulth have been living in coastal ecosystems and watersheds, where their society, economy and culture continue to be deeply connected to their natural resources. Of particular importance for Nuu-chah-nulth communities, in terms of culture, food and livelihoods, is salmon fishing. The Nuu-chah-nulth have developed fishery management plans to benefit their communities and ensure sustainability of fish populations, based on traditional principles of "*iisaak* (living respectfully), *qwa'aak qin teechmis* (life in the balance), and *hishuk ish ts'awalk* (everything is one and interconnected)" (Clayoquot Biosphere Trust, n.d.). While full implementation of community-level stewardship in Nuu-chah-nulth communities has been delayed, since court cases have been underway to ensure recognition of Nuu-chah-nulth resource access rights (Foxcroft et al., 2016), the Nuu-chah-nulth Nation is showing nevertheless how to link together cultural values, stewardship practices and sustainable livelihoods, moving toward those goals with practical conservation efforts at a local and a regional level, even as higher level actions take place.

Figure 2 Social-ecological systems lens
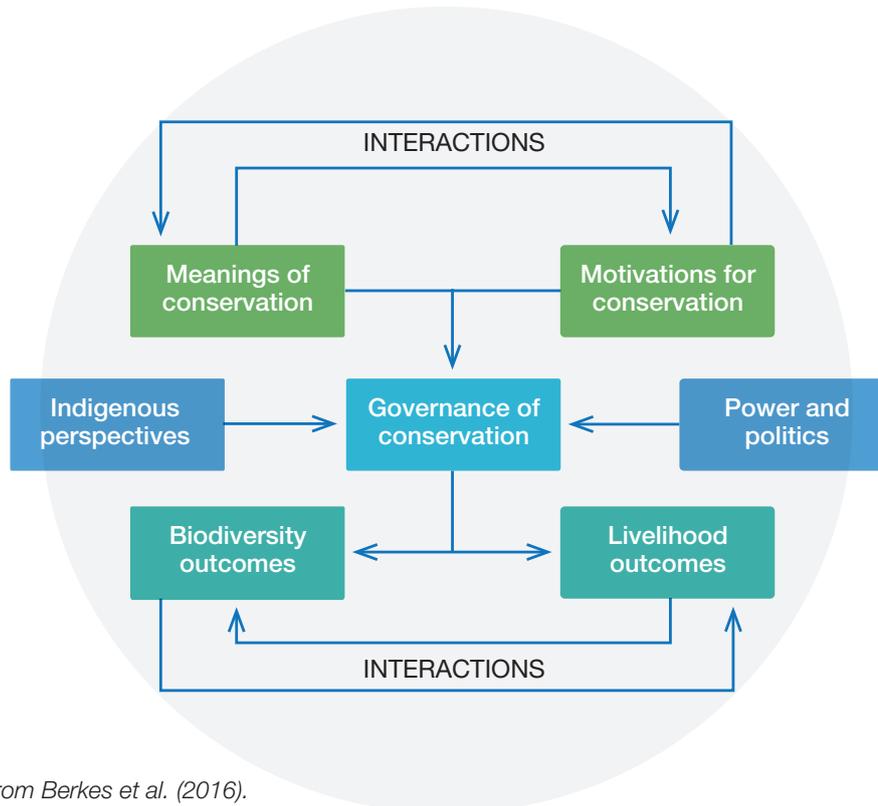
Source: Adapted from Berkes et al. (2016).

As an example of an SES, consider the Japanese concept of *satoyama* (sato = village; yama = hill). This is typically a mosaic of mixed forests, rice paddy, dry rice fields, grasslands, streams and ponds, and coupled systems of humans and nature. More recently, the same concept has been applied on coasts as *satoumi*, a mosaic of coastal ecosystems, together with the people who live and work in them. The concept has been applied in rebuilding Japan after the 2011 earthquake and tsunami, in a manner that was bottom-up, customised by region and centred on local communities.

The SES lens of the CCRN is composed of several components, revolving around the conservation initiatives undertaken by, or involving, local communities:

- The approach focuses first on the diverse meanings of conservation for all players in the system (such as local communities, groups within them and governments), as well as corresponding motivations for conservation (both locally and at higher levels).

- Within an SES lens, processes of governance, and the range of relevant decision-making processes, are then considered, including issues of power and politics, as well as Indigenous perspectives.
- An assessment is undertaken of both biodiversity and livelihood outcomes – notably, what constitutes success for both environment and livelihoods, reflecting an understanding of their crucial importance.

The chapters are organised around these aspects, including the overall SES framework (see Figure 2). The set of community stories provided in Part II is built on these aspects as well.

The conceptual framework led to the identification of models and approaches to assess how community engagement and leadership, as well as government involvement, do or do not lead to success, measured in both biological/ecological and human-focused goals. This understanding can help to empower communities to enhance their natural environments and local economies, and to guide both communities and policy-makers to successful paths of stewardship and livelihood sustainability.

2.3.2   Key insights from CCRN research

Several key results have emerged from the work of the CCRN over the past decade, and from a range of preceding studies, which can provide guidance for communities, policy makers and decision makers at all levels, from local to global. They have been tested through analysis of the results from various CCRN sites, leading to a range of results that have been presented in publications and conferences, and are reflected as well in the CCRN documentary, *Sustainable Futures – Communities in Action*, as well as other videos on the CCRN website.

This book is not about the CCRN itself, but explores the CCRN themes described throughout this chapter, and insights from a decade of collaboration among CCRN participants. The insights are highlighted in detail throughout this book, from multiple perspectives, leading to a full analysis (synthesis) in Chapter 10. As a preview of these results, below are three essential points to bear in mind:

1   Local communities around the world, in cities and in rural areas, are on the frontlines of environmental challenges, providing inspiration as they undertake homegrown stewardship efforts to support sustainable local economies. Given the chance, local communities and resource user bodies can resolve environmental and livelihood challenges, in ways that make a positive difference locally, and may well provide inspiration globally.

2   A **two-way** connection exists between the well-being and livelihoods of local communities, and the health of ecosystems. A healthy environment is crucial for communities. Conversely, strong and cohesive communities make conservation efforts more effective in maintaining healthy ecosystems.

3   Successful stewardship initiatives typically require:

- **Community empowerment and strong relationships**, supporting both local involvement in environmental conservation activities (supporting local livelihoods and economies) and community engagement in larger-scale conservation;
- **Active and meaningful engagement** of local communities and Indigenous rights-holders in environmental and natural resource decision-making and monitoring;
- Adequate attention to **ensuring sustainable livelihoods and local economies**;
- **Supportive governments**, in practice and policy, and recognition of community knowledge;

Reflecting the values of local people, and showing respect for Indigenous and local communities, and their traditional sustainable use and stewardship practices.

Neighbourhoods in cities rely on food sources and public markets, such as here in Zanzibar (Tanzania), for local food security and livelihoods.
Photo: A. Charles

References

Armitage, D., Charles, A., Berkes, F. (eds.) (2017). Governing the Coastal Commons: Communities, Resilience and Transformation. Oxford, UK and New York, USA: Earthscan, Routledge/Taylor & Francis. Available at: https://doi.org/10.4324/9781315688480

Berkes, F. (2007). 'Community-based conservation in a globalized world'. Proceedings of the National Academy of Sciences 104(39): 15188–15193. Available at: https://doi.org/10.1073/pnas.0702098104

Berkes, F. (2009). 'Evolution of co-management: Role of knowledge generation, bridging organizations and social learning'. Journal of Environmental Management 90(5): 1692–1702. Available at: https://doi.org/10.1016/j.jenvman.2008.12.001

_____ (2018). Sacred Ecology. 4th Edition. New York, USA and London, UK: Routledge. Available at: https://doi.org/10.4324/9781315114644

_____ (2021). *Advanced Introduction to Community-based Conservation*. Cheltenham, UK and Northampton, MA, USA: Edward Elgar.

Berkes, F. and C. Folke (eds.) (1998). *Linking Social and Ecological Systems.* Cambridge University Press, Cambridge, UK.

Berkes, F., Arce-Ibarra, M., Armitage, D., Charles, A., Loucks, L., Makino, M., Satria, A., Seixas, C., Abraham, J., Berdej, S. (2016). *Analysis of Social-Ecological Systems for Community Conservation*. Halifax, Canada: Community Conservation Research Network, Saint Mary's University. Available at: https://www.communityconservation.net/resources/social-ecological-systems-guidebook/

Borrini-Feyerabend, G. (2010). *Strengthening what works: recognising and supporting the conservation achievements of Indigenous peoples and local communities*. IUCN CEESP Briefing Note 10. Available at: https://portals.iucn.org/library/node/9672

Charles, A. (1995). 'The Atlantic Canadian groundfishery: Roots of a collapse'. *Dalhousie Law Journal* 18(1): 65–83.

_____ (2001). *Sustainable Fishery Systems*. Oxford, UK: Wiley-Blackwell.

_____ (2017). 'The Big Role of Coastal Communities and Small-Scale Fishers in Ocean Conservation'. In: P.S. Levin and M.R. Poe (eds.), *Conservation for the Anthropocene Ocean: Interdisciplinary Science in Support of Nature and People*, Chapter 21, pp. 447–461. Amsterdam, The Netherlands: Academic Press, Elsevier. Available at: https://doi.org/10.1016/B978-0-12-805375-1.00021-0

Charles, A., Loucks, L., Berkes, F., Armitage, D. (2020). 'Community science: A typology and its implications for governance of social-ecological systems'. *Environmental Science & Policy* 106:77–86. Available at: https://doi.org/10.1016/j.envsci.2020.01.019

Clayoquot Biosphere Trust (CBT) (n.d.). 'Overview'. *CBT* [website]. Available at: https://clayoquotbiosphere.org/about-us/overview

Díaz, S., Pascual, U,. Stenseke, M., Martín-López, B., Watson, R.T., Molnár, Z., Hill, R., Chan, K.M.A., Baste, I.A., Brauman, K.A. et al. (2018). 'Assessing nature's contributions to people'. *Science* 359(6373): 270–272.

Foxcroft, D., Hall, D. and Cowan, L. (2016). *Nuu-chah-nulth Territory, Canada: The Nuu-chah-nulth continue to fight for their aboriginal fishing rights even after these rights were recognized in Ahousaht et al vs Canada (2009)* [website article]. Available at: https://www.communityconservation.net/nuu-chah-nulth-territory-canada/

Garcia, S.M., Rice, J., Charles, A. (eds.) (2014). *Governance of Marine Fisheries and Biodiversity Conservation: Interaction and Coevolution.* Oxford, UK: Wiley-Blackwell. Available at: https://doi.org/10.1002/9781118392607.ch2

Ommer, R.E. (2007). *Coasts under Stress. Restructuring and Social-Ecological Health*. Montreal, Canada: McGill-Queen's University Press. Available at: http://www.jstor.org/stable/j.ctt7zmmg

Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, UK: Cambridge University Press. Available at: https://doi.org/10.1017/CBO9781316423936.001

Pinkerton, E.W. (1989). *Cooperative Management of Local Fisheries*. Vancouver, Canada: University of British Columbia Press.

United Nations Department of Economic and Social Affairs (UN DESA) (n.d.). 'The 17 Goals'. *UN DESA* [website]. Available at: https://sdgs.un.org/goals

Western, D. and Wright, R.M. (eds.) (1994). *Natural Connections. Perspectives in Community-based Conservation.* Washington DC, USA: Island Press.

Chapter 3

A social-ecological systems lens for community conservation

Fikret Berkes*

3.1   Introduction

What is a social-ecological system (SES) lens and why is it important for community conservation? These questions embody the conceptual background of the SES lens addressed in this chapter and explicitly links the 'human system' (e.g. communities, society, livelihoods) and the 'natural system' (i.e. ecosystems) in a two-way feedback (or mutual feedback) relationship. This integration (interlinkage, interconnection) is important. In any conservation effort, the interaction between ecological and social subsystems must be taken into consideration. These links are related to peoples' knowledge (including local and traditional knowledge) and management institutions, as well as rules and norms that mediate how humans interact with the environment (Armitage et al., 2017).

An SES lens is crucial because integrating communities, conservation and livelihoods cannot be accomplished from a narrow perspective. In the SES approach, the unit of analysis is the human system and the natural system together, as an integrated, interacting, intertwined, coupled and often co-evolving system (Ostrom, 2009).

As used here, the SES approach builds on the work of the Millennium Ecosystem Assessment, which was a major international effort to look at the state of ecosystems globally, and the interaction of 'human well-being' and 'ecological services'. IPBES, another major international effort, has built on this approach, examining the interaction between human well-being and 'nature's contributions to people', with an emphasis on the cultural aspects of the relationship

The rural countryside of the Catuçaba district. A community-level social-ecological system.
Photo: Alice de Moraes

and the importance of diverse sources of knowledge (Díaz et al., 2018). The assessments have recognised that humans-in-nature constitute a 'complex adaptive system', which tend to exhibit feedbacks that occur in ways that are not necessarily predictable (Berkes, 2015). The SES lens draws attention to the various characteristics of complex adaptive systems, as described in the next sections. Understanding and working with these various characteristics is essential for the success of community conservation.

3.2 Scale and level

It is useful to make a distinction between scale and level within an SES. Following Cash et al. (2006), 'scale' may be defined as the spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon, and 'levels' as the units of analysis that are located at different positions on a scale. Where space, time and jurisdictional scales are often referred to,

the consideration of multiple levels within a scale is important, for example, in referring to levels of governance. It is often noted that 'high-level' governmental policy should enable innovation and conservation success at the community level, while mobilisation at the community level and horizontal networks among communities at the same level can drive change at those higher levels. The multi-level approach thus helps focus on the different levels at which conservation action can take place.

3.3 Emergent properties

A complex system can exhibit 'emergent properties' – features of a system as a whole that are not apparent when the system is reduced to its parts. Emergent properties are those characteristics that cannot be predicted or understood simply by examining the components of the system. Resilience of an SES is one such characteristic. The idea of resilience is to be able to maintain the overall function and structure of a system of humans and nature, despite unexpected shocks to that system. As conditions change, an SES may cope with or adapt to changes; or it may transform into a different SES. Resilience is an insightful way of thinking about change; coping, adapting and transforming are all aspects of resilience (Brown, 2016).

3.4 Governance

The system of rules, institutions, organisations and networks that help societies prevent, mitigate or adapt to local and global environmental change, or governance, is a crucial ingredient in conservation. An SES lens contributes to thinking about governance by highlighting the importance of conservation-focused institutions and governance arrangements that: (i) match the scale of a particular SES; (ii) adapt as the systems change over time; and (iii) help steer the systems towards sustainability. Key ingredients for success include the presence of multi-level institutions, partnerships among state and non-state actors, appreciation of diverse perspectives and knowledge, and shared learning and social processes that provide opportunities for adaptation (Armitage et al., 2017). Applying the

SES lens to governance helps to: i) examine how power relations, decision-making, and various arrangements can promote conservation; ii) recognise effective and equitable local practices; and iii) inquire how such initiatives or practices can be integrated into higher-level conservation as part of multi-level governance.

3.5 Local-level institutions

Of particular importance for governance are local-level institutions, which have been documented extensively (Ostrom, 2009; Berkes, 2015; Armitage et al., 2017). Nevertheless, there is a lack of understanding about how local institutions can be effective in an environment of multiple economic sectors. Impacted by urbanisation and economic activities, such as recreation, fishing, shipping, mining, hydrocarbon development and others, coastal areas provide a good example of how communities can face conservation challenges from processes originating at other levels. Local-level institutions play a major role in 'multi-level approaches' for good governance, replacing 'top-down' approaches with participatory processes involving local communities, often as partners with civil society organisations, higher levels of government and industry. Success in practice depends on local incentives and acceptance from community-level institutions. Despite many examples of local-level conservation, fundamental gaps remain between theory and practice (Armitage et al., 2017). These challenges hold back the effective meeting of joint socio-economic and environmental objectives.

3.6 The nature of change in social-ecological systems (SES)

SES are never static, as they are always changing. Certain key characteristics of working with SES reflect a dynamic reality consisting of: drivers, feedback, thresholds and transformation:[6]

Drivers. A broad range of factors lead to changes in SES. The Millennium Ecosystem Assessment defines a 'driver' as any natural or human-induced factor that directly or indirectly causes a change in an SES.

6   For further reading, please see Berkes et al. (2016).

A direct driver (i.e. changes in local resource use) is one that can be identified and measured. Indirect drivers (i.e. demographic change) operate more diffusely, often by altering one or more direct drivers. Identifying drivers is a major part of the SES analysis.

Feedback. Complex adaptive systems have feedbacks that can be either self-reinforcing or self-moderating (self-correcting). If a loop (i.e. an interaction between components) in the SES *sustains* the direction of change, it is called a positive (reinforcing) feedback. If it reverses (or tends to reverse) the direction of change, it is called a negative (balancing or stabilising) feedback. As with drivers, identifying feedbacks is an essential part of the SES analysis.

Thresholds. The resilience of an SES is related to whether or not the system crosses certain thresholds or 'break points' (or tipping points) between two alternate states or system configurations. When crossed, thresholds can involve sudden and dramatic change. Thresholds may be related to the ecological system or the social system or both. Unlike drivers and feedbacks, thresholds can be very difficult to identify: we know they are present but not exactly when or where (i.e. how much harvesting will lead to crossing the threshold to overfishing).

Transformation. In some cases, social, economic, political and ecological conditions change in such a way that an existing SES cannot be maintained by coping and adapting. The resulting change may be a fundamental or systemic shift in the SES, referred to as transformation (Brown, 2016). A diversity of transformative changes has been documented, involving trust-building, mobilising social networks, collaborative learning, change of values, and creating public awareness as part of the transformation process (Armitage et al., 2017).

3.7 Focusing on the social system

Certain core concepts of SES focus specifically on the social aspects, including worldviews, collective action, and power and agency. Incorporating these into community conservation increases the chances of success.

A river and mangrove social-ecological system harvested by community-level small-scale fishers, in Koh Sralao (Cambodia).
Photo: F. Berkes

Worldviews. Every culture has its own way of thinking about the world and the functioning of the universe. A worldview entails a complex of knowledge, practice and belief (Berkes, 2015). Understanding the worldview in which a local or traditional management system is embedded is of paramount importance in the practice of community conservation. Existing local stewardship often depends on the worldview of a community or society. This becomes especially relevant when focusing on meanings of conservation, motivations for conservation, and conservation outcomes.

Collective action. Any action taken together by a group of people whose goal is to enhance their status and achieve a common objective is called collective action. The theory of collective action suggests that people will only be motivated to cooperate under conditions in which the benefits from cooperating exceed individual costs, and the problem of free-riding is resolved. When individuals repeatedly communicate with one another in a localised setting, they learn whom to trust and how to organise for collective action. However, barriers to collective action can arise when social capital is eroded and people develop a sense that not everyone can be trusted to behave consistently for collective benefit.

Power and agency. Power is the ability to influence outcomes; agency is the ability of individuals or groups to undertake actions despite constraints imposed by larger social structures. Power and agency are relevant to SES because they are about how conservation is shaped, and who has access

to benefits. Conservation is not about natural resources only, but rather about the relationships between different actors, wherein power relations and leadership become important. Conservation initiatives can be arenas of conflict that result in unsustainable outcomes. Moreover, issues of power frequently occur. Conservation is often associated with the control of resources that have been wrested from the local people by state and global interests for preservation at the expense of local livelihoods.

3.8 Highlighting linkages between ecosystems and governance

In light of these various considerations, Figure 3 shows a schematic diagram of the SES approach. Four parts can be distinguished. The left-hand side is the natural resource system, providing ecosystem services to humans. On the right-hand side is the social system, including resource users and communities that interact within a governance system. The governance system includes all the decision-making about resource use and management. The feedback between two main parts is shown by the interactions (top and bottom arrows) between the ecological side of the SES and the social side. The CCRN themes of meaning, motivations and outcomes are shown in the middle, connecting the two sides of the SES.

The diagram indicates that an analysis involves understanding and describing the components and connections. Concretely, it may also involve determining the drivers, feedbacks and other system concepts described in this chapter, as well as addressing the social system concepts of worldviews, collective action, and power and agency, indicating how these may affect the various components and their interactions. The case study of seagrass bed re-planting in Tokyo Bay illustrates how these concepts are applied (Box 2).

3.9 Conclusions

This chapter has highlighted the importance of using an SES lens, and its various core ideas and approaches in community conservation. Notably, the Tokyo Bay case exemplifies collective action at work, where the divers showed agency and

Figure 3 Social-ecological system for community conservation
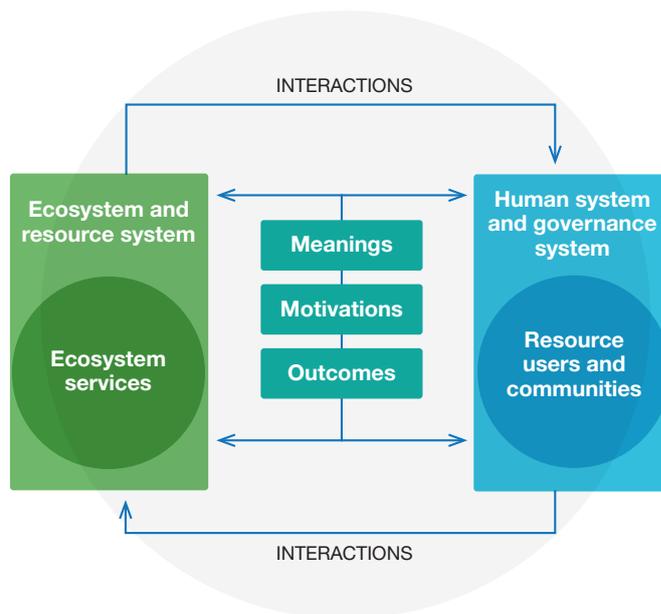
Note: This figure, developed by a CCRN team (Berkes et al., 2016), shows in broad terms the natural system (resource system) in interaction with the human system and the governance system.

leadership, and various groups came together in an alliance that shaped governance by compelling the different levels of government to contribute resources. The famous woodblock prints from the early 19th century help illustrate the meaning of conservation in the Japanese worldview, that the bay is an SES with people intertwined with the natural environment. As the bay changed over time, various drivers resulted in environmental degradation, but other drivers subsequently led to a transformation towards sustainability through community-initiated conservation. The Tokyo Bay case exemplifies the fundamental essence of the SES approach, without going into the full detail of system properties and other elements described in Figure 3. The integration of humans in nature shows that people have the capability to despoil their environment – but also to restore it. Such restoration is both ecological and social/cultural; in Tokyo Bay, it borrows from a worldview that informs community conservation where people are part of a healthy ecosystem.

Box 2

Seagrass re-planting in Tokyo Bay

Contributed by Mitsutaku Makino

Woodblock prints (ukiyoe) of Tokyo Bay from the early 19th century, showing people integrated with the coastal environment. For further reading, please see Makino (2018).

Since the 17th century, Tokyo Bay has been famous as a production area of high-quality fish for sushi. According to maps of fishing grounds from the late 19th century, the majority of the coastal areas were tidal lands with shallow bottoms covered by seagrasses. The pictures of famous woodblock prints (Ukiyoe) of Tokyo Bay (see illustrations) printed in the early 19th century, show people living along the coast, catching/farming sea foods and enjoying boating.
Since the 19th century, Tokyo Bay has been developed and reclaimed, especially in the 1960s when the national government promoted heavy industry development. As the main driver of Japanese economic growth in the 1960s and the 1970s, Tokyo Bay has become one of the most urbanised bays in the world. In Yokohama, Japan's second largest city facing the west coast of Tokyo Bay, only 500 m remain of the original 140 km total natural coastline. As a result, seagrass beds crucial for the eggs and juvenile stages of fish and shellfish have almost entirely disappeared.

In 1981, a group of scuba divers started a sea-bottom clean-up, and local researchers started experimental re-planting of sea grasses. Local fishers then established a no-take zone to help speed up recovery and restoration. More recently, local residents, schools, environmental NGOs, private companies and others joined the re-planting. Interaction with high-level policy was an integral part of the restoration effort. Formal alliances among the above groups were established, and governments at various levels (city, fisheries agency, Cabinet office) started financially supporting the alliance starting from about 2003 onwards.

The activities of local people and others, supported by various levels of government, have successfully expanded the seagrass-covered areas of Tokyo Bay. At the same time, it is well accepted that local people's lives are not something to be eliminated from the ecosystem, but rather are an indispensable component of the ecosystem.

References

Armitage, D., Charles, A., Berkes, F. (eds.) (2017). *Governing the Coastal Commons: Communities, Resilience and Transformation*. Oxford, UK and New York, USA: Earthscan, Routledge/Taylor & Francis. Available at: https://doi.org/10.4324/9781315688480

Berkes, F. 2015*. Coasts for People. Interdisciplinary Approaches to Costal and Marine Resource Management*. First edition. New York, USA: Routledge. Available at: https://doi.org/10.4324/9781315771038

Berkes, F., Arce-Ibarra, M., Armitage, D., Charles, A., Loucks, L., Makino, M., Satria, A., Seixas, C., Abraham, J., Berdej, S. (2016). *Analysis of Social-Ecological Systems for Community Conservation*. Halifax, Canada: Community Conservation Research Network, Saint Mary's University. Available at: https://www.communityconservation.net/resources/social-ecological-systems-guidebook/

Brown, K. (2016). *Resilience, Development and Global Change*. First edition. London, UK: Routledge. Available at: https://doi.org/10.4324/9780203498095

Cash, D.W., Adger, W., Berkes, F., Garden, P., Lebel, L., Olsson, P., Pritchard, L. and Young, O. (2006). 'Scale and cross-scale dynamics: governance and information in a multilevel world'. *Ecology and Society* 11(2): 8. Available at: https://doi.org/10.5751/es-01759-110208

Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R.T., Molnár, Z., Hill, R., Chan, K.M.A., Baste, I.A., Brauman, K.A. et al. (2018). 'Assessing nature's contributions to people'. *Science* 359(6373): 270–272.

Makino, M. (2018). *Abashiri, Shiretoko, Tokyo Bay, Hiroshima, and Ishigaki, Japan: Five Communities Practicing Coastal Ecosystem Conservation*. Halifax, Canada: Community Conservation Research Network, Saint Mary's University. Available on-line at: https://www.communityconservation.net/wp-content/uploads/2016/08/Japan-Community-Story.pdf

Ostrom, E. (2009). 'A General Framework for Analyzing Sustainability of Social-ecological Systems'. *Science* 325(5939): 419–422. Available at: https://doi.org/10.1126/science.1172133

Chapter 4

Meanings and motivations: communities and conservation

Merle Sowman, Wayne Rice, A. Minerva Arce-Ibarra and Ivett Peña-Azcona

4.1 Introduction

As resource managers, researchers and communities look for solutions to the increasing rates of species extinction, habitat destruction, biodiversity loss and destruction of cultural heritage and livelihoods, interest in understanding the meanings of and motivations for conservation has increased over the last few decades. The continued degradation of the environment and increasing evidence of the negative social impacts of conservation programmes worldwide have raised questions about the effectiveness of conventional conservation management, which is dominated by state-centric, science-based and regulatory approaches.

Conservation and natural resource management agencies are mandated to focus on meeting ecological goals and international conservation 'targets' or 'obligations', often to the detriment of the livelihoods and culture of local and Indigenous communities. Several of these communities have suffered from significant impacts as a result of conservation initiatives, including being dispossessed of their lands or restricted from gaining access to ancestral sites or traditional resource areas with devastating consequences.

For most Indigenous peoples, cultural identity and environment are intertwined and indivisible (Watters, 2001/2002; Puc-Alcocer et al., 2019). Their relationship with their traditional lands and waters is intrinsic to their well-being as well as to their cultural survival (Jentoft et al., 2003). Typically, local and Indigenous communities have long-standing customary systems of resource use and governance that regulate access, use and involve resource users in management decisions. Understanding

how 'conservation' is perceived and what motivates different people and communities to conserve the environment or act as stewards of resources is necessary to inform conservation policies, approaches and practices.

4.1.1 Meanings of conservation

As a baseline for this chapter, an assessment was made of the extent to which the meanings of conservation were addressed within the studies of 30 sites by the CCRN. This was done using a qualitative scale based on whether meanings were addressed explicitly, implicitly or not at all, within either (a) the study's research objectives, or (b) information provided by researchers either in the CCRN database or in the corresponding community story. It was determined that 26.7% (n=8) of cases addressed meanings of conservation explicitly, 60% (n=18) addressed it implicitly, and 13.3% (n=4) of cases did not address meanings.

Research shows that the meaning of 'conservation' differs amongst, and within, the different rights-holders, user and stakeholder groups associated with a particular resource(s). The different meanings ascribed to the notion of conservation were evident in several of the CCRN sites examined. For example, it has been found that Indigenous communities like the Zapotec and the Maya from Mexico have local Indigenous terms that refer to local practices of caring for landscapes and which incorporate cultural values and worldviews (Peña-Azcona, 2015; Puc-Alcocer et al., 2019). For the Zapotec, "caring is for using", wherein their relationship with the land and resources is reproduced in their practices rather than in any ´conservation´ rhetoric. For the *Nuu-chah-nulth,* an Indigenous Nation living on Vancouver Island, Canada, the natural environment is

considered to be intrinsic to their culture and identity and conservation is not perceived as a management activity. However, meanings and motivations may differ across communities and socio-ecological and cultural contexts as well as within communities living in a particular geographical space.

4.1.2 Local and Indigenous community 'motivations'

A similar analysis of CCRN cases was carried out to examine whether motivations were addressed explicitly, implicitly or not at all. The analysis finds that 50.0% (n=15) of the cases addressed motivations explicitly, whereas 46.7% (n=14) addressed the topic implicitly, with only one case study not addressing motivations.

Motivations for conservation that are more personal and associated with values, ethics, belief systems and worldviews – as well as cultural norms, attachment to place, customary livelihood practices and perceptions of nature – are referred to as 'intrinsic', or internal motivations. However, these intrinsic motivations are influenced and mediated by a number of 'extrinsic', or external factors (such as political history, tenure rights, people's vulnerability context and awareness of international conservation goals), as well as coercive factors (such as fines and arrests), and economic incentives associated with many conservation programmes and projects. Whilst recognising and securing legitimate tenure rights is an important contributing factor to fisheries and conservation management (FAO, 2014), there are other important cultural, ethical and socio-economic motivations that have emerged as key to community conservation efforts.

Research conducted by the CCRN offers insights into what motivates local and Indigenous communities to conserve natural resources and landscapes over and above coercion and punitive measures and economic incentives. Findings from the 30 CCRN sites emphasise the importance of four key local and Indigenous community 'motivations':

1   Firstly, in several of the cases local and Indigenous, **cultural institutions** are inextricably linked to their environmental and natural resource use practices, with which they have been engaged in for generations.

2   Secondly, an **attachment to place – land, sea, natural resources and attributes** – involves an intimate 'attachment' to and 'sense of place'.

3   Thirdly, **socio-economic needs** of local and Indigenous communities are often linked to maintaining a healthy ecosystem and deriving a much-needed source of livelihood.

4   Finally, an **ethical responsibility** to take care of the earth, prevent degradation of the environment and use resources sustainably, endures in many local and Indigenous communities and is key to motivating conservation practices.

Accordingly, this chapter will focus on the above-mentioned four key local and Indigenous community 'motivations'. A further assessment of the case study database and community stories indicated that a large majority of the cases included each of the four types of motivation, with roughly equal frequencies (100%, 100%, 96.6% and 93.1%, respectively, of cases covering the four types of motivation).

Cultural institutions

Different cultures have different and often unique ways of perceiving and relating to their environment, with equally diverse understandings that influence their actions and behaviour. However, little attention has been paid to the influential role of cultural institutions (i.e. values and belief systems governing communities) in garnering support for conservation. This is notable since there are many examples where Indigenous Peoples regard 'conservation' as internal to their culture and daily practices. This was evident in well over half of the CCRN case study sites. For example, the continued central role of cultural institutions is demonstrated in the cases of the Indigenous *Nuu-chah-nulth* people of Vancouver Island, Canada and the *Maluku* people of Haruku Island, Indonesia.

A fundamental concept to the Nuu-chah-nulth is *hishukish ts'awalk*, which translates to 'everything is one, everything is interconnected and nothing exists

without the other'. It illustrates interdependence and connection with their environment. The concept has installed an intrinsic sense of 'cultural pride' in the community, which has led to their continued contestation for their Aboriginal fishing rights.

The Maluku people continue to practice *sasi laut*, a cultural institution regulating the management of coastal resources based on their cultural knowledge, norms and value systems. Central to this belief is a recognition of the interlinked relationship between the marine and land environment, which includes the 'social system of society'. However, *sasi laut* as a cultural institution does not operate alone and has been weakened by external and internal pressures from other resource management institutions.

Safeguarding resources for future generations to maintain cultural traditions is key. For example, fishers from the Tsitsikamma area in South Africa consider being able to walk to traditional fishing spots and catching fish for a special Sunday meal as is an integral part of their culture and community.

In general, cultural values and institutions are not integrated into 'modern' conservation institutional arrangements and approaches. For instance, in the case of the Ysyk-Köl (Issyk Kul) Biosphere Reserve in Kyrgyzstan, a lack of integration of sacred sites into conservation approaches has been observed (Samakov, 2015). Moreover, it should be acknowledged that while cultural institutions remain influential, they constantly evolve in complex and unpredictable ways in response to countless internal and external factors (see, for example, the community story on Haruku village, Maluku Province, Indonesia, in this book).

Attachment to place

A strong connection to a place can influence conservation motivations in local and Indigenous communities, as illustrated in the following examples.

In the **northern Amazon region of Bolivia**, local community fisheries have undergone several changes, such as the introduction of a new fish species, *paiche,* and the emergence of a local commercial fishery sector. The urban-based

Conservation practices are often linked to traditional activities, such as this canoe race of the Caiçara people on the Brazilian coast.
Photo: Ana Carolina Esteves Dias

commercial fishers are thought to be motivated by financial interests, including targeting newly introduced marketable species, due to substantial investments in fishing gear (especially boats), whilst local Indigenous fishers with lower mobility have more **place-based** motivations to conserve native species deemed more culturally acceptable to their diet.

In the **Chilika Lagoon of India**, a customary fishery influenced by the Hindu caste system, fishers possess a strong sense of attachment to their environment, as illustrated by a commonly used fisher phrase, "Maa [Mother] Chilika is crying", in response to the current ecological state of the lagoon.

A strong connection with nature is also observed amongst fishers of the **Olifants Estuary, located on the west coast of South Africa**. Previously marginalised, fishers there have a long history of traditional fishing, which has led to a strong sense of belonging and attachment to the river system. This is clearly articulated by fishers when they say, "The river is the heart of the fishing people", "we were born from the river" and "you feel it in your blood… its part of who you are".

A sense of attachment to place or natural elements is equally relevant to many local and Indigenous community members of the **Ysyk-Köl (Issyk Kul) Biosphere Reserve in Kyrgyzstan**, who still possess a strong connection to and respect for the sacred sites in the area.

These examples illustrate how attachment to place can motivate conservation in local and Indigenous communities. Nonetheless, the current challenge of 'cultural erosion' in communities due to globalisation and market-based influences cannot be ignored.

Socio-economic needs

The potential to influence community conservation motivations, by providing increased opportunities for tangible benefits and improvements to socio-economic status, is broadly recognised. However, when conservation becomes a commodity, it may be problematic since community motivations for conservation are not exclusively based on protecting livelihoods for the future, but are also informed by cultural institutions, attachment to place and an ethical obligation to their environment. Thus, the challenge is how to balance socio-economic needs, cultural rights and conservation.

In the case of the Maluku people of Indonesia, the introduction of non-extractive economic development in the form of marine tourism is thought to have largely preserved cultural conservation motivations. Another example of trying to achieve this balance can be found in the case of the Samudram Women's Federation (SWF) of Odisha, India (Zachariah-Chaligne, 2015). Although supported by a local ethical view of conservation, financial and social incentives are largely responsible for motivating marine turtle conservation, within the local community.

In the same respect, it is important to note that socio-economic motivations may differ within communities. For example, the Bolivian case depicts the subsistence needs of local Indigenous fishers on one hand, and on another the financial needs of local urban-based commercial fishers. Similarly, the fishers of Chilika Lagoon, while referring to its social-cultural and economic importance, commonly state that "Chilika was our *bhata handi* [rice pot], and our local bank [fish as cash]". Interestingly, the fishers themselves suggest that they could easily manage without cash, if they have plenty of fish in the lagoon (i.e. their bank).

Therefore, it becomes clear from these cases that socio-economic needs remain important and require consideration within any conservation initiative, since they can be diverse within communities, and have a variable impact on conservation motivations.

Ethical responsibility

A 'duty of care', or ethical conservation motivation, is often at the core of local and Indigenous communities. A few examples illustrate this finding:

- In the case of the Nuu-chah-nulth, whose fishing rights have not been 'respected' by the State, conservation of resources remains a core principle. As mentioned earlier, their belief in 'everything is one' dictates that taking care of the resources is taking care of themselves and vice versa.
- This ethical responsibility is also evident in the case of the fishers of the Olifants Estuary, captured by one fisher as follows, "Our forefathers have protected this river for generations … and we need to protect it as we would protect our own mother." (Sowman, 2017).
- As noted in the community story on Haruku village, Maluku Province, Indonesia, "**sasi laut** is a form of traditional institution regulating the management of coastal resources based on the knowledge, norms and value systems of the Indigenous people of Maluku", and "has been implemented by the Harukunese for over 400 years". The importance of maintaining this cultural institution is prominent among local leaders and communities who consider maintaining *sasi laut* as similar to maintaining the sustainability of their natural resources, since protecting natural resources will result in their abundance.
- In the case of the Bolivian Amazon region, the threat to native fish species from an introduced species, *paiche*, was an issue of deep concern to Indigenous communities, despite the possibilities for expanding and enhancing livelihood opportunities for local fishers.

4.2 Conclusions

There are different meanings associated with the term conservation in different cultural contexts. The Western notion of conservation has a strong focus on restricting access to and protection and stewardship of resources, whereas in many Indigenous and local communities, cultural identity and practices are inextricably linked to relationships with the use and conservation of resources and the environment.

In local and Indigenous communities, conservation relies mainly on customary institutions and cultural values, including the community's own laws, norms, customs, traditions and institutions, for governing resource access, use and management. These cultural assets influence local meanings and motivations for conservation, which in turn determine local support for conservation initiatives. Attachment and connection to place were also strong motivators for conservation behaviour. Economic incentives, such as tangible benefits and improvements to socio-economic status, were also found to influence community conservation motivations. Therefore, an awareness of the meanings and motivations that guide conservation behaviour in local contexts, and a respect for the customary and cultural institutions that inform resource access, use and governance, are critical to promoting conservation outcomes that are socially just and ecologically sustainable.

References

Food and Agricultural Organization (FAO) (2014). *Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty.* Rome, Italy: FAO. Available at: http://www.fao.org/3/a-i4356en.pdf

Jentoft, S., Minde, H. and Nilsen, R. (2003). *Indigenous Peoples: Resource Management and Global Rights*. Utrecht, The Netherlands: Eburon Academic Publisher.

Peña-Azcona, I. (2015). *Percepción socio ambiental de las Áreas Destinadas Voluntariamente para la Conservación en el Istmo Oaxaqueño* (Socio-environmental perception of the Voluntarily Designated Areas for Conservation in the Oaxacan Isthmus). MSc dissertation (Natural Resources and Rural Development). El Colegio de la Frontera Sur, San Cristóbal de las Casas, Chiapas, Mexico. Available at: https://ecosur.repositorioinstitucional.mx/jspui/bitstream/1017/1431/1/100000001628_documento.pdf

Puc-Alcocer, M., Arce-Ibarra, M., Cortina-Villar, S., Estrada-Lugo, E.I.J. (2019). 'Rainforest conservation in Mexico's lowland Maya area: Integrating local meanings of conservation and land-use dynamics'. *Forest Ecology and Management* 448: 300–311. Available at: https://doi.org/10.1016/j.foreco.2019.06.016

Samakov, A. (2015). 'Sacred Sites: Opportunity for Improving Biocultural Conservation and Governance in Ysyk-Köl Biosphere Reserve, Kyrgyz Republic'. Masters dissertation (Master of Natural Resources Management). Faculty of Graduate Studies of the University of Manitoba, Winnipeg, Canada. Available at: http://hdl.handle.net/1993/30911

Sowman, M. (2017). 'Turning the Tide. Strategies, innovation and transformative learning at the Olifants estuary, South Africa'. In: D. Armitage, A. Charles, F. Berkes (eds.), *Governing the Coastal Commons: Communities, Resilience and Transformation*. Oxford, UK and New York, USA: Earthscan, Routledge/Taylor & Francis. Available at: https://doi.org/10.4324/9781315688480

Watters, L. (2000/2001). 'Indigenous Peoples and the Environment: Convergence from the Nordic Perspective'. *UCLA Journal of Environmental Law and Policy* 20 (2): 237–304.

Zachariah-Chaligne, A. (2015). 'Orissa, Odisha, India: The Role of Samudram Women's Federation in Reducing Poverty and Protecting Resources'. *CCRN Community Stories* [website]. Available at: https://www.communityconservation.net/odisha-india/

Chapter 5

Biodiversity outcomes of community conservation

Philip Dearden, Bruce Downie, Juan Carlos Seijo and Anthony Charles

5.1   Introduction

The increasing erosion of biodiversity is one of the greatest challenges facing humankind. The Convention on Biological Diversity (CBD) is an international treaty, signed in 1993, that focuses on trying to stabilise the trend. A cornerstone of the effort is the expansion of protected area systems, where a priority is placed on recovery and conservation of animal and plant populations, as well as ecosystem functions and services, to reach sustainable levels. The CBD's Aichi Targets call for such protected area networks to cover 10% of the marine environment and 17% of the terrestrial by 2020 (CBD, 2010).

To encourage the achievement of the targets and recognise areas where biodiversity is conserved but that are not part of formal protected area systems, the CBD created, in 2010, a new category of area to be included in the totals – other effective area-based conservation measures (OECMs). OECMs are defined as "a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values" (CBD, 2018, p. 48).

The perceived strengths and weaknesses of OECMs, in terms of adding to biodiversity conservation, have been addressed by researchers such as Jonas et al (2018). At one end of the scale, governments may merely seek to strengthen resource use closures, where poor management has led to resource and biodiversity collapse, into OECMs to help achieve their commitments to the CBD, as the case of

fisheries in Canada (Lemieux et al., 2019). At the other end of the scale, there may be tribal parks, for example, that are more fiercely protected and effective in biodiversity conservation than any distantly-administered government park. It is this side of the spectrum, i.e. a range of community conserved areas, which is the focus of this chapter.

5.1.1   Communities and biodiversity conservation

Many community-conserved areas fall under the category of OECMs and still seek legitimacy from government. They may have been protected by the community for generations but still remain vulnerable to government take-over or resource exploitation. They may also be more recent, with the community realising that it has to act to protect its own resources and use them wisely. In either case, a key challenge lies in obtaining external recognition, which in turn requires: i) establishing whether the area actually protects biodiversity; ii) if so, determining how this is done; and (iii) implementing ways to know if it succeeds.

In considering the first step, a cautionary note is in order. A study of Langtang National Park in Nepal (Fox et al., 1996) found that conflict had arisen related to grazing in the park by local villagers. When livestock grazing was accommodated by the park, there was a reduction of conflict between the park and the local communities, and among the communities. Unfortunately, however, the red panda (the species the park had been established to protect) was adversely affected by the grazing and rapid declined. From a social perspective, accommodating the grazing demands of local villagers looked good; from a biological perspective, it was undermining the survival of the species the park

Community initiatives to conserve biodiversity produce important outcomes around the world, as in this sacred forest of Mozambique.
Photo: Almeida Sitoe

had been created to protect. This example illustrates the critical line between development initiatives that do, or do not, enhance biodiversity conservation. "The problem in terms of biological diversity is not that the grazing lands are not managed, but that no one speaks for the red panda" (Fox et al., 1996, p. 568).

Biodiversity outcomes of community conservation have been demonstrated by a range of studies in different environments around the world. There are at least two reasons why it is important to focus on biodiversity: i) valid community development initiatives can take place that do not aim to improve biodiversity conservation; and ii) among those initiatives that do have the biodiversity focus, there is still a wide range of possible strategies, from activities designed to have a direct impact on biodiversity (i.e. cessation of hunting/collecting a given species) to activities that seek to enhance incomes and thereby reduce dependence on extractive activities detrimental to biodiversity conservation.

This chapter discusses two sources of data on connections between biodiversity outcomes and local communities, within the various cases examined by the CCRN. The following section discusses the results of a survey of CCRN researchers, carried out in 2018, on biodiversity objectives and outcomes, producing results for a significant majority of the CCRN's sites. The second part of the analysis examines a somewhat larger set of self-reported case studies in the CCRN database, comprised

mainly of (a) community stories on the CCRN website and (b) cases described in Armitage et al. (2017).

5.1.2 Biodiversity conservation as a primary objective

Citing the red panda example earlier, the fundamental question is whether or not the key implication is being heard and addressed. Many conservation concerns and outcomes documented in the CCRN case studies could be considered as secondary or indirect, so the survey of biodiversity objectives was conducted to highlight cases where biodiversity conservation, in its most concrete form, was considered a primary objective.

The survey asked: (1) whether biodiversity conservation was a primary or secondary objective in the respective locations; and (2) whether conservation was approached directly or indirectly. Of the 18 responses from CCRN researchers, seven indicated that conservation was a primary objective. In one case, where biodiversity conservation was stated as a primary objective, it appeared to take an indirect route, with a focus on establishing a more sustainable and just use of natural resources (Foxcroft et al., 2016). Meeting these objectives may contribute considerably to biodiversity conservation, despite being a more indirect route, compared to other projects which focus directly on biodiversity itself. An example of the latter involves a process of assessing direct biodiversity impacts of ocean uses (Seijo & Headley, 2020). The direct/indirect distinction does not suggest that indirect approaches have a lesser impact on biodiversity than direct approaches, but it is useful to understand the subtle difference in perspectives. Furthermore, in some cases, survey respondents may have biodiversity conservation as an overall goal, yet do not express this explicitly in a statement of objectives.

From the survey results, community initiatives – whose **primary goal** was biodiversity conservation – identified specific conservation objectives, including:

- to protect and/or restore species populations;
- to detect and understand changes in species and habitats;
- to relate impacts to human activities; and

- to understand the role of traditional ecological knowledge (TEK) in understanding habitats/species.

Significantly, the objectives contrast with initiatives whose primary goal was social, and focused on: participation in governance; building local knowledge of conservation; and interactions within SES, including livelihood implications and adaptations.

The rationale for projects whose **primary goal** was biodiversity conservation included:

- ongoing research interests;
- degradation of environments and loss of species abundance;
- conflict among users;
- reducing human impact;
- improving access rights to resources; and
- over-fishing.

Community objectives were being met by a number of activities, including: data collection and monitoring; formulating action plans; and building public awareness and engagement processes. Concerning monitoring, the following activities were reported: informal processes of observation; periodic data collection; and workshops with stakeholders.

5.2 Conservation concerns and outcomes

To consider the nature of conservation objectives and outcomes in a broad sense, a text analysis was carried out on the set of CCRN case studies (community locations). The focus was on the main conservation concerns reported in each case study; a total of 28 cases were examined, and 46 concerns were identified (with many case studies indicating multiple concerns). These concerns were then categorised by identifying sets of related concerns. For instance, the use of poison, such as cyanide, for catching marine ornamental fish, environmental damage caused by sand dredging and impacts of deforestation were grouped together as 'destructive resource use'. This category was considered separate from 'resource over-exploitation', which involves over-use of resources but not destructive use per se. Similarly, although the category

'destructive resource use' covers ecosystems and habitat because it specifically involves natural resources, it was assigned to a different category from concerns of 'quality of ecosystems and habitat', which broadly relate to marine and terrestrial ecosystems and habitats.

In the course of this process, seven categories were identified: i) environmental impacts (environmental degradation, unsustainable development and pollution, both chronic and disaster-based); ii) quality of ecosystems and habitat; iii) resource over-exploitation, (iv) destructive resource uses; v) improving resource management; vi) climate change (seasonality and drought); and vii) exotic and endangered species. The frequencies of these concerns are shown in Figure 4.

The results reflect the particular cases examined here, which overall had a rural and resource-based emphasis. As a result, we see that the three categories dealing with natural resources (over-exploitation, destructive use, and management) dominate with a total count of 25 out of the 46 concerns expressed – and arising in about three-quarters of the locations. Another main set of concerns lies in the first two categories, e.g. environmental, ecosystem and habitat impacts, with a combined count of 15, arising in just over 50% of locations.

Figure 4 Frequencies of conservation concerns
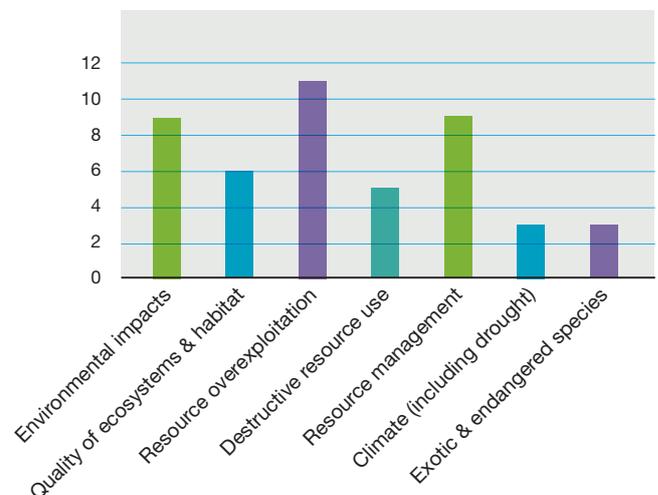
Source: Authors.

Figure 5 **Frequency of anticipated conservation outcomes**
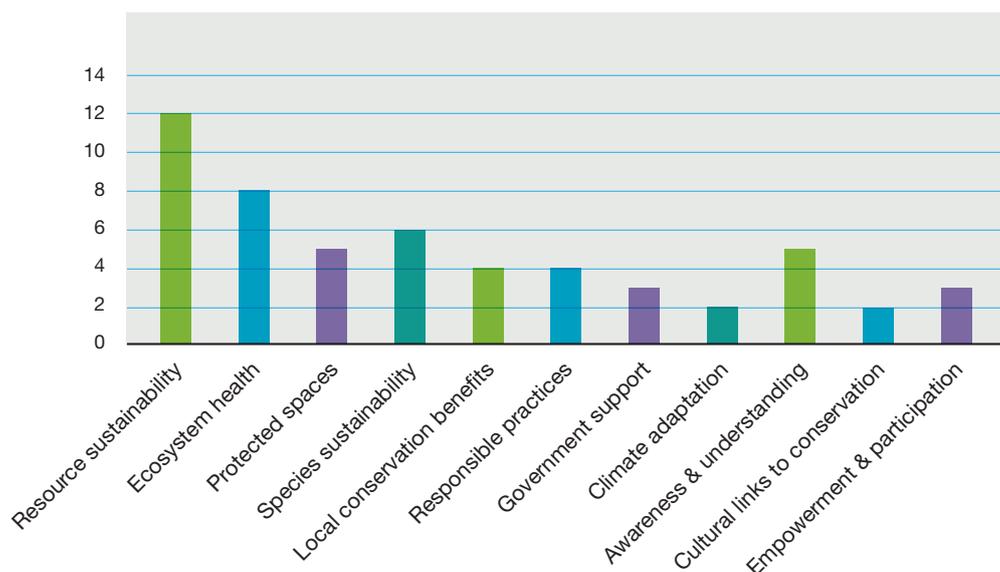
Source: Authors.

In a manner analogous to that for conservation concerns, analysis of the set of CCRN community locations was also used to identify the conservation outcomes arising out of the actions described in the respective 'community stories' (recognising that some actions may be ongoing making outcomes anticipated rather than realised). The 'practical outcomes' section of each Community Story was reviewed, to identify the primary conservation- or biodiversity-focused outcomes that were anticipated to result from the corresponding actions. A total of 54 outcomes were identified, across the locations. Although the focus was on concrete improvements in ecosystems, resource populations and the like, many case studies had, as their primary outcomes, results that could be seen as leading directly to conservation, but not necessarily relating to the state of the environment directly. Some examples are adoption of more responsible practices in resource use (such as less destructive fishing), provision of government support and improved awareness of the environment – all leading to better conservation results.

The outcomes were then grouped into sets of related outcomes, out of which 11 categories were identified (Figure 5): i) Resource Sustainability; ii) Ecosystem Health; iii) Protected Spaces; iv) Species Sustainability; v) Local Conservation

Benefits; vi) Responsible Practices; vii) Government Support; viii) Climate Adaptation; ix) Awareness and Understanding; x) Cultural Links to Conservation; and xi) Empowerment & Participation.

Categories i) to v) reflect actual conservation outcomes, while the categories vi) to xi) are direct 'paths' to conservation outcomes. A large majority, 65% (35 out of 54), of outcomes are actual conservation outcomes, while 35% (19 out of 54) are indirect (categories vi–xi). The direct conservation outcomes include three major groupings: a) those relating to natural resources (12); b) those relating to ecosystems and spaces (13); and those relating to specific species (6). The numbers seem to reflect a reasonably wide range of 'scales' for the outcomes.

5.3 Discussion

Direct versus indirect conservation. Within the set of community experiences assessed, there was a stronger orientation towards indirect rather than direct action to enhance biodiversity conservation. However, this focus is hardly surprising since the main focus of the CCRN in selecting the sites was to gain greater understanding of community approaches towards conservation. This contrasts with the common practice of biophysical scientists determining conservation strategies and activities,

which often failed through lack of awareness of the human component in decision making and inadequate provision of benefits to local peoples (Bennett & Dearden, 2013). Regardless, it is also clear that many community development initiatives must be better positioned in understanding local ecosystems and conservation needs at both local and broader scales.

Monitoring. In many cases of community conservation, there was a lack of attention paid to the monitoring of biodiversity outcomes as well as a lack of formal monitoring protocols. However, many government-managed protected areas (PA) also suffer from inadequate consideration and comprehensive monitoring plans. A recent survey of threats to global PA concluded that the increasing reliance on remote sensing for monitoring was not producing the quality of data required to assess the ecological outcomes of protection effectively (Schulze et al., 2018) and called for more locally gathered data to improve assessments.

Local people on the ground can provide such monitoring and understanding, especially when aided by the scientific community, in terms of protocols and measurements. This is another strong rationale to expand the role of community conserved areas, which, given adequate support, may be more effective for biodiversity conservation than government-managed areas.

Compliance. Illegal resource extraction (i.e. illegal fishing or wildlife exploitation within a protected area) is a key issue to be resolved in community conservation and conserved areas. Other relevant issues to be considered include: i) what should be the timeline of protected area moratorium in the face of uncertain levels of illegal activity? ii) what should be the role of communities in monitoring and in enforcing compliance within established PAs? (iii) what should be the guidelines to restore and/or conserve ecosystem biodiversity, functions and services? With these in mind, it is also important to note that communities practice self-policing when they have internalised the need to exclude any form of illegal and free-riding behaviour from the ecosystem they want to protect.

Local communities around the world, such as here in Tobago, benefit from biodiversity values and ecosystem services.
Photo: A. Charles

5.4 Conclusions

The overall context provided at the start of this chapter was based on recent initiatives to include OECMs in countries' official reporting to the CBD. Most of the concerns raised in this regard are about whether OECMs conserve biodiversity and if so, under what conditions. Although the cases examined here do not represent a category of OECMs (in fact some are not OECMs), it was found that to a large extent, the cases highlighted were successful in improving both community and ecosystem health over the timeframes examined.

The utility of these initiatives would be improved through greater attention to formal assessment of biodiversity outcomes. Such assessments often require input from trained scientists, who may be from government, universities or the NGO sector, working in partnership with communities. Collaborative approaches provide fertile grounds for such initiatives. While formal protected area systems, such as national parks, commonly involve collaborations with outside agencies, institutions and communities, these are mostly a secondary rather than a primary component. This contrasts with virtually all CCRN examples, where partnerships and collaboration are at the very heart of the initiative. Park agencies can learn much from a collaborative approach in moving forward the effective protection of biodiversity for future generations.

References

Armitage, D., Berkes, F. and Charles, A. (eds.) 2017. *Governing the Coastal Commons: Communities, Resilience and Transformation*. Oxford, UK and New York, USA: Earthscan, Routledge/Taylor & Francis. Available at: https://doi.org/10.4324/9781315688480

Bennett, N. and Dearden, P. (2013). 'Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand'. *Marine Policy* 44: 107–116. Available at: https://doi.org/10.1016/j.marpol.2013.08.017

Convention on Biological Diversity (CBD) (2010). *Decision X/2. The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets*. Conference of the Parties to the Convention of Biological Diversity. Tenth meeting, Nagoya, Japan, 18–29 October 2010. UNEP/CBD/COP/DEC/X/2. Available at: https://www.cbd.int/doc/decisions/cop-10/cop-10-dec-02-en.pdf (available in Arabic, Chinese, French, Russian and Spanish)

_____ (2018). 'Decision 14/8. Protected areas and other effective area-based conservation measures'. *Report of the Conference of the Parties to the Convention of Biological Diversity on its Fourteenth Meeting.* Sharm El-Sheikh, Egypt, 17–29 November 2018, p. 81. Available at: https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-08-en.pdf (available in Arabic, Chinese, French, Russian and Spanish at: Available at: https://www.cbd.int/meetings/COP-14)

Fox, J., Yonzon, P. and Podger, N. (1996). 'Mapping Conflicts Between Biodiversity and Human Needs in Langtang National Park, Nepal'.' *Conservation Biology* 10(2): 562–569. Available at: https://doi.org/10.1046/j.1523-1739.1996.10020562.x

Foxcroft, D., Hall, D. and Cowan, L. (2016). *Nuu-chah-nulth Territory, Canada: The Nuu-chah-nulth continue to fight for their aboriginal fishing rights even after these rights were recognized in Ahousaht et al vs Canada (2009)* [website article]. Available at: https://www.communityconservation.net/nuu-chah-nulth-territory-canada/

Jonas, H., MacKinnon, K., Dudley, N., Hockings, M., Jessen, S., Laffoley, D., MacKinnon, D., Matallana-Tobón, C.L., Sandwith, T., Waithaka, J. and Woodley, S. (2018. 'Editorial essay: other effective area-based conservation measures: from Aichi Target 11 to the Post-2020 Biodiversity Framework'. *Parks* 24 (Special Issue): 9–16. Available at: https://parksjournal.com/wp-content/uploads/2018/07/PARKS-24-SI-Low-ResWeb.pdf

Lemieux, C.J., Gray, P.A., Devillers, R., Wright, P.A., Dearden, P., Halpenny, E.A., Groulx, M., Beechey, T.J., Beazley, K. (2019) "How the race to achieve Aichi Target 11 could jeopardize the effective conservation of biodiversity in Canada and beyond'. *Marine Policy* 99: 312–323.

Schulze, K., Knights, K., Coad, L., Geldmann, J., Leverington, F., Eassom, A., Marr, M., Butchart, S.H., Hockings, M., Burgess, N.D. (2018). 'An assessment of threats to terrestrial protected areas'. *Conservation Letters* 11(3): e12345. Available at: https://doi.org/10.1111/conl.12435

Seijo, J.C., and Headley, M. 2020. *Punta Allen, Quintana Roo, Mexico: Community-based ecosystem conservation – The spiny lobster fishery*. Community Story.

Chapter 6

Livelihood outcomes of community conservation

Cristiana S. Seixas, Laura Loucks and Sharmalene Mendis-Millard*

6.1 Introduction

This chapter highlights key positive livelihood outcomes of community conservation and/or livelihood initiatives. Livelihood outcomes are seen as part of a process of community action related to conservation, economic, governance and/or social dimensions of communities. Communities correspond to a group of people who live and work within a specific ecosystem, and act collectively to improve local livelihoods while conserving the natural systems on which they (and potentially others) depend.

The focus is only on positive outcomes as they indicate how livelihoods improved in relation to these community initiatives. To this end, the accumulated information was reviewed from the CCRN community stories (May 2018) to identify key factors that contribute to positive livelihood outcomes. These were then selected and categorised according to four dimensions of livelihood outcomes:

1   conservation;
2   economic;
3   governance; and
4   social.

We applied this structure in a systematic survey of researchers working in 26 of the CCRN community sites, carried out in May 2018; this covered 20 sites

described on the CCRN website (as of May 2018), and an additional six sites.[7]

During the survey, researchers not only identified the livelihood outcomes they found in the corresponding study sites, but they also described three key aspects that led to community mobilisation for improving conservation and/or livelihoods (Seixas & Davy, 2007):

1   Trigger events;
2   windows of opportunity; and/or
3   interventions.

Livelihood outcomes often evolve as communities respond to certain kinds of social-ecological changes, which could include a trigger event or an intervention that catalyses people to take action (e.g. new conservation and/or development projects, or even a research project). Under certain conditions, a window of opportunity to change the status quo can emerge.

Results from the survey informed our conceptual model of how SES generate positive livelihood outcomes over some period of time (Figure 6). While the model is expressed in broad terms, it is useful for describing the complex relationships and feedback loops that affect the four dimensions of livelihood outcomes.

For example, the conceptual model illustrated in Figure 6 points to a few steps:

- Actors mobilise community-level resources, described as assets – natural, financial, physical, human and social capitals – (DFID, 1999) to either improve or diversify local livelihoods.
- As assets are mobilised and mediated by governance arrangements and, in some cases, catalytic elements, various livelihood outcome dimensions are improved.
- Catalytic elements refer to factors that facilitate both the initial planning and implementation of an initiative, as well as the ongoing maintenance of an initiative.
- Improved conservation, economic, governance and social dimensions of livelihood outcomes directly impact the state of community assets and governance arrangements.
- These steps lead to a virtuous circle in which positive livelihood outcomes are continually increased.

6.2 The communities

Our study includes a diversity of community types located in various parts of the world, with a wide range of population sizes and a variety of ecosystems. In some cases, community populations are less than 100 people (i.e. Noh Cah *ejido* neighbouring the Sian K'aan Biosphere Reserve, Mexico), whereas in other cases there are over 100,000 people. The ecosystem area inhabited and used by the population may be smaller than 100 ha (i.e. urban gardens) or as large as the West Coast of Vancouver Island (stretching over 300 km); it could also be a very isolated rural community (i.e. Praia do Sono, Brazil), or an urban community, such as Halifax in Nova Scotia, Canada. Regardless of these variations in population size and inhabited ecosystem area, some general patterns were identified in cases where communities have mobilised assets to improve livelihoods.

The communities involved, particularly those in rural and coastal areas, have traditionally focused on one or a combination of the following livelihood options: small-scale fishing, farming, eco-tourism and/or forestry. Medicinal plant harvesting and

Figure 6 Process of community (re) organisation that generates positive livelihood outcomes
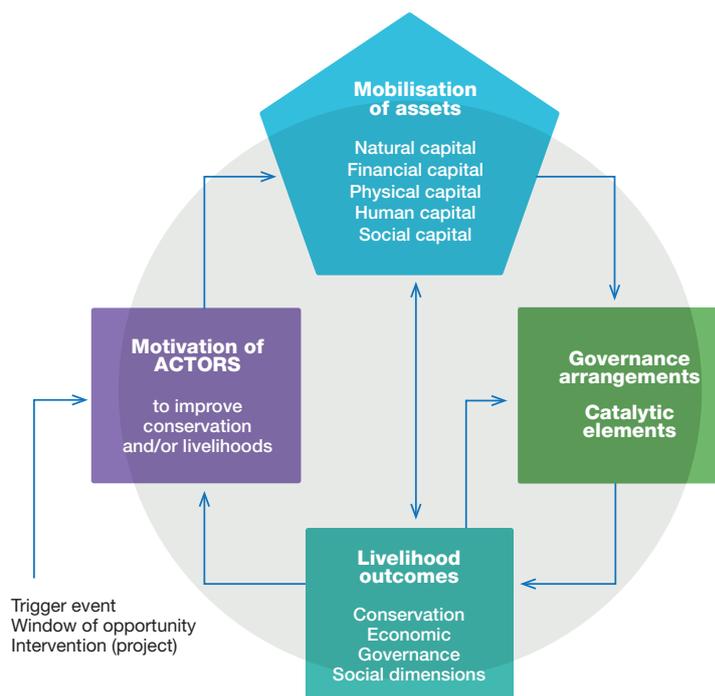
Source: Authors.

handcrafting also take place in some rural and coastal communities. Urban dwellers often rely on multiple livelihood activities.

6.2.1 Trigger events and responses to livelihood threats

A trigger event may be a shock to an SES that occurs over a short period of time (i.e. a disaster or new regulation) or a stress over a long period of time (i.e. environmental degradation or loss of rights) directly impacting a community that spurs people to react. When existing livelihoods were threatened or unsustainable, the study found that communities mobilised assets to change the status quo for different reasons in the following ways:

- Responding to a natural disaster (i.e. a flood in São Luis do Paraitinga, Brazil) or human-induced disaster (i.e. oil spills at Vila dos Pescadores, Brazil); or even to extreme weather events (i.e. extreme rainy season in Punta Allen, Mexico).
- Responding to displacement (i.e. Kosi Bay community, South Africa, displaced by the establishment of protected areas (PA)).

- Fighting for access rights to resources (e.g. after a protected area was imposed on the traditional area they depend on, as for communities neighbouring the Tsitsikamma National Park, South Africa; the *Caiçaras* from Trindade, neighbouring the Serra da Bocaina National Park, Brazil)
- Fighting for user rights (i.e. the court action taken by Nuu-chah-nulth people in western Canada for fishing rights)
- Dealing with resource scarcity (i.e. the Octopus in Bay Ranobe, Madagascar)
- Raising awareness of and countering environmental degradation (i.e. for forests on the Eastern Shore in Nova Scotia, Canada); restoring degraded areas (i.e. restoration of seagrass beds, in Tokyo Bay, Japan)
- Responding to government resource management proposals (i.e. Haida Gwaii Marine Planning, western Canada)
- Protesting against industrial development threatening livelihoods (e.g. fisher mobilisation against mining development in Olifants Estuary, South Africa; the Koh Sralao villagers protesting against sand dredging in their area, Cambodia); protesting against environmental problems in general (i.e. as the Chilika Lagoon fishers do in India)
- Revitalising traditional institutions (i.e. the *sasi laut* in Haruku village, Indonesia)
- Resisting resource use practices that violate Indigenous peoples' values and sacred lands (as for forest harvesting in the Clayoquot Sound UNESCO Biosphere Region, Canada).

6.2.2   Windows of opportunity

Windows of opportunity emerge often in broader socio-political and economic contexts that communities can take advantage of. They may or may not occur concomitantly to a trigger event or an intervention. In the context of the CCRN sites, windows of opportunities refer to the following:

- changes in legislation or policy providing new options (i.e. Canada's Ocean Act that fostered West Coast Aquatic, a co-management board, and the designation of the Clayoquot Biosphere Reserve)

Traditional houseboat fishers in the western part of Japan. Fishing families historically travel around the country for many days at a time, teaching fishing methods in return for local access to resources.
Photo: Mitsutaku Makino

- new legal instruments or policies providing new options (i.e. terms of agreement for fishing in a no-take protected area, in Tarituba, Brazil)
- funding opportunities (i.e. for establishing and implementing PA in Bali, Indonesia)
- emergence of new markets (i.e. development of tourism in Queshm Island, Iran).

Of the community cases examined, only three did not include a trigger event or window of opportunity that led to changes in livelihoods: i) Ysyk-Köl (Issyk Kul) Biosphere Reserve, in Kyrgyzstan; ii) the sacred forest of three communities in Limpopo District of Mozambique; and iii) the Noh Cah *ejido* from the Maya Zone in Quintana Roo, Mexico. All three were studies reporting on very long-term community conservation initiatives. Available information for the first two indicates how communities have conserved sacred sites and their importance for their identity; all three highlight the importance of combining top-down and local conservation efforts.

6.2.3   Interventions

Interventions, understood as the implementation of new conservation and/or development projects, or even a research project, took place in most of the cases and acted as catalytic elements for community action and associated asset mobilisation. Some examples of specific activities include:

- training workshops (which could be for various purposes, such as with tourism service providers

in Mahahual, Mexico, or to promote dialogue between staff and neighbouring communities of Saadani National Park, Tanzania);

- training in diverse issues and skills (e.g. to strengthen local fisheries organisations in Bolivia; to teach fishers how to produce value-added products in Odisha, India; to train children and their families on the value of conserving water in the face of climate change in Coquimbo region, Chile; and to train fishers in environmentally-friendly fishing techniques to replace cyanide, as in Les Village, Bali);
- participatory research (e.g. to document climate change and environmental perceptions by the Tujereng in West Africa's Gambia; to develop a participatory monitoring plan in Tarituba, Brazil);
- social marketing campaigns (i.e. "Cuidamos lo nuestro para los nuestros" (we take care of what is ours, for our people) to encourage local consumption of whole lobsters and adoption of responsible fishing practices in the Galapagos Islands, Ecuador); and
- funding for conservation and sustainable development (i.e. Canada's CA$ 12 million endowment fund for the Clayoquot Sound UNESCO Biosphere Region).

In a few cases, the interventions focused primarily on conservation or social goals, but in most cases, they were designed to tackle and improve both.

6.3 Factors contributing to positive livelihood outcomes

The analysis involved factors contributing to positive livelihood outcomes in the community sites (cases) surveyed, and assigned the categories of conservation, economic, governance or social improvements. The results are shown in Tables 2 and 3. The key findings of the analysis are:

- Governance and social factors were more prominent in most of the cases.
- Improved dialogue and information flows among parties and improved stewardship occurred in almost 70% of the cases.
- Strengthened relationships, community empowerment, leadership, social learning, and strengthened local cultural values, identity and

sense of place were reported in over 65% of the cases.

- Conservation factors most reported (ranging from 42% to 54% of the cases) were: new conservation actions; monitoring resource use; identification of ecologically significant areas to protect; new sustainable use practices; and development of management plans.
- In terms of economic factors, livelihood diversification occurred in 46% of the cases studied (e.g. including tourism – most common in rural and coastal areas – and gardening – most common in urban areas), while household income (the second most reported economic factor) was found to increase in only 31% of the cases.

These results reveal strong patterns regarding the iterative process of how communities reorganise in their response to either a trigger event and/or window of opportunity and/or intervention. Based on the patterns in the data gathered (Table 2), the analysis found that changes in governance and social relationships for livelihood improvement (i.e. positive outcomes) are required for changes in conservation and economic aspects of livelihoods. In other words, a trigger event and/or a window of opportunity and/or an intervention can move a community towards reorganisation; improved governance and social relationships are integral to this reorganisation process, in order to lead to positive conservation and economic outcomes.

For example, in a post-disaster situation, the community of São Luiz do Paraitinga in Brazil improved its governance process and strengthened social and cultural ties through numerous festivities, which then led to conservation actions (such as peoples' involvement in restoration projects) and new livelihood options (such as changing practices to cultivate agro-ecological products and setting up a street market to sell them, among others). In another instances, the community story of Eastern Shore, in Nova Scotia, Canada, illustrates "how the efforts of key local champions helped drive an evolution of community identity over time, allowing for increased collective action related to protection both of wilderness and local livelihoods" (Rainville et al., n.d.).

Table 2 Factors contributing to positive livelihood outcomes (n=26 cases surveyed)

	DIMENSIONS OF LIVELIHOOD OUTCOMES	No. of cases
CONSERVATION FACTORS	New conservation actions	14
	Monitoring resource use	12
	Identification of ecologically significant areas to protect	12
	New sustainable use practices	11
	Development of management plans	11
	Revision of management plans	10
	Habitat restoration	9
	Activism to stop degradation	6
	Habitat creation	5
ECONOMIC FACTORS	Livelihood diversification	12
	Increased household income	8
	Use of new/more sustainable technologies	7
	Diversification of products and market chain	6
	Improved profits – overcoming middlemen	5
	Increased income from Payment for Ecosystem Services	4
	Improved profits – Certification of origins/fair trade	3
	Increased access to financial capital	3
	Improved profits – Eco-certification	3
	Improved profits – Value-adding in processed foods & handicrafts	3
GOVERNANCE FACTORS	Improved dialogue among parties	20
	Improved communication/information flows within and between parties	18
	Improved stewardship	18
	Emergence of new partnerships around common interests	17
	Self-organising behaviour	16
	Conflict reduction/increased collaboration	13
	New management regulations	13
	Strengthen old partnerships	11
	Influence in government policies	11
	Emergence of new bridging organisations	11
	Revitalization of local institutions	11
	New rights achieved	6
SOCIAL FACTORS	Strengthen relationships	20
	Community empowerment	19
	Leadership/agency enhancement or development	17
	Social learning	17
	Strengthen local cultural values, identity & sense of place	17
	Knowledge co-production	16
	Emergence of learning opportunities & learning networks	14
	Increased capacity to negotiate	12
	New mechanism created to value Indigenous and local knowledge	11
	Women's empowerment	9
	Improved food security	8
	Improved education	7
	Improved human health	7
	Improved water security	6

Table 3 Percentage of cases with positive livelihood outcomes in the face of trigger events, windows of opportunity and/or interventions in the social-ecological system (n=26 cases surveyed)

LIVELIHOOD OUTCOMES	Percentage of cases
Governance factors	54%
Social factors	49%
Conservation factors	40%
Economic factors	22%

The data shows an average of 19 factors that contribute to positive outcomes per case (SD=9, Med=21). The two cases with the least number of positive factors (two factors each) were among the three cases for which no trigger event nor window of opportunity were reported for community mobilisation. This suggests that when community actors respond to a trigger event or take advantage of a window of opportunity, they mobilise assets to produce more positive livelihood outcomes than otherwise. However, more research is needed to validate this assertion.

6.4 Concluding remarks

Understanding livelihood outcomes as part of a process of community action can help explain the link between conservation and livelihoods.

As has been described throughout the chapter, communities often mobilise their assets in response to social-ecological change (trigger events, windows of opportunity or interventions), whether they occur externally or internally. This mobilisation response forces a reorganisation of how assets are governed and of social relationships, which leads to improvements identified as factors that contribute to livelihood outcomes (four dimensions). Governance and social factors, such as improved dialogue and information flows, and strengthened community empowerment were most prominent in our cases. Conservation factors (i.e. new sustainable use practices) and economic ones – primarily livelihood diversification and increased household income – were also reported as contributing to positive livelihood outcomes. These positive livelihood outcomes reinforce actions that help to mobilise community assets and strengthen governance arrangements, which in turn, mediate the flow of these assets to improve the four dimensions of livelihood outcomes (conservation, economic, governance and social) in a virtuous circle.

The case studies reviewed also suggest that community-driven conservation efforts can contribute to nature-based development providing positive livelihood outcomes (as evidenced from the eco-tourism case in Koh Pitak, Thailand, the fisheries case in Punta Allen, Mexico and the forestry case in Eastern Shore, Nova Scotia, Canada). On the other hand, when top-down conservation initiatives constrain livelihood options (as evidenced from the implementation of no-take PA in Brazil and Tanzania), the governance, social and economic dimension of livelihood outcomes may be severely affected.

References

Department for International Development (DFID) (1999). Sustainable livelihoods guidance sheets. Available at: https://www.ennonline.net/dfidsustainableliving

Rainville, T., Beaton, S, Graham, J. and Burns, M. (n.d.). Eastern Shore, Nova Scotia, Canada: Forest, Livelihood and Identity Conservation. CCRN Community Stories. Available at: https://www.communityconservation.net/wp-content/uploads/2017/05/Eastern-Shore-EAC_Forest_Community-Story-Final.pdf

Seixas, C.S. and Davy, B. (2007). 'Self-organization in integrated conservation and development initiatives'. *International Journal of the Commons* 2(1): 99–125. Available at: http://www.thecommonsjournal.org/index.php/ijc/article/view/24

Chapter 7

Governance and community conservation

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7.1 Introduction

This chapter outlines some lessons about how governance affects communities, their livelihoods and their relationship with conservation. Governance is defined as the institutions (rules) and social interactions (including various processes) that reflect societal preferences, and that influence who makes decisions about natural resources (e.g. fish, forests, wildlife), as well as the timing, political feasibility and acceptability of these institutions and processes. Governance is more than a matter of 'management' (i.e. operation and implementation of rules) – it involves values, relations of power and visions about alternative pathways forward.[8]

Across the CCRN, experiences in the diverse sites reflect the many challenges confronting local communities. Some of the challenges are social and economic, such as out-migration, lack of employment opportunities, or tourism pressure. Other challenges involve new policies and rules such as the imposition of regulations limiting access to the natural resources upon which communities depend. Increasingly, the challenges confronting communities emerge from (un)natural processes like climate change and its many effects (i.e. ocean acidification). In this context, innovative forms of governance are often needed to redefine how communities, governments and non-governmental organisations (NGOs) interact to solve historically embedded challenges (Armitage et al., 2017).

7.2 Why 'governance'?

As noted earlier, governance refers to the rules, institutions and processes through which societies make decisions about issues of importance. It could refer to, for example, protecting fish stocks, deciding about the suitability of aquaculture, fostering local development opportunities, or making a choice to set aside lands and waters for strict protection. The outcomes of governance processes can be hard to define, and the definitions depend on who is making decisions about the impacts on ecosystems and human well-being. Governance is thus about politics, and how power (formal and informal) is distributed (often unequally) among different actors in society and leveraged to facilitate or constrain action by communities.

There is ample evidence that communities can and should be a focal point for how environmental commons are governed – the lands, coasts and oceans upon which depend our well-being (Sowman & Wynberg, 2014; Bennett & Satterfield, 2018). Strong local governance is the foundation for success at other levels as well. Increasingly, examples from around the world demonstrate that communities and diverse sets of partners (government, NGOs and others) are collaborating to characterise, understand and respond to social and ecological dimensions of environmental change and its consequences. Yet, the distribution of power has not always been advantageous where communities are concerned, and for every example of a positive transformation in governance, there is a converse example of communities whose livelihoods and efforts to conserve their environments have been threatened by particular governance policies and practices (such as changes to historical access rights). How should we interpret such processes of governance? And what lessons can we leverage for those engaged in other community-based contexts?

8   For further information on governance, please see the CCRN guidebook on the subject (Berdej et al., 2016).

7.3 Lessons on governance

Communities address change in diverse ways and seek to deliberately transform untenable social, economic and ecological situations using multiple livelihood and conservation strategies. An initial survey across CCRN cases finds five broad themes or 'ingredients' of governance, and how communities deal or apply them in their specific context (Armitage et al., 2017):

1 Multi-level collaboration and participant engagement;
2 Access and management rights;
3 Knowledge co-production; and
4 Leadership and capacity building.

Table 4 outlines the key insights on governance with a few examples to provide additional context. These insights are not a blueprint for change – rather they offer entry points to understanding why governance is an important foundation for communities, conservation and livelihoods.

7.3.1 Multi-level collaboration and participatory engagement

Across all of the cases where some positive social and ecological outcomes are documented, a foundational governance ingredient is the set of institutional arrangements that fosters processes of multi-level collaboration and participatory engagement (i.e. in which local and Indigenous cultural practices are included), and that help to bring together multiple actors and perspectives. For instance, experiences in the Shiretoko World Heritage (Japan) site offer a valuable example of where various stakeholders, such as coastal fishers, the tourist and environmental sectors and academics, have cooperated to achieve the sustainable use of local ecosystem services. The experience also illustrates a process in which diverse actors across levels of decision making have taken into account the recommendations and advice from the UNESCO World Heritage Committee.

The Shiretoko case reflects a similar case in Brazil. In the Tamoios Protected Area, a no-take zone, small-scale fishers, managers and researchers

A coastal community on the west coast of France which is an example of local decision-making leading to improved conservation and livelihood solutions.
Photo: A. Charles

co-developed a monitoring protocol to provide information about fishing impacts in the marine environment and the relevance of fishing to sustain local livelihoods (Dias and Seixas, 2019). The protocol was part of a formal agreement between the protected area and small-scale fishers of the Tarituba community to temporarily allow small-scale fishing inside the Tamoios Protected Area. The agreement was a tool to mitigate conflicts created after the implementation of the no-take zone which made the practice of fishing illegal (Seixas et al., 2017). While the underlying bureaucratic rationale that led to this situation is problematic, the ultimate solution reflects the importance of intentionally-developed multi-level collaboration.

In Canada, experience on the West Coast of Vancouver Island, also highlight processes of multi-level collaboration and participatory engagement. For example, an institutional arrangement involving sub-regional roundtables has led to work on strategic plans that include fishery management, long-term salmon enhancement (production), habitat restoration and monitoring. The plans incorporate Indigenous, local and scientific knowledge. Participation at the roundtables is inclusive, capturing the concept of involving everyone who is impacted – including Indigenous groups, other levels of government, commercial and sport fishers, aquaculture, stewardship groups, tourism and others. As a result, the roundtables have the potential to be beneficial to the sustainability of wild salmon in the region.

7.3.2   Access and management rights

Most of the sites analysed by the CCRN are experiencing some form of 'change', or more specifically, are trying to adapt to new or more intense drivers of social and ecological uncertainty (e.g. climate change, new markets). In this context, a number of examples have emerged of policies and institutional arrangements that are intended to support communities – including potentially innovative changes in **access and management rights and/or customary approaches** – and sometimes in the context of co-management. While the potential for positive change is apparent, clarity about access and management rights is often problematic.

An example is the Tsitsikamma Marine Protected Area (MPA), in South Africa. Prior to a 2016 regulation change that allowed 20% of the no-take MPA to be re-zoned as open with control to registered community fishers (Muhl, 2019), selected communities were consulted, but their recommendations for re-zoning were not adopted. The feedback to the community has therefore not been satisfactory. This has resulted in a loss in legitimacy of the MPA in the communities' eyes, and as a result, many of the historical community fishers continue to fish at 'their spots' within the no-take zones, in what they deem is a sustainable manner. The Tsitsikamma example shows that where access and management rights are being re-negotiated, the legitimacy of the process may be as crucial as the focus on the rights themselves.

7.3.3   Social learning

Learning through change is recognised as a necessary feature of governance. Sometimes, learning processes support better responses and adaptation to change, while others are linked to efforts to a more fundamental transformation of social and ecological conditions. Regardless, opportunities for **social learning** provide a key ingredient of governance for community conservation – among different groups and in ways that help to challenge assumptions and social relations of power among actors (civil society, government, industry).

For example, in the context of the West Coast of Vancouver Island roundtables, one of the most valuable outcomes has been that groups with interests that outwardly appear divergent find common ground to work together in ways not previously anticipated. At one roundtable, when a conflict arose, an exercise was used to encourage all participants to put aside 'how' to proceed on the fishing plan, and instead recall 'why' they voluntarily came to the table. They unanimously agreed "it was all about the fish". While the group had varying ideas of how to express their values about fish, learning that they all held common values allowed them to continue working together in ways that were beneficial for the resource and their communities.

A similar process of learning is illustrated in the context of the Clayoquot Biosphere Trust (CBT), also on the west coast of Vancouver Island. Here, the CBT Board consists of 10 voting members from five First Nation and three non-Indigenous communities, as well as two co-chairs, one representing a Nuu-chah-nulth community and another representing a non-Indigenous community. Four non-voting advisors represent provincial and federal government agencies. Board members are required to live in the community they represent and oversee the financial management and strategic development of a CA$ 12 million endowment fund created by the government of Canada as a stable asset for the Clayoquot Sound Biosphere Reserve region.

Initially, CBT Board members advocated for grant making in their own individual communities rather than for all people and organisations in the region. The lack of a regional focus often resulted in heated discussions and sometimes outright conflict. However, the CBT overcame these obstacles with the creation of community volunteer grant-making advisory committees to make recommendations to the Board for the disbursement of the organisation's funds. Over time, the committees have developed grant-making criteria that support region-wide social values and project funding priorities.

7.3.4   Knowledge co-production

Linked to learning processes is an acknowledgement that governance processes must recognise

and incorporate multiple sources and types of knowledge. This emphasis on knowledge pluralism and/or **knowledge co-production** is ultimately needed to build a holistic, integrated understanding of complex systems reflected in communities and conservation situations.

For example, the managers and community fishers in the Tamoios and Tsitsikamma MPAs previously cited had different views on the importance of the area. For the managers, the marine environment is ecologically relevant for conservation, while the fishers view the environment as part of their identity where they were born and raised. In the South African Tsitsikamma case, knowledge co-production has not occurred because rules have largely been created and implemented in a top-down fashion from the regulating authority. The result of a lack of knowledge-sharing is an MPA that is viewed as illegitimate. In the case of the Brazilian Tamoios MPA, however, the participatory approach to design the monitoring protocol enabled the integration of different knowledge types and perspectives and formed the basis for more shared understanding (Dias and Seixas, 2019). As experiences in the CCRN show, knowledge co-production is very much an important catalyst for better outcomes.

On the west coast of Vancouver Island, the 2018 Clayoquot Biosphere Trust Vital Signs report (CBT, 2018) highlights data collected from over 20 different local organisations and synthesises this data according to 14 of the 17 SDGs. The results were used to initiate conversations throughout the region to discuss complex issues such as the relationship between tourism growth and the widening gap between household income and the rising costs of living. Moreover, these discussions provided an opportunity to explore conservation issues that are often invisible to local residents, such as the link between the increasing size of area closures due to shellfish contamination and the water-use restrictions implemented during the peak tourism season.

7.3.5 Leadership and capacity building

A final ingredient evident across many cases and experiences studied is the importance of governance **leadership and capacity building** to overcome conflicts, build trust, generate knowledge, as well as foster entrepreneurial activities (i.e. income and livelihood diversification).

For example, while the overall situation is complicated in Tsitsikamma (as noted above), the rezoning of the no-take protected area came from pressure exerted by an organised group of local community fishers. The leadership group protested the lack of access to the coastline as a violation of their historic right to use the marine resources for their livelihoods, food security and well-being. By exerting pressure on the local municipality and threatening to use their vote for an opposing party in the upcoming election, the people were able have 20% of the no-take MPA rezoned to accommodate the needs of local community fishers (the regulations were then further improved and addressed via an activist film that highlighted ongoing issues made in partnership with the communities).[9]

Similarly, during the design of the monitoring protocol for the Tamoios MPA in Brazil, the leadership of the local community of Tarituba was a key ingredient in mobilising people to participate in the process. Participants were, in general, waiting for an informal

The world over, people gather in their communities to address local environmental and livelihood challenges.
Photo: A. Charles

9   https://www.communityconservation.net/born-on-the-rocks/

'approval' of the local leader, which means they would only participate if the leader invited them. Such examples highlight the importance of the role of 'informal' leadership in catalysing action at the local level.

However, it is equally important to recognise the many forces that can be aligned against local leadership and capacity building efforts. Indeed, the Tsitsikamma experience reflected a strong counter-narrative and 'push-back' on community efforts. Here, many in the marine conservation community publicly criticised efforts to open access to community members and have taken the regulating authority (formerly the South African Department of Environmental Affairs) to court over their 2015 decision to rezone (which they won)

and threatened to take them to court again in 2016 and 2017. The controversy over the issue endures and in spite of the rezoned areas being open for legal and recognised fishing, community fishers continue to go to their place of preference and risk fines, often placing themselves in dangerous situations to avoid rangers. The leadership vacuum that exists – the regulating authority (SANParks) is no longer seen as a legitimate actor in this issue – means that continued uncertainty and conflict is likely (Muhl, 2019).

7.4 Conclusions

What do the examples reveal for the role of governance in the ways in which communities connect conservation and livelihoods? Are the interests of local resource users in conservation

Table 4 Summary of governance attributes addressed in selected CCRN cases

COUNTRY	CCRN CASE STUDY SITES	MULTI-LEVEL COLLABORATION AND PARTICIPANT ENGAGEMENT	ACCESS AND MANAGEMENT RIGHTS	SOCIAL LEARNING	KNOWLEDGE CO-PRODUCTION	LEADERSHIP AND CAPACITY BUILDING
Bolivia	Northern Amazon	**	**			*
Brazil	Paraty Bay	*	*		*	
Brazil	Vila dos Pescadores, state of Sao Paulo	*	**			
Canada	Clayoquot Sound	**	**	**	*	**
Canada	Nuu-Chah-Nulth	*	**		**	**
Canada	Eastern Shore, NS	**		*		**
Chile	Coquimbo Region	*	**			
India	Odisha	**	*		**	**
India	Chilika lagoon	**	*			*
Indonesia	Bali	**	*	*	**	**
Indonesia	Haruku Village	**	**	*	**	**
Iran	Qeshm Island	*	*			*
Jamaica	Bluefields	**	**		*	*
Japan	Tokyo Bay	**	**	*		**
Kyrgyzstan	Ysyk-Köl (Issyk Kul) Biosphere Reserve	*	*	*	**	**
Mexico	Mayan Zone (Xmaben and Noh-Cah)	*	*		*	**
Mexico	Punta Allen	**	**	**	*	*
South Africa	Olifants Estuary	*	*	*		*
South Africa	Tsitsikamma	*	**			*
Tanzania	Saadani National Park		*			*
Thailand	Koh Pitak	**	**	*		**

** = Strong presence | * = Limited presence | Blank = No clear presence

practice matched by meaningful involvement in decision processes at multiple levels? Are governance processes emerging in contested conservation situations that support a pathway forward for more just and equitable outcomes, or for situations of increased uncertainty because of changing environmental conditions? Indeed, there are many challenges to move towards the governance principles and practices (or lessons) outlined here. In many contexts, ways of governing are deeply entrenched, which calls for greater social learning or knowledge co-production to engage with historical top-down decision making and power inequities among different groups. In most settings, governance outcomes will be contested and reflect trade-offs across multiple objectives. Limits on capacity and leadership are also significant in many contexts. Yet, as reflected across the many cases within the CCRN (Table 4), communities are working in partnership with enabling governments in ways that achieve important outcomes for their livelihoods and conservation efforts. The ingredients for effective governance are clearly emerging.

References

Armitage, D., Charles, A., Berkes, F. (eds.) (2017). *Governing the Coastal Commons: Communities, Resilience and Transformation*. Oxford, UK and New York, USA: Earthscan, Routledge/Taylor & Francis. Available at: https://doi.org/10.4324/9781315688480

Bennett, N. and Satterfield, T. (2018). 'Environmental governance: A practical framework to guide design, evaluation, and analysis'. *Conservation Letters* 11(6): e12600. Available at: https://doi.org/10.1111/conl.12600

Berdej, S., Armitage, D., Charles, A. (2016). *Governance and Community Conservation.*, Halifax, Canada: Community Conservation Research Network, Saint Mary's University. Available at: https://www.communityconservation.net/wp-content/uploads/2016/01/Governance-and-Community-Conservation-Guidebook-1.pdf

Clayoquot Biosphere Trust (CBT) (2018). *Clayoquot Sound Biosphere Region's Vital Signs 2018*. Tofino, BC, Canada: Clayoquot Biosphere Trust. Available at: https://clayoquotbiosphere.org/files/file/5f34519fe3bab/Vital_Signs_18_web_final.pdf

Dias, A.C.E. and C.S. Seixas. (2019). 'Participatory design of a monitoring protocol for the small-scale fisheries at the community of Tarituba, Paraty, RJ, Brazil'. *Ambiente & Sociedade* 22: e00702. Available at: https://www.scielo.br/pdf/asoc/v22/1809-4422-asoc-22-e00702.pdf (English) and https://www.scielo.br/pdf/asoc/v22/pt_1809-4422-asoc-22-e00702.pdf (Portuguese)

Muhl, E.-K. (2019). *An analysis of the perceptions surrounding the re-zoning of the Tsitsikamma Marine Protected Area*. Master's thesis (Environmental and Geographical Science). Department of Environmental and Geographical Science, Faculty of Science, University of Cape Town, South Africa. Available at: http://hdl.handle.net/11427/31347

Seixas C.S., A.C.E. Dias and De Freitas, R.R. (2017). 'Navigating from government-centralised management to adaptive co-management in a marine protected area, Paraty, Brazil. Turbulence, winds of opportunity and progress towards transformation'. In: D. Armitage, A. Charles, F. Berkes (eds.), *Governing the Coastal Commons: Communities, Resilience and Transformation*, Chapter 9, pp. 157–180. Available at: https://doi.org/10.4324/9781315688480-9

Sowman, M. and Wynberg, R. (eds.) (2014). *Governance for Justice and Environmental Sustainability: Lessons across Natural Resource Sectors in Sub-Saharan Africa*. London: Routledge/Earthscan. Available at: https://doi.org/10.4324/9780203120880

Chapter 8

Power in realising community conservation and livelihoods

Prateep Kumar Nayak*

8.1 Introduction

Power is at the heart of community conservation, and in turn influences its ultimate success and failure. Despite this, and the central role of power in understanding environmental conservation generally (Scott, 2001; Raik et al., 2008), attention to the actual workings of power in community conservation settings has been limited. This is particularly true with regard to the conditions determining the success and failure of community conservation, i.e. there has been a lack of attention to how power affects economic, social, historical, cultural and political conditions (Njaya et al., 2012; Nayak et al., 2016). There is, in reality, little discussion on what power means and how it manifests (Sinclair & Ommer, 2006; Jentoft et al., 2007).

There is no simple definition or specific approach through which to understand power (Raik et al., 2008) due to which Berdej et al. (2019) define it as the capacity to cause effect. Power can be defined in multiple ways (Winter, 1996; Lukes, 2005; Raik et al., 2008):

1 Power rests with the individual or a group who exercises it over another. Human agency plays a central role in how power manifests either as coercion or constraint (i.e. agent-centred view);

2 Power reflects through the social–political conditions in which individuals operate and structural processes that shape human relations and interests, which places power outside the

individual and associating it with existing structural forces. Individuals or groups exercise power over others because of their position in society (i.e. structural power);

3 Power often goes beyond the agency/structure dualism as both the social structure and the agent interact and depend upon one another in identifying enduring structural preconditions that shape contingent human interaction (realist power).

This chapter is about the relevance of power in realising the goals of environmental conservation and sustainable livelihoods at the community scale. The chapter explores how influences of negative power dynamics tend to derail community conservation initiatives and livelihood outcomes, while inversely, positive or constructive power can help create stronger foundations for community conservation and help promote sustainable outcomes. This is done by drawing on community cases of the CCRN. In particular, the sites listed in Table 5 form the basis of the analysis in this chapter (and are referred to by the corresponding numbering throughout).

8.2 Linking power to community conservation

Power is a dominant force shaping conservation and livelihood processes in a variety of community contexts. Even though its extent of influence varies, power seems unavoidable – both inherent and integral to the goals of conservation and livelihoods,

Table 5 List of CCRN sites considered in this chapter (based on the numbering as indicated)

	COUNTRY	CCRN SITES
1	Bolivia	Northern Amazon
2	Brazil	Paraty Bay
3	Brazil	São Luiz do Paraitinga and Catuçaba
4	Brazil	Vila dos Pescadores, state of São Paulo
5	Cambodia	Koh Sralao
6	Canada	Clayoquot Sound Biosphere Reserve
7	Canada	West Coast Vancouver Island
8	Canada	Eastern Shore, Nova Scotia
9	Canada	Halifax, British Columbia
10	Canada	Nuu-Chah-Nulth Nation
11	Chile	Coquimbo Region
12	Ecuador	Galapagos Islands
13	India	Chilika Lagoon
14	India	Odisha
15	Indonesia	Bali
16	Indonesia	Haruku Village
17	Indonesia	Les Village, Bali
18	Iran	Qeshm Island Geopark
19	Japan	Abashiri, Shiretoko, Tokyo Bay, Hiroshima and Ishigaki
20	Kyrgyzstan	Ysyk-Köl (Issyk Kul) Biosphere Reserve
21	Mexico	Mayan Zone (Xmaben and Noh-Cah)
22	Mexico	Punta Allen, Quintana Roo
23	South Africa	Olifants Estuary
24	South Africa	Tsitsikamma Marine Protected Area
25	Tanzania	Saadani National Park
26	Thailand	Koh Pitak
27	The Gambia	Tujereng

and inseparable from conservation and livelihood processes at the local scale. Power influences community conservation and livelihood processes literally around the world – and across north and south, rich and poor, Indigenous and non-Indigenous, democratic and non-democratic, rural and urban, etc. This directs us to the need for global attention to power in order to make conservation and livelihood outcomes successful.

Power in relation to conservation and livelihoods is a dynamic process that must be considered not only in the present but, equally importantly, in the past as well as in the future. The various CCRN stories cover the past, present and future of community conservation and livelihood initiatives. Four inter-related questions help generate a number of insights on linking power to community conservation and livelihoods:

8.2.1 What are the main power issues in the community conservation and livelihood context?

Power issues are inherent in the way local and Indigenous communities are threatened by economic development activities, e.g. overfishing, aquaculture, logging, mining and tourism development. These activities may be prioritised by decision makers over and above the needs of the local community (food security, subsistence, livelihoods, cultural and religious practice, etc.) and the environment (conservation or sustainable use). Actors with economic power and close ties with the government are often in a more advantageous position when it comes to resource use and economic activities. In some cases, resource management is affected by decisions and actions of external actors (i.e. from outside the local community). For instance, the building of hydroelectric dams upstream in another state or jurisdiction affects biodiversity and fish stock downstream. Such power issues were seen to dominate the conservation and livelihood context in several CCRN cases [numbers 1, 4, 6, 8, 13, 12, 15 and 23 in Table 5].

Further, territorial rights and access privileges of Indigenous and other local communities are often disregarded by more powerful actors (e.g.

government, commercial fishers, lumber mills, mines, aquaculture lobby), leading to power imbalances. The informal and customary institutional regulations enforced by local communities with regard to resource conservation, protecting food security and livelihoods are often overturned in this process. Territories of Indigenous communities are subsequently encroached or invaded, including the natural resources that could be sourced from therein [1, 8, 13].

Policy making and enforcement on resource management is often not coordinated among local, regional and national levels of government. For example, although there may be national laws or policies on conservation, local enforcement is weak and flawed [13, 15]. Resource management in protected areas (PA) usually follows a top-down approach. This has been a source of conflict since PA managers make decisions without a prior understanding of its impact on the local communities. More often than not, lack of transparency from the PA managers, lack of information provided to the local community on the benefits of conservation rules and regulations, and lack of communication between PA managers and local communities further intensify the conflicts [1, 2, 20, 24, 25].

8.2.2 What are the conservation and livelihood challenges linked to power?

Illegal entry by outsiders for unregulated activities is a key challenge to community conservation and livelihoods initiatives. Such interventions have resulted in numerous conflicts across cases. For example, since the 1990s, there has been a rapid increase in commercial logging and fishing in the Bolivian Amazon, where urban-based fishers lacking fishing rights invade *Tierras Comunitarias de Origen* (TCOs), or communal rights areas. In Chilika Lagoon (India), encroachment and de facto privatisation has occurred in customary areas that are key to both conservation and livelihoods. In Paraty Bay (Brazil), serious conflicts have surfaced between fishers and PA managers due to a top-down approach, conflicting agendas (tourism is a priority, fisheries is not), unidirectional communication, lack of transparency and absence of a mechanism for

In cities around the world, such as here in Chile, power differences can be seen clearly in the nature of housing and local livelihoods.
Photo: A. Charles

negotiation. Other cases suggest that the potential for conflict is high due to competing interests and intensive utilisation of resource areas [1, 2, 6, 7, 15, 16, 19, 24, 25].

Among the other challenges to conservation and livelihoods are: (i) depletion of resources (i.e. fish) through overexploitation [5, 12]; (ii) loss of access rights and a host of restrictive government measures keeping people away from the site of conservation [6, 12]; and (iii) growing food insecurity and poverty [9, 11]. These processes have provoked extensive human mobility. Rural out-migration is common across the cases, hampering the availability of rural workers and lowering social cohesion [3, 5, 8, 13].

Many communities suffer from multiple vulnerabilities resulting from environmental and economic development processes, e.g. industrial development including ports and tourism hubs and or environmental change through floods, cyclones, droughts, pollution and other natural disasters, impacting human well-being [4, 11].

8.2.3 What community initiatives are effective in addressing issues of power related to conservation and livelihoods?

Social capital and leadership by community members are key factors in fighting for the rights of the community and ensuring resource conservation [4, 5, 11, 13, 14, 17, 18, 22, 26]. In Qeshm Island (Iran) and Ysyk-Köl (Issyk Kul) Biosphere Reserve

(Kyrgyzstan), spiritual and social values motivated the local people to participate in conservation and as a source of power. Strategic collaborations of communities with researchers, NGOs, academia and government happened in multiple contexts [1, 7, 8, 9, 11, 22, 23]. Institutions are seen as the lifeline of community initiatives in most cases, where strengthening the institutional and organisational foundation took priority [1, 2, 9, 11, 22, 23]. In some cases, a combination of community-based co-management and territorial user rights approaches in conservation and management has been successful [22, 23].

With reference to institutional responses, Brazil's Paraty Bay is an example. There, efforts are underway to ensure community rights to access resources within PA and the local institutions are leading joint discussions between fishers and PA managers. In Sao Luis and Catucaba, a network of local leaders, local and state governments, local and regional NGOs, and researchers was formed to create synergies among diverse conservation and livelihoods efforts.

In India, Odisha's Samudram Women's Federation (SWF), established in response to conservation and livelihood challenges, is both a state-level federation of women fishers and a social enterprise, providing social, financial and infrastructural support to local women fishers to engage in conservation-led livelihood activities. This highlights the important role of women in aiding community conservation initiatives and the need for tilting the power balance in favour of the marginalised gender [4, 5, 11, 14]. Power emanates from alternatives and options being made available to the communities. To this end, diversification of livelihoods and engaging in multiple conservation arrangements have helped communities to prevent further degradation of the natural environment and loss of income [3, 5, 8, 13].

In many instances, local communities fight for their rights through social struggle, protests and legal action. In some cases, local fishers engage with a national network of small-scale fisheries to strengthen their voice and ability to negotiate demands. In other cases, where courts decide in favour of local and Indigenous communities, the decision may not be carried out by the government and thus may not translate into positive outcomes [5, 6, 8, 10, 13, 24].

The CCRN survey found that multiple forms of community activism were used by communities to address power issues. In Koh Sralao, villagers engaged in protests, public consultations and meetings with sand dredgers, with the support of NGOs. In Chilika Lagoon (India), fishers resorted to social and political movements to protest acts of external forces, resulting in successful court cases leading to a ban on aquaculture. In Tsitsikamma (South Africa), the community created an organisation to represent local farmers who wanted to access the coast, and actively protested the regulating authority such that the community became increasingly mobilised.

8.2.4 How are the practical outcomes related to power?

A common outcome, across the community stories, pertains to the initiatives of local communities to politically organise themselves to address powerlessness. External shocks, such as major disasters, can trigger communities to self-organise and undertake sustainable development or conservation initiatives [3]. Power gained through self-organisation has strengthened cultural identity, helped to preserve local traditions, promoted local development and improved communities' capacity to act collectively [3, 11].

In several instances, local management authorities, cooperatives and NGOs worked together based on principles of cooperation, collaboration and participation [7, 8, 9, 14, 15, 24, 25]. Others include more formal arrangements between local communities and governments through co-management that implies power sharing [1, 3, 4, 6, 22, 23, 27]. These various ways of working together have yielded better resource management, i.e. fishery recovery [12], and enhanced the capacity and agency to engage with powerful actors and challenge decisions [23]. Participatory methods and engagement of stakeholders is not easy, but once harnessed could significantly contribute to the success of conservation initiatives [3, 6, 8, 12]. Decentralising management systems at differing

scales may provide an alternative to a monocentric approach, as an outcome of positive power dynamics [13].

Scientific/technical knowledge often takes precedence when it comes to decision-making on resource management. Knowledge is power, but in some cases, local communities do not have decision-making power as their knowledge system is not readily recognised. Indigenous knowledge and various forms of community-based traditional ecological knowledge (TEK), while remaining largely untapped, can be used for conservation efforts. Several cases show that conservation initiatives that balance both scientific and traditional knowledge have a high probability of success if power issues are addressed [3, 6, 7, 13, 16, 21, 23, 27].

Initiatives to highlight the role of power have generated practical outcomes that include:

1 a greater appreciation of the rights and entitlements of different users and stakeholders [23];

2 emergence of strong leadership at the community level that spearheads conservation initiatives and negotiations (e.g. transparent and strong individual leadership [22] and NGO leadership motivating a shift away from cyanide fishing [17]);

3 strengthened social capital and unity among community members due to their inter-relatedness and common history [17];

4 emergence of gender awareness, encouraging participation of women [16] (e.g. the importance of women in water management and decision-making in Coquimbo Region, and the role of women in mangrove conservation and sustainable livelihoods in Villa dos Pescadores and in Koh Sralao); and

5 power-related outcomes have facilitated better communication, exposure, education and awareness about conservation and its contributions to livelihoods, such as a record overall increase in awareness and efforts to protect coastal areas.

Community-level institutions are at the core of how conservation and livelihood outcomes are obtained. Institutions helped strengthen roles and the capacity of communities in conservation planning, implementation, monitoring and enforcement. Oftentimes, there is a need for a 'bridging' organisation that could facilitate interaction and communication between the actors and stakeholders – whether an NGO, a government agency, a university or a collaborative network [13, 15, 17]. In Bali Indonesia, this successfully connected diverse actors or groups through collaboration, communication, and resource sharing.

8.3 The power of power: Can it help conservation and livelihoods?

What is power in the context of community conservation and livelihoods? Is power an inner strength of the community or is it externally ordained? The CCRN stories show how individuals and communities are capable of defining their own power and devising empowerment strategies. Community voices also give an indication that power may be, and often is, linked to external, antecedent factors. Politics goes hand in hand with power in this entire process – **where there are issues of power, there is politics.**

Power can be visible, invisible or purposely hidden within the community conservation and livelihood context:

- Firstly, in visible power situations, communities can hold power explicitly to influence and shape conservation and livelihood processes and outcomes. As such, they remain in the driver's seat leading the process to obtain desired outcomes, and may have varying levels of support from external actors.
- Secondly, hidden power situations are somewhat opposite to the visible power situations. Here, community conservation actors hold power implicitly, with their ultimate agendas concealed, to achieve objectives. The associated politics leads to exclusion of those without adequate power.
- Thirdly, some cases show the role of invisible power in the context of community conservation

Table 6 Key measures to examine power in community conservation

KEY AREAS	MEASURES TO EXPLORE
Develop perspectives on context	– Geography, history, society-culture, environment-resource, political- administrative, economic-livelihoods
Understand the 'bone of contention'	– Power to do what? What does power signify? – Issues, problems, objects, motivations, aspirations
Dissect the nature of power	– Who is allied with whom? Who is gaining in the power dynamics? Who is losing? – What is at stake (livelihoods, rights, ecosystem health, cultural identity)?
Recognise the drivers	– Proximate causes (human activities or immediate actions) – Underlying forces (fundamental systemic processes)
Identify main actors/ stakeholders	– Who are the actors/stakeholders, and their roles? – What are the competing interests?
Comprehend purpose of claiming or grabbing power	– How is power used by different actors, and to what ends? – What outcomes can actors obtain by possessing power?
Know the strategies adopted	– What strategies and counter-strategies are being used (e.g. networks, activism, protest, negotiations, court cases)?
Evaluate the impacts	– What is the range of impacts? – How is the community, their conservation initiatives and livelihoods impacted?
Examine the responses	– What is being done? What was done in the past? – What has been the government's role? – How strong is the voice of NGOs and civil society?
Clarify the key trends	– Where is the situation heading? – What are the future consequences? – What is the future if things remain unresolved?

and livelihoods. In this situation, power is socially and culturally embedded, and centres around norms, values, beliefs, knowledge, ideology, worldviews and perceptions that condition or influence individuals' or groups' exercise of power. In this sense, power seems to be deeply rooted in the place where conservation and livelihoods are debated and realised.

Concurrently, there are several nuances about power in a community that must be considered. First and foremost, not everyone has power, i.e. power rests with some individuals or entities while others do not have it at all. Therefore, those who have power can compel others to follow suit. Secondly, those who have power do not sit idle. Rather, they are often inclined to exercise their power over others (typically those who have less or no power) to restrict their freedom and actions. These processes of power

easily produce negative politics, which can have pernicious effects on conservation and livelihood outcomes. The CCRN cases offer insights on how to respond to such adverse situations.

In all these power situations, conservation and livelihood goals become vulnerable: will outcomes reflect what is best for the community? What needs to be done to deal with the realities associated with visible, invisible and hidden power? A review of community examples reveals a list of ingredients that can positively promote conservation and livelihood goals and outcomes at the community level. These may be categorised as follows:

- **Normative ingredients:** norms, rules, customs, practices, traditions, enabling policies and laws, awareness and education, social interactions and relationships;

- **Structural ingredients:** strong institutions and organisations at local but also multiple levels, political space for involvement in decision making, distribution systems for benefit sharing, market linkages; and
- **Functional/action ingredients:** social movements, protests and struggles, court cases, training and exposure, dialogues, policy and programme implementation.

8.4 Conclusions

Is the manifestation of power always negative? Or can power positively contribute to the realisation of community conservation and livelihood goals and promote sustainable outcomes? If so, how? Table 6 lists key areas to better understand power within the context community conservation and to enable communities to successfully respond to the multiple challenges posed.

The CCRN's community stories help us to build a social-ecological image of power. They clarify where power rests in both the social and ecological domains, and takes shape through the influence of their highly dynamic interactions. Power reflects a social-ecological reality in either promoting or hindering community conservation and livelihood goals and outcomes.

References

Berdej, S., Silver, J. and Armitage, D. (2019). 'A Political Ecology Perspective on Bridging Organizations and Their Influence on Marine Conservation'. *Society & Natural Resources* 32(11): 1258–1275. Available at: https://doi.org/10.1080/08941920.2019.1626960

Jentoft, S. (2007). In: The Power of Power: The Understated Aspect of Fisheries and Coastal Management. *Human Organization* 66(4): 426–436. Available at: https://doi.org/10.17730/humo.66.4.a836621h2k5x46m2

Lukes, S. (2005). *Power: A Radical View*. Second edition. London, UK: Palgrave Macmillan.

Nayak, P.K., Armitage, D. and Andrachuk, M. (2016). 'Power and politics of social-ecological regime shifts in the Chilika lagoon, India and Tam Giang lagoon, Vietnam'. *Regional Environmental Change* 16(2): 325–339. Available at: https://doi.org/10.1007/s10113-015-0775-4

Njaya, F., Donda, P. and Bene, C. (2012). 'Analysis of Power in Fisheries Co-Management: Experiences from Malawi'. *Society & Natural Resources* 25(7): 652–666. Available at: https://doi:10.1080/08941920.2011.627912

Raik, D.B., Wilson, A.L. and Decker, D.J. (2008). 'Power in Natural Resources Management: An Application of Theory'. *Society & Natural Resources* 21(8): 729–739. Available at: https://doi:10.1080/08941920801905195

Scott, J. (2001). *Power*. Cambridge, UK: Polity Press.

Sinclair, P.R. and Ommer, R.E. (eds.). (2006). *Power and Restructuring: Canada's Coastal Society and Environment*. New York, USA: ISER Books, St. John's University Institute for Social and Economic Research.

Winter, S.L. (1996). The "power" thing. *Virginia Law Review* 82(5): 721–835.

Chapter 9

Indigenous perspectives on community conservation

Richard Nuna, Trudy Sable, Dawn Foxcroft and Marta da Graça Z. Simbine*

9.1 Introduction

This chapter presents three perspectives on Indigenous community conservation: i) reflecting the voice of the Innu Nation of Labrador, on the eastern side of Canada; a perspective from the Nuu-chah-nulth, on the western coast of Canada; and iii) a focus on communities of Machangana in the Limpopo District of southern Mozambique. The first describes the Innu perspective on using and protecting the environment (conservation), and the roles of Indigenous knowledge and respect for Innu decision-making. The second is a personal account of Nuu-chah-nulth life on the west coast of Vancouver Island (Canada) leading into a discussion of the Nuu-chah-nulth worldview and the principles that guide their use of the world around them. The third essay focuses on language, in particular how the concept of 'conservation' arises in the *Xichangana* language (prominent in the Limpopo District) despite there being no actual translation of that word.

9.2 Conservation and the respected environment of the Innu

Contributed by Richard Nuna, with Trudy Sable

The Innu have always been supportive of conservation in all aspects of living. The Innu are part of the land; we are part of the animals we survive on. **We do not manage wildlife or the environment; we simply manage our behaviour towards these** biological and ecological factors. As Sebastien Piwas said in our film, *Nakatuenita: Respect:*[10] "If you do not respect the animal spirits, you will not be able to get any food. The word respect is very powerful among the Innu. If you don't respect anything, how… do you think you are going to get respect from the animals? How can the animals respect you if you don't respect the animals?" Respect, because we only take what we need and leave something behind for another time, or other Innu, or other humans. Everything has to do with this. What do you call it? The circle of life; everything is connected. The word 'conservation' could be translated in that sense, 'conversationally' – we leave things alone so others can use them.
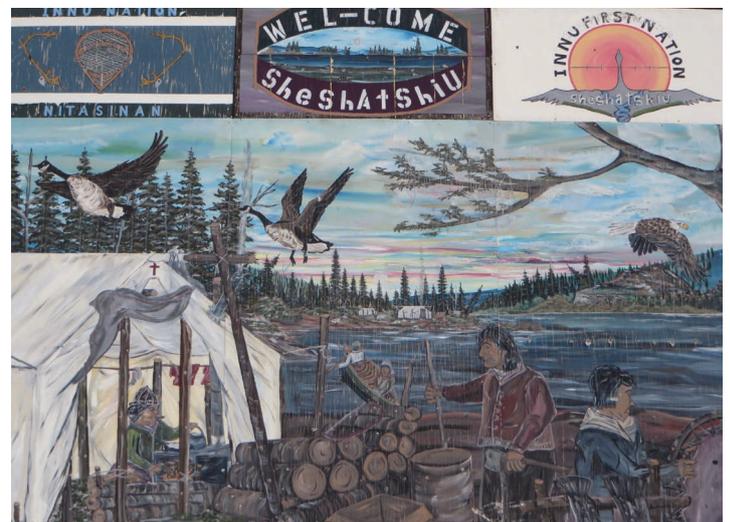
Artwork at the entrance to Sheshatshiu, a community of the Innu Nation, in Labrador (Canada).
Photo: A. Charles

10   For more information and to view the film, please see: www.communityconservation.net/nakatuenita-respect

We have been here for millennia after millennia learning from our grandfathers, brothers and sisters of the land – the animals; this is how we, the Innu, became human. Because everything from the Earth has been useful to us, it has taught us to treat and heal ourselves from the flora and fauna, and from what is used for the different daily lives of Innu.

We have learned through observations of the different species and their interactions with their surroundings and with other species like the Barren Ground Grizzly Bear's den, who we call *Matashu*, our sweat lodge because the bear's den is like the sweat lodge. And, in stories, Innu have lived with the Bear. The Bear taught us to pick boughs for our tent floors. And these respected animals have been our teachers of how to live and interact with nature and because of these, their teachings have been passed down through storytelling. Every animal has its own Innu story, and its interaction with its surroundings; no animal or plant is disrespected.

The Innu are the Maritime Archaic people and we were seafaring; we have names for the sea animals as well and stories that derived from the sea, so in all aspects of being Innu, we have lived. These stories are the same as with Algonquian speaking languages which, I believe, include the Innu, the Cree, the Ojibway, the Naskapi, the Mi'kmaq, the Blackfoot, the Cheyenne and the Mohicans, just to name a few. We have names for animals that have long been extinct like the woolly mammoth (*katshituask*), the camel (*kampuatau*) and animals that you would find in South America like the alligator (*tshishkutatak*) and the giant sloth (*katshintutashkunet*).[11] And in stories, they tell of the ice ages.

Today, we incorporate that belief and understanding of our natural world, and work on conservation and respect of the environment. Only an Innu can bring that knowledge 'to the table' in dealing with the ever-changing environment that we live in. We, the Innu Nation in Labrador, work with the Western science point of view for conservation, but do more – we cannot abandon our way of living with the natural world or our spiritual world, which are one and the same.

Our workers, because they are all hunters themselves, have this knowledge and grew up with their grandparents and parents, and gathered all this kind of knowledge from stories and going on the land with them. This is the traditional knowledge that Western science is always looking to gain. You are also trying to understand what the Innu Knowledge is, or what traditional knowledge is in comparison to Western Knowledge. Once, they had this group of scientists from different fields trying to ask our *Tshishennuat* (Elders) about the Innu way, Innu knowledge. I guess they tried – what do you call it? – a trick question to one of our Elders: "A certain waterfowl, do you know where this particular species of duck nest?". The Tshishennuat said, "Yes, we know where this certain species of duck nests." And the scientist asked them, "Where?", and the Tshishennuat, talking amongst themselves, said, "We won't tell you." And the scientist asked, "Why?". "Because everything that we tell you, you exploit, and you try and sell it for financial gain."

The Innu Nation has given our support in all kinds of conservation matters of the environment. The Akamiuapishkau Mealy Mountain National Park was the idea of the Innu, and we negotiated the Impact Benefit Agreement and all the cultural significance of the Innu land use for 10,700 square km in that area. We negotiated the Forest Process Agreement, where we saved a lot of habitats, including the Red Wine Caribou Reserve. We supported the Lac Joseph Wilderness Reserve, and are lobbying for the Eagle River Waterway Provincial Park.

Throughout all this, we have maintained our Innu values.

11   The spelling and pronunciation of these words may need more research.

9.3 Relationship and connection: Conservation Principles of the Nuu-chah-nulth Nation, West Coast of Vancouver Island

Contributed by **taaʔisumqa,** Dawn Foxcroft

ukłaamaḥ taaʔisumqa, ćišaaʔaqsup histaqšiλ nuučaanułatḥ. histakšiλaḥ ćumaaʕas. mamałńi ciic ʕimtii. Dawn Foxcroft.

My name is **taaʔisumqa**, I am a woman of Tseshaht from the Nuu-chah-nulth Nation. I am from Port Alberni, BC, Canada. My English name is Dawn Foxcroft.

My mother, Deb Foxcroft, from where my Nuu-chah-nulth lineage is from.

Growing up, she brought me and my sister along with her in boats, on floatplanes, walking down gravel roads alongside the ocean waves while she worked across the Nuu-chah-nulth territory. This gave me and my sister the opportunity to witness the strength, governance and relationships our people have with each other and to their environment.

In my early twenties, I began working with the Nuu-chah-nulth Tribal Council's (NTC) Fisheries, an aquatic resource management department called **Uu-a-thluk**, meaning 'to take care of' in our language. *Uu-a-thluk* supports all 15 Nuu-chah-nulth communities and is led by a council of **Ha'wiih** (Hereditary Chiefs). Here, my practice of being witness, listening and learning from our Elders, Chiefs and knowledge holders continued. In this work, I have been honoured to hold up our communities as they take care of our environment, learning about the interconnections between everything and how this knowledge is in practice through protocols, ceremonies and governance.

I am grateful for the wisdom and the teachings of our Nuu-chah-nulth communities passed on from our ancestors and the creator. These teachings help us, not just as Nuu-chah-nulth people, but as humans, to understand our connections and place as a part of everything around us. *Umeek*

(Richard Atleo), in his book **Ts'awalk** (Atleo, 2005), explains that unlike a Western scientific model where connection needs to be proven, Nuu-chah-nulth's worldview is based on the assumption that everything is interconnected. For me, this understanding is present in the teachings handed down by my grandmothers and aunties to speak to and pray to our relatives the trees, plants and creatures when harvesting for medicines, materials or food; the stories we are told about when we were once great whalers with the practices our whalers underwent before, during and after the hunt that connected them to the ancestors, environment and spiritual realm; and how the seats, or positions, of our *Ha'wiih* (Hereditary Chiefs) are directly connected to our creator, and the seat or position of Chief itself has a life.

Nuu-chah-nulth do not have a word that directly translates to conservation, but rather have deeply held principles and practices that guide our relationship with everything that surrounds us. It is from this understanding of interconnection when *Umeek* speaks about the Nuu-chah-nulth's 'conservation ethic'. For Nuu-chah-nulth, as for many Indigenous communities around the world, the principle, practice and application of what is referred to as 'conservation' is a western concept and can be problematic as it is typically enforced as a practice of 'no touch' and 'no use'. A Western 'conservation ethic' seems to imply that humans lack self-control when it comes to our environment, as seen in rules and regulations communicated through signage and policies enforced by conservation officers and fines. This type of conservation separates humans from the ecosystem and is outside of a Nuu-chah-nulth worldview.

Unlike a Western model, where the environment needs to be protected and kept away from people, Nuu-chah-nulth believe and practice *hishukish ts'awalk* (everything is one, everything is interconnected and nothing exists without the other), *iisaak* (respect with caring and action), and *uu-a-thluk* (to take care of). These principles cannot be put in practice without an ongoing active relationship between us, the sky, land, water, and all of the creatures in the environment. This deep relationship requires interaction, use, and maintenance.

We are an ocean people, the coastlines and the species we survive alongside with are at the core of who we are and who we are going to be as Nuu-chah-nulth people. In developing Uu-a-thluk Fisheries, the *Ha'wiih* (Hereditary Chiefs) outlined these principles – *hishukish ts'awalk, iisaak*, and *uu-a-thluk* – as the foundation for the work to be done. The work is not just about access and economics – it is about maintaining the important relationship we have to our ocean and waterways, a relationship that is at the foundation of our songs, dances, ceremonies, language and governance.

As Nuu-chah-nulth, in order for us to live into these principles and practices it is important for us to be in good relationship with ourselves and with everything around us. When we are healthy and thriving as Indigenous people in our lands, our environment equally thrives. Taking care of the ocean is not just the work of a department of the NTC – it is our way of life, a way of survival and what it is to be Nuu-chah-nulth.

The long, painful history of colonisation of Nuu-chah-nulth has damaged our relationship to our environment through theft of our lands and children, being persecuted for our language and culture, and not recognising our *Ha'wiih* authority to take care of their own territories. Despite this, I have witnessed *hishukish tsawalk, iisaak* and *uu-a-thluk* in how our Nuu-chah-nulth protocols and governance are held-up and practiced, in the way our *Ha'wiih* put these principles into action by protecting the herring stocks, even though the Canadian government wants to open herring to commercial harvesting, and how our language is used at our gatherings to share stories and teachings that enforce these principles and practices. The principles of *hishukish tsawalk, iisaak* and *uu-a-thluk* are spoken about often – we call this *haahuupa*, or teachings. I also witness how these are put into action to protect who we are as Nuu-chah-nulth and in turn our environment. They continue to remind and challenge us to recognise and practice our relationships, interconnections and responsibilities to ourselves and everything around us.

9.4 Translating conservation: The *Xichangana* concept

Contributed by Marta da Graça Z. Simbine

In environmental sciences, the term conservation means the set of actions that aim to preserve or restore the good quality of the biotic and abiotic components of a given ecosystem. However, in other languages, this word may not find a direct translation. *Xichangana* is one of those languages, where there is no word that expresses exactly the concept of conservation, that is, there is no word that itself is equivalent to the translation of the term 'conservation'. However, there are verbs, like *ku lhaissa,* which means, 'to care for' or 'to treat in a desirable way', and *ku vekissa*, which means 'to save well or properly' or 'to preserve'. Thus, both *ku lhaissa* and *ku vekissa* are translations of synonyms of the verb 'to conserve' and when properly contextualised, they express the concept that environmental sciences attribute to the word 'conservation'.

Accordingly, this essay explores the views of conservation held by local communities whose languages do not directly translate the concept of conservation as it is described in the environmental sciences. This contribution arises from research that seeks to analyse sacred forests based on the ecosystem services approach in order to contribute to their long-term maintenance (Simbine, 2020). Such research took place in the Limpopo District of southern Mozambique, in East Africa, through direct and participatory observation and semi-structured interviews involving 163 members of the communities of Chilaulene, Chirindzene Sede and Zongoene Sede.

These communities are in rural areas characterised by a matrix of agricultural crops, forest fragments, patches of vegetation and non-urban housing areas. In this region live the communities of *Machangana*, a part of the Tsonga ethnic group of the Gaza Province. There are two characteristics of the *Machangana* to mention here: their main language is Xichangana, and one of their most important traditions consists of worshipping ancestors through rituals often held by trees.

The rural *Machangana* communities of Limpopo District have a low level of schooling and purchasing power, which makes them highly dependent on natural resources. Traditional agriculture is the main source of income and to complement it, the communities exploit the native vegetation for the production of firewood or charcoal, obtaining construction material, producing household utensils and for medicinal purposes. In addition, they practice small-scale fishing and livestock husbandry, and eventually hunt as an alternative source for animal protein.

It is in the socio-cultural context described here that the rural communities of Limpopo District use the term '*kwati*' (in Xichangana) to refer to patches of vegetation or forest fragments. *Kwati* includes all types of terrestrial natural vegetation, regardless of the successional stage or degree of degradation or conservation status (locally designated *mafossi, xikuko* or *xilhalha*). However, three distinct views on *kwati* are highlighted:

Kwati near housing constructions: tend to be more undesirable the more advanced it is in successional stages. It is associated with providing shelter for animals that may represent some 'danger', or a place of socially repudiated activities. In these cases, people tend to destroy the *kwati* because it does not even represent scenic beauty.

Kwati distant from housing areas: where communities collect natural resources. Additionally, communities recognise that soils tend to be more fertile the more advanced is the successional stage of *kwati* it supports. Therefore, in case of the need for fertile soil for agriculture, people destroy the *kwati*, replacing native vegetation with agricultural fields.

Kwati la ntumbuluko: literally translated as 'traditional or cultural forest': a sacred forest. People do not call a forest fragment or patch of native vegetation in this category *kwati*, but instead *phalheluene* or *phalhelo* or *txuatxua* (in Chirindzene), terms that refer to the spirituality performed in these places. In addition, there is a person or a restricted group of people whose life history of their ancestors relates to the origin of the *kwati la ntumbuluko*, who has the responsibility of ensuring its preservation – the

Indigenous societies point the way to the future, in how conservation arises through an intricate cultural connection of the natural world and humans.
Photo: A Charles

guardians. Thus, there is a set of actions aimed at maintaining the *kwati la ntumbuluko* by a set of informal institutions that lead to total restriction (i.e. Phalhelo la ka Chirhaminhane Mhula, at Zongoene), or sustainable use of the forest resources (i.e. Phalhelo la ka Chirindza, at Chirindzene). These actions represent the conservation view of Limpopo District's local communities.

In essence, the view of conservation of the rural Machangana communities of Limpopo District resembles the conservation vision of the environmental sciences, since it also seeks to safeguard a given ecosystem due to its value. However, the difference between the two lies in the point that, while the conservation of forests in the view of the environmental sciences results from their ecological value, the main motivation for conservation for the rural communities of Limpopo District is its symbolic value. This difference in vision results in a difference in the criteria of evaluation of the conservation status. In the first case, the criteria focus exclusively on biophysical factors (i.e. fragment size, tree density and size, vegetation biodiversity). On the other hand, the Indigenous peoples also take into account social factors (cleanliness of the main entrance, existence of constructions and artefacts that symbolise the sacredness, respect for institutions, engagement of the local community in traditional ceremonies, and frequency of visitors).

To optimise the efforts of local communities, notably in Limpopo District, and conserve the remnant

Coastal Forests of East Africa (one of the 10 most endangered forest types in the world), it is important to consider these two views of conservation. By doing so, managers will be safeguarding both symbolic and ecological values of the sacred forest – as it is of vital importance to Limpopo District.

9.5 Conclusion

These reflections from the Innu of Labrador (eastern Canada), the Nuu-chah-nulth of British Columbia (western Canada) and the rural *Machangana* of Limpopo District of Eastern Africa illustrate the inseparability of peoples' spirituality and cultural psyche from their traditional landscapes.

The sense of spirituality is a lived experience of connection with something greater than the individual self. In this case, spirituality is integrated with the physical landscape, the driving forces of the natural world, while incorporating the stories of change over time.

Conservation is more than preserving or protecting physically defined ecosystems through scientific understanding. It includes the preservation of a deep inter-relationship between people, the landscape, and the powers that perpetuate and change it. It is a reciprocal and social relationship, one of mutual respect in which ritual, oral traditions and ceremonies act to embody and communicate important information and teachings of how to behave within this relationship (Sable & Francis, 2012).

As noted for the Innu in section 9.2, the animals and the land are teachers, which require behaving with respect. The legends are ways people learn from and pass down ancestral knowledge that has been key to peoples' survival – more than that, their happiness and cultural identity and connectedness to the landscape. Dawn Foxcroft explains how the teachings they receive include their ancestors in everything they do, and thus gives them a seamless vision for taking care of their future. As both she and Richard articulate, everything is inter-dependent. Thus, how people behave by these principles and apply their teachings is crucial to the health of the ecosystem as defined scientifically. Beyond that, how people behave in the present and according to long-

held traditions is the continuity of the past into the future and provides continuity of place and identity.

Similarly, according to the *Machangana*, the distinction between types of landscapes also requires attending to the spiritual connection and includes the symbolic value, which draws from long held practices of land use. All these practices protect the landscape and its cultural significance.

To translate 'conservation' implies including the spiritual and cultural meanings (Simbine, 2020). Eber Hampton of the Chickasaw Tribe of Oklahoma speaks of this spiritual orientation as how Indigenous peoples find their identity as an "unalienated self" (Hampton, 1995, p. 19), unalienated from the landscape they inhabit. The ultimate conservation is taking care of ourselves and, inseparable from this, is taking care of our environment, our larger 'self'. There is no real separation between us and the environment.

References

Atleo, E. R. (2004). *Tsawalk: A Nuu-chah-nulth worldview.* Vancouver, Canada: UBC Press. Available at: https://www.ubcpress.ca/tsawalk

Hampton, E. (1995). 'Toward a Redefinition of Indian Education'. In: M. Battiste and J. Barman (eds.), *First Nations Education in Canada: The Circle Unfolds,* pp. 5–46. Vancouver, Canada: UBC Press.

Sable, T. and Francis, B. (2012). *The Language of this Land, Mi'kma'ki*. Halifax, Nova Scotia, Canada: Nimbus Press.

Simbine, M.G.Z. (2020). 'Instituições Informais e Contribuições da Natureza para as Pessoas: Subsídios para a Conservação das Florestas Sagradas em Moçambique' (Informal Institutions and Nature's Contributions to People: Guidance for Conserving Sacred Forests in Mozambique). Doctoral Thesis (Ecology), Universidade Estadual de Campinas, Campinas, Brasil.

Chapter 10

Concluding synthesis and highlights

Anthony Charles and Fikret Berkes

The strong connections between conservation and livelihoods, at a local community level, have been strongly illustrated through the discussion in the preceding chapters. These connections are shown in the many different ways communities engage in environmental stewardship and conservation, and in building sustainable livelihoods and local economies.

Community conservation can arise through local choices, such as a fishing community that avoids harvesting in spawning areas, to restore fish populations, or a city neighbourhood that saves land for an urban garden, to improve food security. Community conservation can also appear as protests against outsiders damaging the local environment or as lobbying of governments for better policies to help communities sustain local ecosystems. The motivation behind these conservation efforts may combine the goal of safeguarding local livelihoods with the strong love of the place, the home, the community, where people live.

Against this backdrop of the diverse forms and motivations for community conservation, the book aims to provide understanding of, and support for, local communities seeking to achieve both environmental conservation and sustainable livelihoods. Also crucial is the related aspect of providing guidance to governments, and external players seeking to support local communities in their efforts. To accomplish these aims, the book has sought to address a series of major questions relating to community conservation: the 'why' and 'how' of conservation. Who gets to have a say in conservation/management, and what are their values and needs? How do we best deal with diverse livelihoods and actors?

To address these questions, the book adopted an SES lens, and drew on conservation-related knowledge and practice, as well as ideas of governance, to explore how communities, working together cooperatively, can improve their ability to conserve the local environment while building strong local economies. In the subsequent sections, some of the key results and conclusions from each chapter are compiled and synthesised, followed by an assessment of 'ingredients for success' for local communities effectively linking conservation and livelihoods, and a set of policy recommendations aimed at governments, concerning how best to support local communities with their conservation and livelihood initiatives.

10.1 Highlights by chapter

Chapter 1 – Introduction

The key goals of this book were to explore (a) interactions of conservation and livelihoods in local-level communities, (b) the actual or potential involvement of governments and civil society, (c) the values and goals that underlie decisions, (d) the institutions within which decisions are made, (e) the nature of success in conservation-livelihood linkages, and (f) the potential for increased attention within the conservation field to action at the local level. Also important is to understand how local community conservation initiatives can benefit both conservation and livelihoods when effectively supported by government policy and practice, and can use community knowledge to improve both economic and environmental outcomes.

Chapter 2 – Community-based approaches for linking conservation and livelihoods

The understanding of how decision-making about natural resource use and environmental conservation should take place has shifted over time. There is now increased appreciation of (a) the benefits of participatory approaches, with joint decision-making and **co-management**; (b) the importance of Indigenous and traditional ecological knowledge (TEK) and the knowledge of natural resource users; and (c) the need for greater attention to local-level community-based conservation and stewardship. This leads to a focus on community-based conservation and stewardship, which "…includes natural resources or biodiversity protection by, for, and with the local community, taking into account drivers, institutional linkages at the local level, and multiple levels of organisation that impact and shape institutions at the local level" (Berkes, 2007, p. 15193).

The CCRN has contributed to understanding and documenting community-based approaches for linking environmental conservation practices and sustainable livelihoods, and addressing how governments can better engage with local communities and Indigenous rights-holders. Through a unified SES perspective, the CCRN found that successful stewardship initiatives typically require certain key attributes: (a) community empowerment and strong relationships; (b) active and meaningful engagement of local communities and Indigenous rights-holders in decision-making; (c) adequate attention to sustainable livelihoods and local economies; and (d) supportive governments, in practice and policy, reflecting the values of local people.

Chapter 3 – Social-ecological systems (SES)

An SES lens adds an important capability for a more integrated, holistic and comprehensive understanding and implementation of community conservation. An SES lens, using the key concepts briefly reviewed in the chapter, helps in identifying models and approaches that can be effective in meeting both biological/ecological and social goals.

This, in turn, can help to empower communities as they work to maintain or restore their natural environments and local economies – guiding both communities and policy makers toward the same path of stewardship and livelihood sustainability.

As indicated in the Tokyo Bay example, the key elements are: the roles of collective action; the importance of **agency** and leadership; the effectiveness of **governance** and underlying aspects; the meaning of *conservation* within a given **worldview**; the drivers of environmental change; and the possibility of **transformation** 'toward sustainability through community-initiated conservation'. The integration of humans in nature shows that people have the capability to despoil their SES, but can also restore it, both ecologically and socially.

Chapter 4 – Meanings and motivations

- The meaning of 'conservation' differs amongst, and within, the different rights-holders, users and stakeholder groups associated with a particular resource. Further, meanings and motivations may differ across communities and social-ecological and cultural contexts but also within communities living in a particular geographical space.
- In seeking to examine whether motivations were addressed explicitly, implicitly or not at all, it was determined that 50% of the cases (community stories) addressed motivations explicitly, whereas 47% addressed it implicitly, leaving only one community not addressing motivations at all.
- Four local and Indigenous community motivations were found to be important: i) cultural institutions; ii) attachment to place, including a 'sense of belonging' and a 'sense of place'; iii) socio-economic needs; and iv) ethical responsibility. A large majority of the cases included each of these four types of motivation, with roughly equal frequencies.

Chapter 5 – Biodiversity outcomes

In surveying CCRN researchers, conservation was reported to be a primary (rather than secondary) objective in 39% of the community sites involved in the survey. Community initiatives whose primary

goal was biodiversity conservation had objectives including: to protect and/or restore species populations; to detect and understand changes in species and habitats; to relate impacts to human activities; and to understand the role of TEK. This is in contrast with initiatives whose primary goal was social, which focused on: participation in governance; building local knowledge of conservation; and interactions within SES, including livelihood implications and adaptations.

A separate assessment of drivers, across the set of CCRN community stories, identified seven categories of concerns: i) environmental impacts; ii) quality of ecosystems and habitat; iii) resource over-exploitation; iv) destructive resource uses; v) improving resource management; vi) climate change; and vii) exotic and endangered species. Three of these categories dealing with natural resources (over-exploitation, destructive use, management) dominated the results, arising in almost three-quarters of cases. The second most prevalent category involved environmental, ecosystem and habitat impacts, arising in over 50% of the cases.

Chapter 6 – Livelihood outcomes

Positive livelihood outcomes arose in the categories of conservation, economic, governance and social improvements. The analysis of cases found that: (i) overall, governance and social factors stood out in most of the cases; (ii) improved communication and information flows, and improved stewardship occurred in almost 70% of the cases; (iii) stronger relationships, community empowerment, leadership, social learning, and local cultural values, identity and sense of place were reported in over 65% of the cases; (iv) the most frequently reported conservation factors were: new conservation actions, monitoring resource use, identification of ecologically significant areas, new sustainable use practices, and new management plans; and (v) livelihood diversification occurred in 46% of the cases and household income increased in only 31% of the cases.

The findings suggest that community-driven conservation efforts can contribute to nature-based livelihoods providing positive outcomes. However, when top-down conservation initiatives constrained

livelihood options, the governance, social and economic dimensions of livelihood outcomes may be negatively affected.

Chapter 7 – Governance

Governance analysis of community stories found five major governance themes: (i) multi-level collaboration and engagement; (ii) access and management rights; (iii) social learning; (iv) knowledge co-production; and (v) leadership and capacity building. The first two and the last of these arose with more prominence. Specific insights relating to each of the governance themes were as follows:

A foundational governance ingredient is an institutional arrangement that fosters processes of **multi-level collaboration** and **participatory engagement**, and that helps to bring together multiple actors and perspectives.

- Policies and institutional arrangements to support communities included potentially innovative changes in **access and management rights** and/or **customary approaches**, sometimes in the context of co-management.
- Opportunities for *social* **learning** among different groups in ways that helped to challenge social relations of power among actors (civil society, government, industry) were key ingredients of governance for community conservation.

Governance processes that recognise and incorporate knowledge pluralism and/or **knowledge co-production** were ultimately needed to build a holistic, integrated understanding of complex systems.

A final ingredient evident across many cases was the importance of **leadership** and **capacity building** to overcome conflicts, build trust and generate knowledge, as well as to foster entrepreneurial activities for livelihood diversification.

Chapter 8 – Power

The assessment of power in community conservation focused on four main themes:

- **Power issues in the community conservation and livelihood context:** Economic development activities, territorial rights and access privileges; and policy making, enforcement and resource management in PAs.
- **Conservation and livelihood challenges linked to power:** Illegal entry by outsiders; depletion of resources; loss of access rights; restrictive government measures; increasing food insecurity and poverty; human mobility; multiple vulnerabilities resulting from environmental and economic development processes.
- **Community initiatives for addressing issues of power:** Social capital and leadership; strategic collaborations; institutions as the lifeline of community initiatives; role of women; power emanating from alternatives; social struggle, protests and legal action; community activism.
- **Practical outcomes related to power:** Community initiatives to organise; working together based on principles of cooperation, collaboration and participation; co-management that implies power sharing; and 'knowledge is power'.

Community stories show how individuals and communities are capable of defining their own power and formulating empowerment strategies. Community voices direct us to the fact that power may be, and often is, linked to external, antecedent factors. Community stories also help us to build a social-ecological image of power. They clarify that power rests in both the social and ecological domains, and takes shape through their dynamic interactions. Power reflects social-ecological reality in either facilitating or hindering community conservation and livelihood outcomes.

Chapter 9 – Indigenous perspectives

The review shows clearly how language and culture are crucial ingredients in understanding and carrying out conservation. The word 'conservation' often does not have a direct translation in Indigenous languages. For the Innu Nation (discussed by Richard Nuna and Trudy Sable), the Nuu-chah-nulth Nation (discussed by Dawn Foxcroft) and the Limpopo District of Mozambique (discussed by Marta da Graça Z. Simbine), it was noted that, respectively:

Koh Sralao village, in Cambodia, has a history of community organisation around resource conservation.
Photo: Furqan Asif

1   "The word respect is very powerful among the Innu. … Respect, because we only take what we need and leave something behind for another time, or other Innu, or other humans. Everything has to do with this. What do you call it? The circle of life; everything is connected. The word 'conservation' could be translated in that sense…"

2   "Nuu-chah-nulth do not have a word that directly translates to conservation but rather have deeply held principles and practices that guide our relationship with everything that surrounds us."

3   "*Xichangana* is one of those languages, where there is no word that expresses exactly the concept of conservation… However, there are the verbs, like *ku lhaissa*, which means, 'to care for' or 'to treat in a desirable way,' and *ku vekissa*, which means 'to save well or properly' or 'to preserve'."

Equally crucial are the values and principles involved. The Indigenous perspectives provided by Nuna, Sable, Foxcroft and da Graça Z. Simbine, respectively, highlight the following:

- "We, the Innu Nation in Labrador, work with the Western science point of view for conservation, but do more – we cannot abandon our way of living with the natural world or our spiritual world, which are one and the same."

- "Nuu-chah-nulth believe and practice *hishukish ts'awalk* (everything is one, everything is interconnected and nothing exists without the other), *iisaak* (respect with caring and action), and *uu-a-thluk* (to take care of). These principles cannot be put in practice without an ongoing active relationship between us, the sky, land, water and all of the creatures in the environment."
- "…the view of conservation of the rural Machangana communities of Limpopo District resembles the conservation vision of the environmental sciences, since it also seeks to safeguard a given ecosystem due to its value."

10.2 Ingredients for success in linking communities, conservation and livelihoods

Building on the above syntheses, this section draws on CCRN reviews of the efforts of local communities to link conservation and livelihoods. These key aspects could be called 'ingredients for success'. While not all are needed all the time, each of the ingredients incrementally adds to the possibilities for success. These ingredients arise in both community-based and large-scale conservation initiatives, and provide guidance for communities, policy makers and decision makers at all levels ranging from local to global. The ingredients of success are grouped into four categories: (i) SES and resilience; (ii) meanings and motivations; (iii) governance; and (iv) linking knowledge and practice.

10.2.1 Social-ecological systems (SES) and resilience

Using an SES perspective provides an integrated approach for undertaking community conservation, and for understanding how communities engage in environmental conservation in ways that support sustainable livelihoods and local economies. An underlying SES perspective is the key idea of resilience. Many studies and practical experiences have shown the importance of resilience as the ability to respond to, or absorb, shocks and stresses, while maintaining the functioning and identity of the system (SES).

Resilience can be seen as the capacity "of a system to absorb disturbance and reorganise while

undergoing change so as to still retain essentially the same function, structure, identity and feedbacks" (Walker et al., 2004). This capacity is especially important in a rapidly changing world. Local communities need the capability to persist (cope with change), adapt (with suitable adjustments) or transform if the pressure to change becomes overwhelming (Brown, 2016).

Resilience is relevant at all levels, and certainly for local communities (Berkes & Ross, 2013). Several factors are needed for building resilience (Folke et al., 2003). Fundamentally, key aspects to produce crucial collaborative, feedback-based problem-solving include: learning to live with change and uncertainty; nurturing ecological, cultural and economic diversity (for increasing options and reducing risks); creating opportunities for self-organisation (including fostering social memory); strengthening local institutions; building linkages and problem-solving networks; and sharing management responsibility.

10.2.2 Meanings and motivations

Three key insights relating to the meaning of and the motivation for local-level conservation have emerged from the studies described in this book:

- **Embracing the two-way connection between well-being of communities and the health of ecosystems** is a crucial starting point for community conservation. First, a healthy environment is crucial for communities. Community conservation, in maintaining or rebuilding healthy ecosystems, supports sustainable and diversified livelihoods of local and Indigenous peoples, and contributes significantly to the sustainability of local, regional and national economies. Conversely, strong and cohesive communities make it possible to have effective conservation efforts. This implies that to maintain healthy ecosystems, mechanisms are needed to ensure that conservation efforts effectively support communities, by ensuring adequate attention to the need for sustainable livelihoods that fully support local and Indigenous peoples. Conservation and livelihoods go hand-in-hand (Charles, 2017).
- **A focus on livelihoods is essential for effective conservation.** This is related to the

two-way connection mentioned above. The success of conservation initiatives, whether local or larger-scale, and whether initiated by a community, a government or others, typically depends on how they support the sustainable livelihoods of a full range of community members. This applies in planning economic development, embracing new livelihood alternatives that are resilient in the face of a changing climate and economy, and moving away from practices that have depleted the local environment. A diversity of local livelihoods can also be important, to give the community flexibility to move away from practices that deplete local resources, and to find more sustainable alternatives. Accompanying this will be efforts to support sustainable traditional livelihoods where feasible.

- **Values, respect and relationships are essential to achieving conservation success.** When efforts are made to reinforce and tap into the **values** of local people, both the support for and the effectiveness of conservation can be dramatically increased. Conservation initiatives that show **respect** for Indigenous peoples and local communities (IPLCs), and their traditional sustainable use and stewardship practices, can be more effective. Success is more likely when **relationships** are developed in a way that empowers people and their local communities to carry out their own conservation activities and to be involved in larger-scale efforts. Specifically, when governments and businesses build respectful partnerships with local communities, this enhances understanding and leads to more beneficial decisions.

10.2.3 Governance

Governance is about decision making, including sharing of responsibility and power, and setting the policy agenda and objectives. Thus, it must be highlighted that governance is not only for government. Within its realm, policy making involves setting the rules and guidelines for 'management', which is about action, i.e. 'management plans' and harvesting decisions. Indeed, it is clear that conventional top-down management has had severe limitations (Holling & Meffe, 1996). Modern approaches of adaptive management

and ecosystem-based management (EBM) take a broader view that is more comprehensive, that includes feedback learning, and takes uncertainty into account (Long et al., 2015; Berkes, 2012).

From a governance perspective, therefore, this shift reflects adaptive governance that is inherent in the efforts of many communities described in this book. It includes collaborative approaches and partnerships, notably co-management (sharing of power and responsibility between the government and local resource users) and knowledge co-production (see below), facilitated by good leadership and networks. Three major insights relating to governance for local-level conservation can be highlighted:

- **Community empowerment** reflects the capacity of local communities to seek out and implement local solutions to safeguard environments and livelihoods, and to participate fully in larger-scale initiatives (i.e. government-led ones). On the one hand, this leads to successful stewardship of local ecosystems by enabling local environmental conservation activities, which also supports the sustainability of local livelihoods and economies. At the same time, empowerment leads to better community engagement in larger-scale conservation, producing success in achieving stewardship of landscapes and larger ecosystems. Such larger-scale conservation decision-making must therefore be inclusive of the local level – rural and Indigenous communities, urban neighbourhoods, and municipalities.

- **Active and meaningful engagement** of local communities and Indigenous rights-holders typically leads to improved conservation and management practices. Conversely, excluding communities from resource decision-making increases the likelihood of conflict, unsustainable management and resource decline. Community and government initiatives all need to be *inclusive*, letting a full range of people take part – across gender, ethnicity and socio-economic status. This has many positive impacts, with greater buy-in and greater investment in community processes, broadening the reach of solutions. When the whole community is involved in addressing a problem, people are more likely to support the solution.

- **Government support** raises a community's chances of success. Notably, local community conservation initiatives benefit when supported by government practice and policy. Governments (and in some cases, businesses and other organisations) can be positively engaged through funding, expertise, active support and helpful policies. Accordingly, government policies and regulations support progressive community action, and government resources flow towards workable solutions. Nevertheless, the evidence suggests that government support is not necessary in all circumstances.

10.2.4 Linking knowledge and practice

Knowledge production is crucial in linking communities, conservation and livelihoods. Specifically, sustainable livelihoods and more effective conservation require **using all sources of knowledge** as a means to improve problem solving. Indeed, appropriate environmental conservation and management practices must draw on the in-depth knowledge of local and Indigenous communities. Utilising a wide range of traditional and local knowledge is crucial, and knowledge sharing leads to better community engagement and more workable outcomes.

The creation of pathways for sharing education and knowledge is an important ingredient in communities that have succeeded in conserving both their natural environment and local livelihoods. This was seen in the case of Port Mouton Bay, Nova Scotia (Canada) where fishers and independent scientists together built a knowledge base, from many sources, to assess aquaculture impacts on the local fishery (Charles et al., 2020). Depending on the context, the multiple forms of knowledge might include: (i) traditional ecological knowledge (TEK), i.e. a cumulative body of knowledge, practice and belief, evolving by adaptive processes, and handed down through generations by cultural transmission; (ii) Indigenous knowledge, i.e. the local knowledge held by Indigenous peoples or local knowledge unique to a given culture or society; and/or (iii) local knowledge, i.e. practitioner knowledge which is not multi-generational (Berkes, 2018). Related to these is Indigenous local knowledge (ILK), the term used

Local children of Olifantsdrif village near the Olifants Estuary (South Africa). The well-being of youth and future generations can provide a strong motivation for community conservation.
Photo: Wayne Rice

by IPBES and defined as for TEK above (Díaz et al., 2018).

The process for knowledge creation is also important. The desired approach for increasing the range of knowledge for learning and problem-solving has brought together all those involved, working together to define the important questions and the knowledge generation approaches (Clark et al., 2016), drawing different knowledge sources jointly (Armitage et al., 2011) and embarking on knowledge co-production and participatory research. As such, communities can increase their own understanding of change through, for example, 'community science' (Charles et al., 2020). The process of learning collectively bridges different kinds of knowledge respectfully, such as combining science and local observations to respond to climate change, taking into account issues of values and equity.

10.3 Policy recommendations for governments

The support of governments and other external players can be important, although not necessarily essential for community livelihood and conservation success. There is evidence that governance can run more efficiently if the government supports small-scale, community-based initiatives. Accordingly, governments and other players should recognise that their own conservation actions can be improved by involving local communities and community knowledge.

From this perspective, the following key approaches are recommended:

1 **Acknowledge the role and expertise of local communities.** Engage communities on a variety of levels, with both scientific and management agencies working directly with communities.

2 **Ensure that government resources are targeted for community conservation**, and that policy not only pays attention to, but actually 'mainstreams' the conservation potential of local communities. Management agencies should align their programmes and resources to be effective at the local level.

3 **Ensure that policy-making takes into account its effects on communities,** where government programmes fit with realities at the local level and government conservation policy considers impacts on communities.

4 **Seek and explore examples of successful management models** that address community concerns, and support opportunities to learn about and implement them.

5 **Build local capabilities for communities to develop their own knowledge base and their sustainable livelihood options.**

6 **Seek opportunities to 'scale up' from community successes** to improve large-scale management, and 'scale down' high-level initiatives to help local efforts.

As noted at the beginning of the book, the efforts of local communities in environmental stewardship that support sustainable livelihoods can be an important vehicle for achieving the SDGs (UN DESA, n.d.). Governments and civil society around the world have pledged to work toward the SDGs, and an effective way to do that may well be through empowerment and policy support to local communities and their local stewardship actions. As has been shown earlier in the book, the practical and policy support by governments can, with the right support, lead to improved local environmental conditions and contribute to meeting the SDGs, such as SDG 14 (*Life Below Water*) and SDG 15 (*Life on Land*), improved

human well-being, such as SDG 1 (*No Poverty*), SDG 5 (*Gender Equality*), SDG 8 *(Decent Work and Economic Growth)*, and better paths to meeting cross-cutting goals, such as SDG 11 *(Sustainable Cities and Communities)* and SDG 13 *(Climate Action)*.

10.4 Conclusions

Local communities, around the world, in cities and in rural areas, are on the frontlines of many environmental challenges. Their stewardship efforts are inspiring, and help to support sustainable local economies. The successful conservation practices of communities embrace the fundamental links of protecting livelihoods and the environment, using community decision-making to improve both conservation and community well-being.

The CCRN sites, including those highlighted in this book (Table 1 and Figure 1), provide a fairly good sampling of regions and countries. Even though there obviously are differences from one region to another and from one site to another, our findings are (perhaps surprisingly) consistent. That is, there are more similarities than differences in the community conservation experience with respect to motivations, challenges and opportunities across the spectrum – from industrialised Western countries to developing nations, whether located in Asia, Africa, or the Americas.

While this book has laid out a path toward successful community-based conservation and sustainable livelihoods, issues of power imbalances can thwart such efforts and indeed, communities may find themselves engaged not in actions that move them directly toward better environmental and social outcomes, but rather in struggles against external forces that threaten both the environment and the well-being of communities. This reality must be recognised: to achieve the benefits of community conservation, there must be the right local conditions and suitable policy support, combined with broader considerations of equity and social justice.

Community initiatives are undoubtedly challenging at times, and not always successful, but the evidence suggests that with the right support, communities can combine multiple sources of knowledge, adopt

an integrated perspective, and utilise participatory and cooperative approaches, to restore ecosystems, safeguard important natural areas, build secure local economies and monitor change over time. In this way, they can meet both conservation and livelihood goals, and resolve both environmental and livelihood challenges, perhaps even overcoming otherwise intractable problems.

Many of the successes of local communities happen 'under the radar', perhaps even unknown to their respective national governments – as larger-scale initiatives have tended to receive much more attention and funding. There may be a need for an appropriate 're-balancing' across levels of action and decision-making. This fits closely with the emerging consensus on the need for a multi-level and cross-scale approach to governance, taking into consideration costs, capacities and institutional arrangements, and the relative benefits of engaging at each level of decision making. Indeed, from that perspective, community-based approaches are well-placed to draw on the major thrusts in modern conservation, notably for more participatory governance. An increased focus of governments on the local scale of the community could expand and 'scale-up' the benefits of local-level conservation, as demonstrated so clearly throughout this book.

References

Armitage, D., Berkes, F., Dale, A., Kocho-Schellenberg, E. and Patton, E. (2011). 'Co-management and the co-production of knowledge: Learning to adapt in Canada's Arctic'. *Global Environmental Change* 21(3): 995–1004. Available at: https://doi.org/10.1016/j.gloenvcha.2011.04.006

Berkes, F. (2012). 'Implementing ecosystem-based management: evolution or revolution?'. *Fish and Fisheries* 13(4): 465–476. Available at: https://doi.org/10.1111/j.1467-2979.2011.00452.x

Berkes, F. (2018). *Sacred Ecology.* 4th Edition. New York, USA and London, UK: Routledge. Available at: https://doi.org/10.4324/9781315114644

Berkes, F. and Ross, H. (2013). 'Community Resilience: Toward an Integrated Approach'. *Society & Natural Resources* 26(1): 5–20. Available at: https://doi.org/10.1080/08941920.2012.736605

Brown, K. 2016. *Resilience, Development and Global Change.* First edition. London, UK: Routledge. Available at: https://doi.org/10.4324/9780203498095

Charles, A. (2017). 'The Big Role of Coastal Communities and Small-Scale Fishers in Ocean Conservation'. In: P.S. Levin and M.R. Poe (eds.), *Conservation for the Anthropocene Ocean: Interdisciplinary Science in Support of Nature and People*, Chapter 21, pp. 447–461. Amsterdam, The Netherlands: Academic Press, Elsevier. Available at: https://doi.org/10.1016/B978-0-12-805375-1.00021-0

Charles, A., Loucks, L., Berkes, F., Armitage, D. (2020). 'Community science: A typology and its implications for governance of social-ecological systems'. *Environmental Science & Policy* 106: 77–86. Available at: https://doi.org/10.1016/j.envsci.2020.01.019

Clark, W.C., van Kerkhoff, L., Lebel, L. and Gallopin, G. (2016). 'Crafting Usable Knowledge for Sustainable Development'. *PNAS* 113(17): 4570–4578. Available at: https://doi.org/10.1073/pnas.1601266113

Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R.T., Molnár, Z., Hill, R., Chan, K.M.A., Baste, I.A., Brauman, K.A. et al. (2018). 'Assessing nature's contributions to people'. *Science* 359(6373): 270–272.

Folke, C., Colding, J. and Berkes, F. (2003). Building resilience and adaptive capacity in social-ecological systems. In: F. Berkes, J. Colding and C. Folke (eds.), *Navigating Social-Ecological Systems*, pp. 352–387. Cambridge, UK: Cambridge University Press. Available at: https://doi.org/10.1017/CBO9780511541957.020

Holling, C.S. and Meffe, G.K. (1996). 'Command and Control and the Pathology of Natural Resource Management'. *Conservation Biology* 10(2): 328–337.

Long, R.D., Charles, A., and Stephenson, R.L. (2015). 'Key principles of marine ecosystem-based management'. *Marine Policy* 57: 53–60. Available at: https://doi.org/10.1016/j.marpol.2015.01.013

United Nations Department of Economic and Social Affairs (UN DESA) (n.d.). 'The 17 Goals'. *UN DESA* [website]. Available at: https://sdgs.un.org/goals

Walker, B., Holling, C.S., Carpenter, S.R. and Kinzig, A. (2004). 'Resilience, adaptability and transformability in social-ecological systems'. *Ecology and Society* 9(2): 5 [online]. Available at: https://doi.org/10.5751/es-00650-090205

Postscript

Anthony Charles

The vast majority of this book was written prior to the COVID-19 pandemic, including all the chapters and all the Community Stories. However, with the book being published in the middle of the pandemic, it is important to give some consideration to what this means in relation to the theme of the book – *Communities, Conservation and Livelihoods*. We begin with a brief look, through a local community lens, at the impacts of the pandemic and some of the responses, then turn to how the links of communities, conservation and livelihoods highlighted throughout this book may be affected by and evolve in a pandemic world.

Impacts of the pandemic and community responses

The pandemic has had incredible negative impacts worldwide on health and well-being, as well as on livelihoods. At a community level, the pandemic has affected almost every aspect of life. A survey in one location (Nova Scotia, Canada) of COVID-19 impacts on local communities, and the range of their responses, may give some indications (Charles et al., 2020). The survey finds that communities were affected in such areas as: health and access to medical services; food security and insecurity; employment and livelihoods; social and recreational activities; childcare and schools; facilities and services for seniors; and public space and facilities. There are also changes apparent in how local communities are operating, whether resulting from the pandemic itself or from restrictions put in place as responses. This could include, for example, changes in community decision-making arrangements, or in social or cultural activities, that affect quality of life.

Economic impacts affecting communities arose in the retail, food services, healthcare, education, transportation, personal services, government, infrastructure and natural resource sectors. The impacts on the natural resource sector are seen around the world. For example, in coastal fishing communities, Bennett et al. (2020) report reduced capabilities to go fishing (due to distancing requirements) and a loss of access to markets (due to broken transportation links). They note particular risks to "rural and isolated indigenous communities" that "may have reduced immunity and access to healthcare" (p. 339).

The disruption is extreme in many places, but local communities are also responding. Pandemic-related community responses may be immediate (i.e. shifts in employment, access to food, or services offered in the community) or more long-term (i.e. changes to economic sectors or to how jobs operate). Such responses can be driven by individuals or groups in the community, or by higher levels of government. The responses can vary depending on how they were funded, who is served by the actions, and the gaps designed to fill in the social, economic and environmental needs of the community.

Around the world, the list of constructive COVID-19 responses, taking place within local communities, is growing daily. Notably, IUCN and its Commission on Environmental, Economic and Social Policy (CEESP) are compiling a range of such cases (IUCN CEESP, 2020). Such responses may be seen in all parts of the world – for example, in coastal communities (Bennett et al., 2020), there are many instances of food sharing. This is demonstrated in Hawaii, where "the local food movement has grown substantially… helping to supply vulnerable populations (elders) and food banks", and the Pacific Islands, who are benefiting from "strong existing social networks" (p. 339). There are also cases (Bennett et al., 2020)

in which communities "have acted collectively to reassert their rights to food, livelihoods, or safe working conditions" and have worked to maintain livelihoods (i.e. in Sri Lanka, with efforts to "rebuild local supply chains as imports have fallen…" (p. 340).

Communities, conservation and livelihoods in a pandemic world

The impacts of the pandemic on health, quality of life and livelihoods have been extensive in local communities the world over. The responses of communities have been, in many cases, equally impressive. But what have been the environmental impacts, and the conservation responses, at the community level? How are we seeing the pandemic affecting the linkages between environmental conservation and livelihoods at the community level? And what might the future hold, as communities grapple now with the pandemic, and with ongoing conservation and livelihood challenges?

COVID-19 reminds us above all how interconnected Planet Earth is. No part of the planet has escaped the pandemic. As with the impacts of climate change, no place and no one is immune. Just as for the challenge of climate change, clearly not all pandemic concerns arise on a local level, nor can they be solved at a local level. There are limits to the extent that local communities can deal with forces as global as climate and pandemics.

A second point, from an environmental perspective, is that underlying the pandemic outbreak are critical questions about the complex connection of how humans interact with wild species. There is much to learn in that regard, and all the evidence has yet to emerge.

Nonetheless, we can see mixed impacts of COVID-19 on the environment. On the one hand, in industrialised countries, the economic downturn resulting from the pandemic may have led to some improvements in environmental conditions, such as reduced air pollution and pressure on natural resources. This is not cause for celebration, given the immense negative effects of the pandemic, but it is worth noting. Indeed, there is some thought being given to the possibility that our economic

future could be made stronger, more sustainable and more equitable, by re-designing economic activities in a way that makes those environmental benefits permanent, even as the pandemic threat is removed and livelihoods are restored and sustained.

At the same time, there is no doubt that in the short term, it is challenging to focus on conservation activities (and climate action) when health and welfare are threatened immediately by the pandemic in many places. Thus, on the negative side, it seems that many of the conservation practices documented in this book may not have been maintained as usual. Local communities, like nations and whole societies, are facing this reality. In the longer term, however, the ultimate message reflected throughout this book must be committed to our collective memory: conservation practices (and climate action), on the one hand, and human well-being and sustainable livelihoods, on the other hand, are inextricably linked. The set-back due to COVID-19 must be only temporary.

Into the future

What does the future hold, as communities grapple today with a pandemic and continue to face a range of ongoing environmental conservation and sustainable livelihood challenges?

The insights provided in this book reinforce a crucial point in moving into the future, a point highlighted over the past decades by Nobel Prize winner Elinor Ostrom and many others: the crucial power of 'collective action' – when people, coming together in communities, meet their challenges by working together.

In the midst of the COVID-19 pandemic, the need for collective action has never been greater. Some of that collective action can be seen at a large scale, across nations, but it is also very apparent within local communities the world over.

While the Covid-19 pandemic, like climate change, affects us all globally, the same lesson about the importance of collective action holds when the challenges faced by local communities are more localised. We have seen many such challenges

in the instances cited in this report – often in the form of threats, from outside forces, to the local environment or to local livelihoods. Communities trying to conserve their local resources and support local livelihoods are forever engaged in struggles with many external forces.

The ingredients needed to move forward are contained within the many inspiring stories of collective action – both in this book, as communities address and in many cases solve local challenges of environment and livelihoods, and in recent examples of local communities tackling pandemic challenges worldwide. It is not an easy path, but one that can help us to 'build back better' into the future.

References

Bennett, N.J., Finkbeiner, E.M., Ban, N.C., Belhabib, D., Jupiter, S.D., Kittinger, J.N., Mangubhai, S., Scholtens, J., Gill, D. and Christie, P. (2020). 'The COVID-19 Pandemic, Small-Scale Fisheries and Coastal Fishing Communities'. *Coastal Management* 48(4): 336–347. Available at: https://doi.org/10.1080/08920753.2020.1766937

Charles, A., Sweeney, L., Dean, L. and Zimmerman, R. (2020). *Nova Scotian Communities & COVID-19: Challenges and Resilience*. Saint Mary's University, Halifax, Nova Scotia. Available at: https://www.communityconservation.net/nova-scotian-communities-and-covid-19/

International Union for Conservation of Nature (IUCN) Commission on Environmental, Economic and Social Policy (CEESP) (2020). 'CEESP Newsletter' [online]. *IUCN CEESP* [website]. Available at: https://www.iucn.org/commissions/commission-environmental-economic-and-social-policy/resources/newsletters

Community stories

Photo: Holladay Photo by Mark Holladay Lee

Figure 7 Geographical overview of community stories

Koh Sralao

Koh Pitak Island

São Luiz do Paraitinga
and Catuçaba

Vila dos Pescadores,
Cubatão

Chilika Lagoon

Pando and Beni
Departments

Qeshm Island

Punta Allen, Quintana Roo

Tsitsikamma

Olifants Estuary

Halifax, Nova Scotia

Clayoquot Sound

Haruku village,
Maluku Province

Les Village, Bali
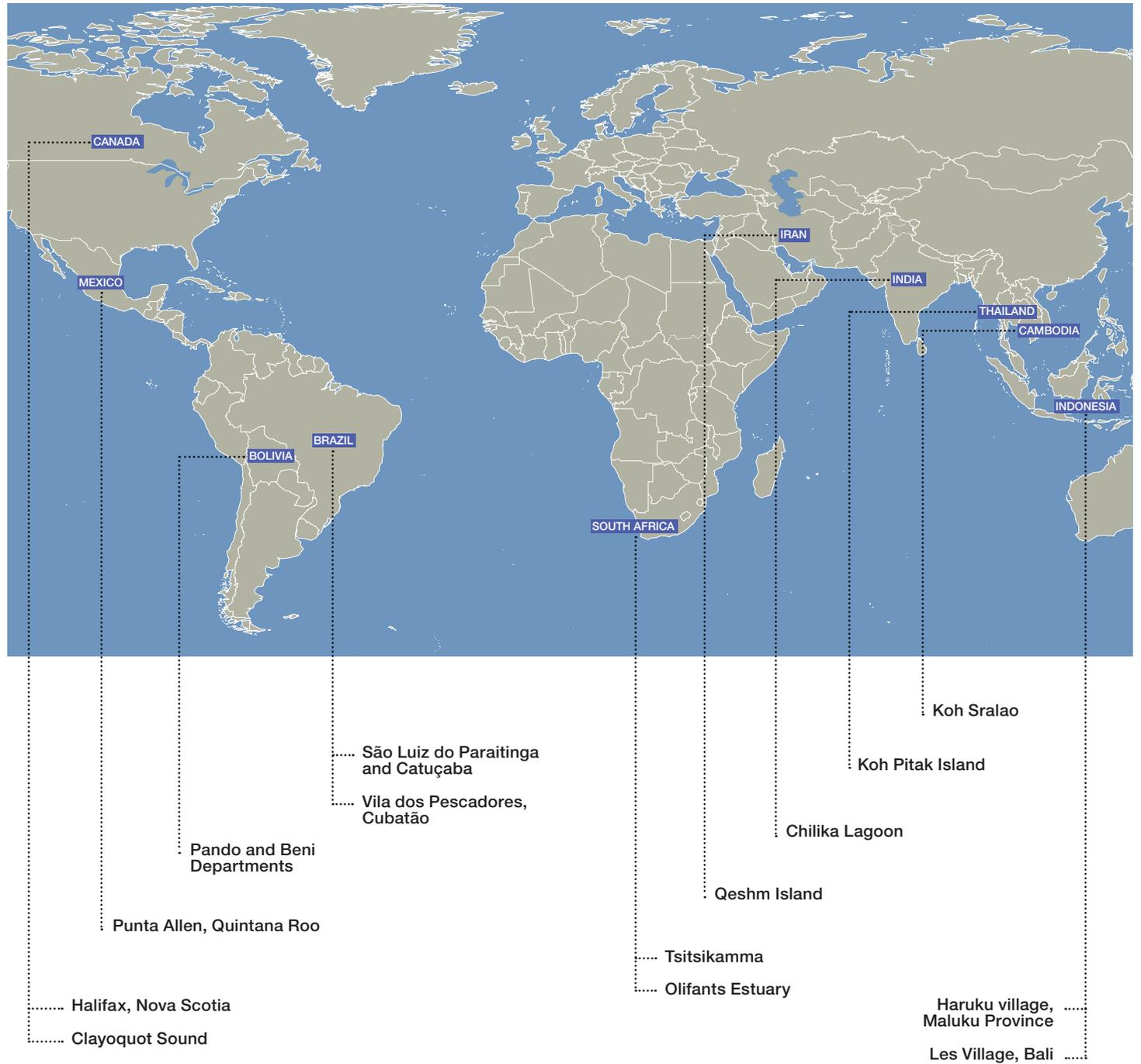
Source: Based on United Nations World Map (2020).

Introduction to community stories

Anthony Charles

This part of the book contains 14 Community Stories, each providing a compelling real-world example of engagement in community conservation, linked to sustainable livelihoods. Of the 14 stories, the initial set of 10 focus on specific local communities and the subsequent set of four deal with the communities located within a larger region. The Community Stories are geographically diverse, coming from a variety of locations around the world. They also reflect a diversity of challenges, and responses to those challenges, at the local level. Some reflect clear successes, while others are nuanced, with elements of both success and (perhaps) failure – or at least, unresolved challenges.

The stories all reflect initiatives that are undertaken by communities (or on-the-ground regional bodies) themselves, even if supported in some ways by external entities, including some of the organisations represented within the CCRN. The stories are, accordingly, written from the perspective of the community, not of those engaged in the research about that community. (Since the CCRN approach is one of participatory action research, the communities themselves, or members of them, were typically involved in the studies, but the focus here is on the community and its experience, not the research process.)

Any accounts such as these necessarily reflect the perspective of the authors; as a result, readers will see considerable diversity in the approaches taken for the various Community Stories. There is, however, a common structure used in all the stories. After a list of 'key messages', each story is presented in four parts:

1 Community profile
2 Conservation and livelihood challenges
3 Community initiatives
4 Practical outcomes

The idea is to first describe the nature of the community (or region), then address the challenges being faced – whether environmental, or involving social, economic, cultural or governance aspects – followed by the community's initiative(s) in response to those challenges, and the resulting outcomes. As reflected in Part I of the book, the approach considers both biodiversity outcomes and livelihood outcomes, although the extent to which each of these is discussed varies with the nature of the Community Story (and the aims of the communities themselves).

In addition to the Community Stories within this book, others are available on the CCRN website (CCRN, 2020), as well as in CCRN's documentary *Sustainable Futures – Communities in Action*, other CCRN videos and animations, and the book Governing the Coastal Commons (Armitage et al., 2017).

Many 'stories' are also available from NGOs, international agencies, research bodies and more. Most strikingly, in local communities the world over, the links of sustainable livelihoods and environmental stewardship are active today, providing continuing inspiration to us all.

References

Armitage, D., Charles, A., Berkes, F. (eds.) (2017). *Governing the Coastal Commons: Communities, Resilience and Transformation*. Oxford, UK and New York, USA: Earthscan, Routledge/Taylor & Francis. Available at: https://doi.org/10.4324/9781315688480

Community Conservation Research Network (CCRN) 2020. 'Community Stories'. *CCRN* [website]. Halifax, Canada: Community Conservation Research Network, Saint Mary's University. Available at: www.communityconservation.net/community-stories

Koh Pitak Island, Thailand Community conservation revitalises livelihoods and marine resources

Dachanee Emphandhu and Philip Dearden

Figure 8 Map of Thailand and location of Koh Pitak Island

Key messages

- Conservation initiatives, such as habitat creation and fishing restrictions, have improved the biodiversity around Koh Pitak Island.

- Establishing a community-based tourism industry enabled further development of lower-consumptive activities to support island livelihoods and reduce dependence on marine resources.

- Community conservation on Koh Pitak Island was successful due to leadership, social capital, distributional equity, tourist attractions, media interest, village culture, support network and timing.

Community profile

Koh Pitak is an island ecosystem located approximately one km off the coast of Chumporn Province in the Gulf of Thailand, in Bang Num Jeud Sub-District, Luang Suan District (Figure 8). The area of the small, relatively steep island is 113.92 ha, about one-half consisting of natural vegetation and the rest mainly coconut plantation or housing. The island is inhabited by about 45 related households, the majority of whom are Buddhist. Koh Pitak was established over a hundred years ago by fishers who took shelter along its coasts. The abundant sea resources surrounding the island allowed the community to flourish (Dearden et al., 2016).

Conservation and livelihood challenges

The marine environment around Koh Pitak Island was formerly very productive and diverse but suffered rapid decline around 20 years ago due to over-fishing and pollution. The decline in marine resources led the island community heavily into debt – a situation faced by many Thai fishing communities during this period (Dearden et al., 2016). Senior levels of the government were unresponsive to the plight of the community.

Community initiatives

Conservation was seen at Koh Pitak as being an essential element of livelihood recovery. The community, under charismatic leadership, recognised that they themselves were partially to blame for the environmental degradation that had occurred and designed initiatives to reverse this trend. Some of these initiatives included:

- Establishing a community-based tourism industry that enabled further development of lower-consumptive activities to support island livelihoods and reduce dependence on marine resources;
- Creating an artificial reef which enhanced marine biodiversity and provided supplemental income for fishers;
- Protecting marine resources through seasonal closures, zoning and the use of grow nets;

Interviewing two of the main exponents of the 'garden culture'
Photo: Philip Dearden

- Designating a local no-take zone where villagers seed giant clams; this site has become popular for dive and snorkel tourism;
- Restoring mangrove populations along Koh Pitak's shoreline;
- Improving waste disposal through the use of micro-organisms that rapidly digest organic waste. The treated wastewater from this system is then used to develop and water home gardens. These gardens have become a popular tourist attraction, where the village teaches visitors how to create such gardens; and
- Initiated a study to understand the tourism carrying capacity of Koh Pitak by monitoring water quality, waste and the quality of visitor experience (Dearden et al., 2016).

"I want it to be like it was 30 years ago, with the seas full of fish…"

Headman of Koh Pitak regarding their main goal for conservation

Influencing marine policies

As for all other coastal communities in Thailand, Koh Pitak is ostensibly governed by the same fisheries laws, rules and regulations of the country. However, through their own initiative, the community has managed to create unprecedented flexibility in this respect that is of national importance. One example is the stewardship of a local island, Koh Kram, about 1 km further offshore Koh Pitak.

Although Koh Pitak is now known for its community-based tourism, it is still a fishing village. Community conservation has facilitated the return of a productive fishery.
Photo: Philip Dearden

Koh Kram has the best remaining biodiversity in the area and is part of a larger national park, Mu Koh Chumporn. Nevertheless, the administration of Mu Koh Chumporn has allowed the villagers to have stewardship over the island who, in turn, have developed a no-take fishing zone and oversee a reseeding and enhancement of giant clams in the area. They are allowed to enter and leave as they wish and take tourists there. This kind of practical relationship between the Thai National Parks Department and local communities is very rare.

Another important example is the current revision of the Thai National Fisheries Law to recognise the abilities of communities, such as Koh Pitak, to manage their own fisheries. Although Koh Pitak figures prominently, it is not the only fishing community to be recognised in this area. Interestingly, the community has elected to have a smaller ocean area for than permitted under the proposed bill, due to a practical recognition of their own limitations in patrolling a larger area.

Although the ever-changing constitutional landscape of Thailand embraces decentralisation, it is usually more in terms of theory than practice in a centuries-old hierarchical society. The attempts which are now being made to allow more local control are at least partly the result of the demonstrably successful coastal management practices shown by communities such as Koh Pitak.

Practical outcomes

The success observed on Koh Pitak Island can be attributed to several factors:

Leadership. A charismatic, far seeing and powerful village leader was critical to the transformations.

Community social capital. The community has very high social capital and unity due to their interrelatedness and common history.

Distributional equity. Activities are undertaken by groups; a proportion of all income is returned to the community fund with full transparency.

Tourist attractions. Koh Pitak does not offer the coastal tourism attractions typically associated with Thailand, such as long, white sand beaches and azure blue seas. Had it done so, it is quite likely that the island would have already been consumed by mass tourism. The tourist attractions are more suited to the kind of community-based tourism that has developed there.

Media interest. There has been significant media interest in the transformation of the village, providing ample free marketing for tourism.

Village culture. The village enjoys a slow pace of life that is well suited to low-key tourism development.

Support network. The village enjoyed an extensive support network ranging from government agencies, institutions (such as universities) and other villages developing community-based initiatives.

Timing. The conservation and tourism initiatives coincided with the growing popularity of the Thai King's 'self-sufficiency' philosophy, which promotes small, local, low-impact development and living a moderate, self-dependent life without greed or overexploitation of, for example, natural resources.

"For me […] conservation cannot be done by only one person, or by one community. It must have collaboration among communities and organisations that we call it 'our conservation network'. It is a network of conservation in many aspects: giving ideas, supporting each other and working together. Conservation is not only at our homeland but covers from mountain to the sea. This conservation network is like a jigsaw that missing one piece can bring a whole mission down."

Koh Pitak village head sharing
his thoughts on conservation

Reference

Dearden, P., Emphandhu, D., Songpornwanich, S., and Ruksapol, A. (2017). 'Koh Pitak: A Community-Based, Environment and Tourism Initiative in Thailand'. In: D. Armitage, A. Charles, F. Berkes (eds.), *Governing the Coastal Commons: Communities, Resilience and Transformation*, Chapter 10, pp. 181–197. Oxford, UK and New York, USA: Earthscan, Routledge/Taylor & Francis. Available at: https://doi.org/10.4324/9781315688480

Acknowledgements

Koh Sralao, Cambodia Seas of change in a coastal fishing community

Furqan Asif, Jason Horlings and Melissa Marschke
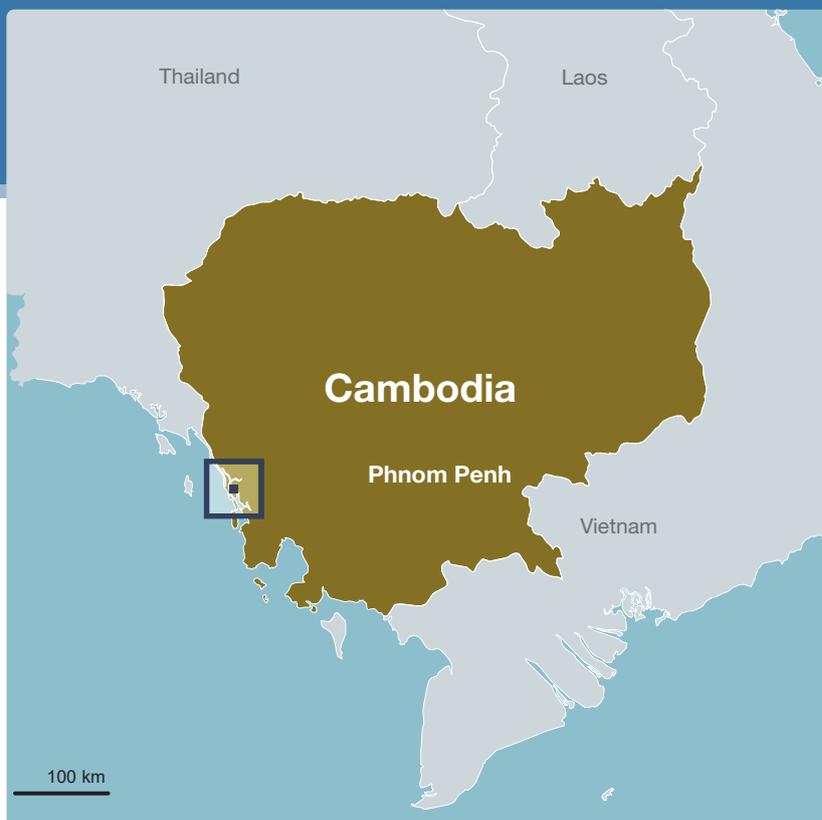
Figure 9 Map of Cambodia and location of Koh Sralao

Key messages

- The Koh Sralao community works together to safeguard mangrove forests which form a critical link to their livelihood.

- Community activism concerning coastal resource management issues and resistance to sand dredging contributed to the termination of nearby dredging activities.

- The development of a Special Economic Zone in the provincial capital has provided valuable economic opportunities for young women, contributing to livelihood diversification.

Community profile

Koh Sralao is a small 300 household mangrove-estuarine fishing village on the southwestern coast of Cambodia (Figure 9), approximately 22 km from the provincial capital Koh Kong. The village is accessible only by boat. Given the remote nature of the community, most goods and products need to be shipped in and out.

Villagers rely heavily on the marine environment, with fish making up the bulk of their dietary protein. The local marine resources have been the source of sustenance and livelihood for many decades. Although the main activity is crab fishing, a diversity of fishing activities is found, including green mussel culture, shrimp and grouper fishing (Marschke, 2016).

Local fishers use mechanised boats and gill nets or crab traps to harvest the marine resources in and around the mangrove estuarine area, or within a few kilometres of the coastline. Households work together, with men (sometimes with their wives or hired workers) going out to fish daily or spending a few days on their boats and women sorting, processing and selling aquatic products to a handful of local traders (aquatic products typically go to the provincial town, and then may move to Cambodia's capital or into Thailand).

However, sustaining a small-scale fisheries livelihood is challenging (Marschke, 2012) and livelihoods have diversified within and beyond the village. For example, households may have family members working (temporarily or permanently) in construction or factory jobs. While this work has typically been in another province either in Cambodia's capital or in Thailand, there are now wage labour opportunities particularly for young women in the provincial capital at the special economic zone (SEZ) near the border with Thailand.

Conservation and livelihood challenges

Declining fish populations
Fishers have spoken about fish declines for decades (Marschke, 2012) and continue to be concerned

A barge carrying sand from sand mining operations in Koh Kong.
Photo: Furqan Asif

about fish stocks. The observations made by Koh Sralao fishers are consistent with statistics for the Gulf of Thailand which shows a dramatic decrease in catch per unit effort (an indirect measure of fish abundance) over the past decades.

The declines observed in Koh Sralao's aquatic resources may be due to a number of different factors. Fishers have observed an increase in foreign fishing vessels in the nearshore area. Thai fishing vessels may be moving into Cambodian waters as a result of Thailand's fisheries reform (World Fishing & Aquaculture, 2016). Fishers also talk about the impacts of climate change on aquatic resources. Although the direct effects of climate change on fisheries in Koh Sralao are not yet clear, it seems that rains and the timing of the monsoon is less predictable, and storms may be more frequent. Ocean warming is also likely impacting fish migration routes and reproduction (Savo et al., 2017).

Sand dredging
In addition to the persistent decline in catch, sand dredging, which began in the Koh Sralao area in late 2007, has had an impact on the aquatic resources surrounding the Koh Sralao community (see photo above). The shorter-term impacts of this dredging are clear (Marschke, 2012):

- Fish habitat is being destroyed. Dredging deepens shallow channels, impacting fish and other aquatic habitat in the process.
- Fish migration routes are being disturbed, and the water is said to be more turbid.

- Boats have been dredging near the edge of the mangroves, partially damaging some trees and completely ripping out others

Community initiatives

Koh Sralao is a village with a history of community organisation around resource management (Marschke, 2012). This means that villagers have been able not only to organise formally but also use informal channels to express their concerns.

Sand dredging
Villagers have been concerned about sand dredging since it began in 2007, and have been involved in protests, public consultations and meetings with multiple actors, including the sand dredgers. At one point, the sand dredging came within eyesight of Koh Sralao, which mobilised villagers yet again. The Koh Sralao community has received support from NGOs, including an activist NGO that initiated an anti-sand mining campaign in 2015.

Mangrove conservation
The Koh Sralao community has worked together to safeguard their natural environment. They have become aware of the importance of conserving the mangrove forests that form a critical link to their livelihood. For example, annual mangrove replanting became a community tradition in the late 1990s. The area is known for its mangroves which span 23,750 hectares in a protected area and features an ecotourism site set up near the Peam Krasop community.

Livelihood diversification
Households have responded to marine resource degradation by shifting livelihood activities within and beyond the village, with regional factory wage work emerging as another diversification strategy. It is predominantly young women in Koh Sralao that go to work at the Koh Kong SEZ located near the provincial town, since SEZ factories mainly hire women between the ages of 18 to 25 (Narim & Paviour, 2016). However, there is no maternity leave for women, and it is difficult for them to return to the SEZ after the age of 28. Thus, while young women are gaining more opportunities beyond the

The sun sets on houses at Koh Sralao coastal fishing village in Cambodia.
Photo: Furqan Asif

fishing village, such gains are time-sensitive, and it is unclear how many young women will return to the village at another point in their lives.

Meanwhile, a small, but growing number of men in the village have moved out of fishing-based livelihoods by leaving the village and finding work, either in Koh Kong town or Phnom Penh the capital. Most of this work is in the informal economy, but is seen as less precarious than fishing. Young men may be less interested in fishing, as fishing cannot consistently provide for their material well-being (Asif, 2020). The long-term implications on the lives and livelihoods of villagers in Koh Sralao are unclear. What is certain, however, is that it will depend partly on the future state of marine resources in coastal Cambodia.

Practical outcomes

Sand dredging
One of the outcomes of the initial protests to the sand dredging was that the dredging activities moved to another area, out of sight of Koh Sralao. Even so, the community wanted the activity to stop altogether, since the negative impacts of the sand dredging continued to be felt. Community members worked with a local activist NGO, providing interviews to media and spearheading a social media campaign, to share the impacts of a decade of continuous sand mining on coastal livelihoods. In November 2016, the Ministry of Mines and Energy announced that they had halted sand dredging

operations in Koh Kong, with a total ban on coastal sand dredging for export emerging in mid-2017 (Lamb et al. 2019).

The ban on sand dredging is certainly welcome news to the villagers and for the conservation of the mangrove ecosystem. More broadly, this story not only highlights the challenges of natural resource-based livelihoods and the pressures that coastal communities face (shaped by socio-economic and political forces), but also the importance and impact of grassroots community activism for coastal ecological conservation.

Livelihood diversification

Local factory labour opportunities continue to provide a higher, more consistent income than would otherwise be the case for most young women in Koh Sralao. Women are sending remittances home, and for these households this is an additional source of income (even if time sensitive), all the more important given the challenge of small-scale fisheries livelihoods (Horlings & Marschke, 2020). The longer term implications of such wage work, in the sense of helping to sustain coastal livelihoods and villagers' well-being, remains to be seen.

References

Asif, F. (2019). 'From Sea to City: Migration and Social Well-Being in Coastal Cambodia'. In: A.G. Daniere and M. Garschagen (eds.), *Urban Climate Resilience in Southeast Asia, The Urban Book Series*, pp. 149–177. Cham, Switzerland: Springer. Available at: https://doi.org/10.1007/978-3-319-98968-6_8

Asif, F. (2020). *Coastal Cambodians on the Move: The Interplay of Migration, Social Wellbeing and Resilience In Three Fishing Communities* [Thesis, Université d'Ottawa/University of Ottawa]. Available at: http://ruor.uottawa.ca/handle/10393/40420

Horlings, J. and Marschke, M. (2020). 'Fishing, farming and factories: adaptive development in coastal Cambodia'. *Climate and Development* 12(6): 1–11. Available at: https://doi.org/10.1080/17565529.2019.1645637

Lamb, V., Marschke, M. and Rigg, J. (2019). 'Trading Sand, Undermining Lives: Omitted livelihoods in the global trade in sand'. *Annals of American Association of Geographers* 109(5): 1511–1528. Available at: https://doi.org/10.1080/24694452.2018.1541401

Marschke, M. (2012). *Life, Fish and Mangroves: Resource Governance in Coastal Cambodia*. Ottawa, Canada: University of Ottawa Press. Available at: https://doi.org/10.1017/s0030605312001731

_____ (2016). 'Exploring Rural Livelihoods Through the Lens of Coastal Fishers'. In: K. Brickell and S. Springer (eds.). *Handbook of Contemporary Cambodia*, Chapter 8, pp. 101–110. London, UK: Routledge. Available at: https://doi.org/10.4324/9781315736709

Narim, K. and Paviour, B. (2016). 'Sand Extraction in Koh Kong Province Halted, Ministry Says'. *The Cambodia Daily* [website], 17 November 2016. Available at: https://english.cambodiadaily.com/news/sand-extraction-koh-kong-province-halted-ministry-says-120637/

Savo, V., Morton, C., Lepofsky, D. (2017). 'Impacts of Climate Change for Coastal Fishers and Implications for Fisheries.' *Fish and Fisheries* 18(5): 877–889. Available at: https://doi.org/10.1111/faf.12212

World Fishing & Aquaculture (2016). 'No more free rides – as Thailand reforms fisheries'. *World Fishing & Aquaculture* [website], 11 October 2016. Available at: https://www.worldfishing.net/news101/industry-news/no-more-free-rides-as-thailand-reforms-fisheries

Acknowledgements

Les Village, Bali, Indonesia When conservation becomes a way of life

Humayra Secelia Muswar and Arif Satria

Figure 10 Map of Indonesia and location of Les Village

Key messages

- Les Village's marine environment was devastated by cyanide traditionally used for catching marine ornamental fish, leading to a decline in the local economy and fishers' livelihood.

- Local conservation began when eco-friendly approaches to catching fish were introduced to restore local marine resources.

- Local fishers easily adapted to these new community-based conservation approaches as they were in line with karma (Hindu-Bali's belief) and their way of life.

Community profile

Les Village is a fishing community located in the east of Buleleng Regency of Indonesia (Figure 10). Les Village consists of 25.57 km of coastline comprised of rock, gravel and sandy beaches. Locals mostly depend on fishing for their livelihood, as the land is very dry and not fertile enough for agriculture. However, residents can find other work as construction workers, merchants, businessmen or in the non-formal employment sectors of farming and animal husbandry. Tourism is not a significant livelihood source for locals.

Les Village fisheries consists of the seafood and the ornamental sectors. About 100 fishers are active in the seafood sector, while 50 fishers are active in the ornamental fisheries sector (with the village being a significant contributor to the local marine ornamental fish trade). There are four main groups of fishers in this village, one of which specialises in the ornamental fish sector and inadvertently caused damage to the local marine environment by using cyanide to catch fish.

Marine ornamental and seafood fishers have fundamental differences in the way they fish, such

Fishers in traditional boats
Photo: James Frey

as fishing gear, fishing time, fishing pattern, fishing location, the post-capture treatment of fish and their income scheme (Table 7). One important characteristic of the marine ornamental fishers of Les Village is their closeness to their religion. One of the most fundamental belief-systems for Hindu-Bali is 'karma', the idea of a balance of life: if Mother Nature is respected, nature will give the best of what it has, and vice versa. The belief system also plays a role in characterising the fishers, such as their knowledge, the role of women, the social structure and social position of the fishers (Satria, 2009).

Table 7 Key differences between seafood fishing and ornamental fish fishing

	SEAFOOD FISHING	ORNAMENTAL FISH FISHING
Fishing methods and gear	Bottom trawling; dredging; gillnetting; harpooning; midwater trawling; pole/trolling	Cyanide (old method); barrier net; scoop net; bucket decompression
Fishing time	Night-time	Early morning in clearer waters, making fish more visible
Fishing pattern	Fishers go out on a boat, and use their gear to catch the fish	Fishers dive to coral reef areas (ornamental fish habitat), then line fish with a barrier net. Fish are herded and trapped in the net. After, with a scoop net, fish are taken and put in a decompression bucket.
Location	Usually middle of the sea where pelagic fish congregate at night; use motor boat	Usually only a few kilometres from the beach, where the location is reached by swimming or small boat.
Post-capture treatment	Captured fish are put into cool storage	Release from decompression bucket to a plastic container; oxygen added for the fish; live fish is a must
Income scheme	Fisher's income depends on catch, a set selling price, and market demand	Income depends on catch and price determined by the middlemen.

Conservation and livelihood challenges

Initially, nets were used to catch ornamental fish in Les Village. However, an increasing demand in the 1980s prompted the fishers to look for ways to improve their catch. In 1985, the cyanide method of fishing was introduced to support marine ornamental fish market demand (Muswar & Satria, 2011; Pasaribu-Guzina, 2013; Sentosa, 2004). Fishers discovered that cyanide makes fish lethargic, thereby making them easier to catch (Muswar & Satria, 2011; Pasaribu-Guzina, 2013); fishers kept the cyanide in a bottle and sprayed the cyanide in the ornamental fish habitat (Sentosa, 2004).

Beginning in the 1990s and into the 2000s, marine ornamental fish began to be a lucrative commercial commodity. Fishers concentrated on fulfilling their household needs and generating income, while exploiting Mother Nature to satisfy marine ornamental fish markets (Bryant & Sinead, 2005). The use of cyanide made fish easier to catch; however, environmental deterioration began to be felt by fishers in the 2000s. The use of cyanide negatively impacted the local marine environment as live coral coverage fell below 10%, ornamental fish population decreased to below 20% and population of all species decreased to an estimated 10% of their 1986 population (Frey, 2012).

Coral reefs became bleached and only unique ornamental fish were left. Not being able to meet market demand, this development depleted fishers' income and devastated their social and economic life. Lack of government concern created a sense of abandonment among marine ornamental fishers. Fishers said that the government is only punishing them because of their use of cyanide, but gave no instructions on how to change their ways or preserve the environment. Three reasons, in particular, relate to the root causes of the destructive fishing methods:

1 **Fishers' knowledge.** Les Village fishers did not know of any other way to catch fish. Locals possessed limited information about fishing methods, especially since they have no senior high school or higher education. This concern was

most frequently raised by fishers. Using cyanide had become transmissible knowledge. Fishers faced a dilemma to survive and had to choose between catching fish with cyanide or not being able to eat at all. The use of cyanide eventually became unlawful and Les Village fishers were often detained for violation of the law against the use of cyanide to catch fish. Yet, the government offered no solution, without which fishers would continue to violate the law in order to support themselves and their families. The combination of lack of education and lack of guidance from the state thus established a livelihood dilemma for fishers.

2 **Market demand.** The ornamental fish trade is part of the global and international market, and whether they like it or not, local fishers are a part of a globalised market system. To maintain a livelihood, they must meet a demand that comes from first-world countries. The greater the market demand – in this case, via the middlemen – the more fish must be caught. Thus, Les Village fishers and the local environment are exploited and marginalised in order to meet the demand of more powerful countries and peoples (Bryant & Sinead, 1997).

3 **Lack of public and stakeholder awareness and involvement.** The marine ornamental fish trade is part of international trade, which involves stakeholders. This means that capitalist industrialisation brings constant pressures on individual firms (big or small) to maintain low costs (Mansfield, 2011). One of the main ways firms do this is by 'externalising' the costs of their impacts (including environmental, social and health) – in other words, finding a way to make someone else pay those costs. In fisheries, firms benefit from the environment – they profit from the fish – but they do not pay the full costs of the impact their fishing has on the local fisheries or the environment. In the case of Les Village, fishers were pressured to continue to use cyanide in order to meet market demand. Fishers were put in a difficult dilemma: wanting to conserve the environment when it began to degrade, but lacking the education to know the negative impacts of cyanide and, even worse, lacking support or knowledge about

solutions. However, fishers continued to fish as they needed to support their livelihood. Others would profit from their environment and take whatever they conserved if they did not (Bryant & Sinead, 2005; Mansfield, 2011).

Community initiatives

This situation continued for nearly 20 years. In the early 2000s, when reefs were already damaged and degradation reverberated, government still did not come to help; however, the NGO Yayasan Bahtera Nusantara (YBN) came and provided much needed support to the fishers. Originally engaging the fishers under the guise of a buyer, YBN provided fishers with training and new equipment for environmentally-friendly fishing, thus moving from cyanide to using nets and barriers only. The approach that the NGO helped to implement was particularly successful since it acknowledged the fishers' belief system, thus helping Les Village fishers transform from the destroyer to the guardian.

The value of environmentally-friendly fishing that was implemented brought back fishers' consciousness about the balance of life. They realised that using cyanide meant demolishing their own natural resources, since they suffered from the effects of using cyanide: diminished fish stocks, disappearing coral reefs and heavy debt. Thus, Les Village's ornamental fishing community worked with the NGO to restore their marine livelihood.

The initiative consisted of the following actions:

1   Establishment of a new marine ornamental fish group that committed to ecologically-friendly fishing practices (no cyanide), and community-based marine environmental management.

2   Creation of artificial reefs to enhance Les Village's marine diversity.

3   Design of a community-based no-take zone.

4   Improvement of the belief that 'karma' does exist, and that "if we treat our nature good, nature will give us good fish".

Artificial reef structures ready for installation on the reef.
Photo: James Frey

Around 2005, YBN worked with the Marine Aquarium Council (MAC) to legitimise the environment-friendly transformation of marine ornamental fish trade in Les Village. Not only fishers, but also the middlemen and exporters, were certified as eco-friendly actors. Although the certification expired in 2008, fishers continued to apply the sustainable eco-friendly fishing methods. Now, LINI (Indonesian Nature Foundations), an environmental NGO, works with Les Village fishers to continue this sustainable way.

Practical outcomes

The success of this conservation movement by Les Village's communities of marine aquarium fishers was a collective effort. Several factors and important actors were involved:

Leadership – The NGO's leadership was the most powerful tool for motivating this community to move from using cyanide to using environmentally friendly fishing practices.

Community Social Capital – The community has very high social capital and unity due to their inter-relatedness and common history. Together, they inadvertently destroyed their marine environment, suffered and are recovering their livelihood. Togetherness and trust is the biggest part of this community's social capital.

Fishers' Belief System – Their beliefs as Hindu-Bali teach them to put trust on 'karma'.

Support Networks – The village has an extensive support network with NGOs, researchers (from universities) and trade chain actors that buy and sell their eco-fish.

Timing – The conservation was done just in time. The NGO came in at a critical ecological time, when fishers were getting more confused and frustrated from suffering from their sinking livelihood and questioning what they were doing to their environment.

References

Bryant, R. and Bailey, S. (1997). *Third World Political Ecology*. New York, USA: Routledge.

Frey, J.B. (2012). *A community-based approach to sustainable ornamental fishing on coral reefs, Bali, Indonesia*. Master's thesis (Natural Resources Management). Natural Resources Institute, University of Manitoba, Winnipeg, Canada. Available at: https://umanitoba.ca/institutes/natural_resources/canadaresearchchair/thesis/James%20Frey%20Master's%20Thesis%20Dec%202012.pdf

Mansfield, B. (2011). "Modern" industrial fisheries and the crisis of overfishing. In: R. Peet, P. Robbins, M. Watts (eds.), *Global Political Ecology*, Chapter 4. London, UK: Routledge.

Muswar, H. and A. Satria. (2011). Impact of Fisheries Ecolabelling (Case Study: Les Village's Ornamental Fish Fisher). Sodality: Transdisciplinary Journal of Sociology, Communication, and Human Ecology, December 2011, pp. 273–296. Available at: https://doi.org/10.22500/sodality.v5i3.9693 (in Bahasa Indonesia).

Pasaribu-Guzina, S. (2013). *Assessment of an Environmentally-Friendly Method of Ornamental Fishing Associated with Revenues of Fishers In Tejakula Sub-District, Buleleng Region, Bali, Indonesia*. Master's thesis (Environmental and Management). School of Environmental and Sustainability, Royal Roads University, British Colombia, Canada. Available at: http://hdl.handle.net/10170/641

Satria, A. (2009). Fishers Political Ecology. Yogyakarta, Indonesia: LKis. ISBN: 9789791283885 (in Bahasa Indonesia).

Sentosa, P. (2004). *Sustainable Marine Ornamental Fish Business: A Case Study on How to Catch Cyanide to Non-Cyanide Ornamental Fish in Tejakula District, Regency, Bali)*. Master's thesis (Environmental Science Studies). Graduate Program, University of Indonesia, Jakarta, Indonesia. Available at: http://lib.ui.ac.id/bo/uibo/detail.jsp?id=73982&lokasi=lokal (in Bahasa Indonesia).

Acknowledgements

Haruku village, Maluku Province, Indonesia
Conservation embedded in tradition and culture

Ahmad Mony and Arif Satria

Key messages

- Haruku village is a coastal community that uses *sasi laut*, a local knowledge and culture-based practice of coastal resource conservation.

- *Sasi laut* was weakened in the 1980s and the early part of the 2000s, due to a lack of government concern about destructive fishing activities as well as the Maluku conflict in 1999–2002. Subsequently, starting in early 2004, through the cooperation of multiple stakeholders, the *sasi laut* system has strengthened, helping local fishing communities to consider global issues related to conservation practices

- Cooperation of multiple parties at multiple levels is the best approach for sustainable *sasi laut* practices.

Community profile

Haruku village is located in the island of the same name, in Maluku Province, Indonesia (Figure 11). Most of the island is hilly terrain and nearly all of the population is along the coast. The island consists of four Muslim villages and seven Christian villages (Central Bureau of Statistics of Central Maluku Regency, 2015). The people of Haruku Island depend on the plantation sector as their main livelihood. Marine resources are not yet used as the main support system for livelihoods due to limitations on local utilisation of fishery commodities.

In the island, an Indigenous practice of coastal resource protection, called *sasi laut*, has been used for hundreds of years. *Sasi laut* is a form of traditional institution regulating the management of coastal resources based on the knowledge, norms and value systems of the Indigenous people of Maluku. This system regulates the rights and obligations of the Indigenous peoples in utilising and protecting coastal resources. As defined by Harkes and Novaczek (2000, pp. 1–3), *sasi laut* "…prohibits the use of destructive and intensive gear (poisonous plants and chemicals, explosives, small mesh lift-nets), but also defines seasonal rules of entry, harvest and activities allowed in specific parts of the sea. The regulations are guarded and enforced by an institution known as the *kewang*, which functions as a local police force. Their legitimacy, as well as that of the sasi institution itself, is based on *adat*, or customary law".

Sasi laut has been implemented by the Harukunese for over 400 years. This practice is related to the establishment of Haruku Village and their motivation to save lompa fish (*Thrissima balema*), a sacred fish species related to the history of the founding of the village (Mony, 2015).

Climate change in these coastal areas, which is characterised by ecological and seasonal changes, has provided an understanding for Indigenous peoples about the importance of maintaining *sasi laut* as a local institution to protect coastal areas. Maintaining *sasi laut*, amidst the impacts of climate change and social transformation, will have an important impact on the preservation of coastal and

Harvesting lompa fish
Photo: Jacky Manuputty

inland resources, the preservation of culture, and ensuring the availability of fish in the waters.

Conservation and livelihood challenges

Recently, the practice of *sasi laut* has weakened due to external and internal pressures of the actors involved. The external factors that threatened the existence of the legal practice of *sasi laut* were modernisation and commercialisation, which resulted in the erosion of traditional values (Harkes & Novaczek, 2001). Within the Haruku society, *sasi laut* practices were faced with challenges, such as internal political conflicts, competition in the local economy, regeneration of kewang and the power of outsiders who did not consider the social and cultural conditions of the Indigenous community. In addition, locals spoke of such factors as access to fishery commodity markets, capital limitation and lack of human resources as the main constraints to switch the orientation of their livelihood income from plantation to fishery systems (i.e. fishing/aquaculture).

The actors involved in the development of *sasi laut* had three main interests, economic, ecological and cultural. The economic interests were normally represented by communities, businesses and local governments. The ecological interests were represented by the traditional leaders, NGOs, universities, donor agencies, environmentalists and researchers. Cultural interests were represented by the Indigenous communities, universities and government. This mixture of interests created

uncertainty about the implementation of *sasi laut*, as *kewang* were unsure of which motivations to follow, thus weakening *sasi laut* practices.

Community initiatives

The Indigenous community of Haruku, which had been more moderate and adaptive to the issues of coastal resource management, drew on cooperation among actors to further develop *sasi laut*. Advocacy of relationships with outside parties aroused a new awareness to expand the scope of *sasi laut* and the adaptation of new values in *sasi laut* gained the support of the community. Furthermore, the people were actively involved in such programmes as a mangrove nursery and rehabilitation of mangrove areas in the estuary of the Learisa Kayeli River, one of the lompa fish habitats. The importance of mangrove rehabilitation had been increasingly recognised after the occurrence of coastal erosion in the last few years, which directly threatens human settlements and other public infrastructure.

Practical outcomes

Due to both external and internal pressures, changes in the political, governance, natural resources and societal livelihood systems have affected the orientation of the *sasi laut* management system in Maluku, resulting in some positive and negative changes:

First, there has been an increasing awareness of efforts to protect coastal areas and the natural resources therein. This awareness encouraged the emergence of the *kewang*, assisted by outside parties, such as NGOs and donor agencies, to widen the area protection of the *sasi laut* system on other resources.

Second, the emergence of gender awareness has encouraged women's involvement in the *sasi laut* institution. The involvement of women in the institution was based on the consideration that one of the dimensions of Indigenous *sasi* is female, providing a certain space for the presence of women in the sasi institution pertaining to the processes of law enforcement against woman offenders on *sasi*.

Third, as a social institution, sasi is vulnerable to family economic problems during its implementation. To overcome this problem, *kewang* have been provided a business unit in the form of economic management of marine tourism. Kewang have some guest houses with some units rented to researchers and tourists (local and foreign) visiting Haruku Island, thereby providing additional income locally.

Fourth, there has been a decline in involvement in *kewang* that is needed to perform surveillance on resources. Some NGOs and donors have noticed problems of *kewang* regeneration through education and training.

Fifth, the rise of awareness of *kewang,* and their experience in dealing with outside parties (NGOs, universities and donors), has encouraged kewang empowerment. *Kewang* of Negeri Haruku have established the Foundation of Haru-Ukui Kalesang to empower *kewang* in Maluku and coordinate implementation of inter-*kewang* of *sasi laut* in Haruku Island. Through this foundation, the *kewang* in Haruku Island has facilitated some kewang leaders from other villages to attend national seminars on coastal conservation and empowerment of Indigenous people.

Recently, *sasi laut* has been developed by expanding the objects of conservation, including mangrove ecosystems, the *Gosong* bird (*Eulipoa wallacei,*

Sasi Laut Festival of Haruku Village
Photo: Paul Noris

or Moloccan scrubfowl), turtles and other coastal resources. In addition, *sasi laut i*s supporting marine tourism through a *sasi laut* festival in Haruku Village. Gender discourse has also been adopted through the representation of women in the local police corps, *kewang*. This was facilitated through the efforts made by such external parties as NGOs, donor agencies and universities.

In terms of legislation, the practice of local wisdom in Indonesia, such as *sasi laut*, has been recognised by the state through various laws and regulations. Political and natural resource governance changes, coupled with the strengthening of marine conservation discourse in Indonesia, make *sasi laut* more effective for coastal area protection and resources therein.

In Maluku, the strengthening of *sasi laut* practices is able to address the challenges of sustainability in the local system, particularly in implementing traditional ecological knowledge (TEK), amid global efforts to develop marine conservation networks. Therefore, the authority of *sasi laut* management must be responsive to the dynamics of the political system, economy, law, governance, science and technology. In conclusion, the transformation of *sasi laut* should be aimed at strengthening the capacity of human and institutional resources that are adaptive and responsive to external changes.

References

Central Bureau of Statistics of Central Maluku Regency (2015). *Haruku Island in Figures 2015*. Available at: https://malukutengahkab.bps.go.id/publication/2015/11/05/c7bf99c2cd891d6c31c9263c/kecamatan-pulau-haruku-dalam-angka-2015.html

Harkes, I., and Novaczek, I. (2000). 'Institutional resilience of sasi laut, a fisheries management system in Indonesia', conference paper delivered at the Constituting the Commons: Crafting Sustainable Commons in the New Millennium, Eighth Biennial Conference of the International Association for the Study of Common Property, Bloomington, Indiana, USA, 31 May – 4 June 2000. Available at: http://dlc.dlib.indiana.edu/dlc/handle/10535/2314

_____ (2001). *An Institutional Analysis of Sasi Laut, A Fisheries Management System in Indonesia*. Available at: https://www.researchgate.net/publication/42763079_Institutional_Resilience_of_Sasi_Laut_a_Fisheries_Management_System_in_Indonesia

Mony, A. (2015). *Political Ecology on Coastal Resources Management: Case Study of Power Relations on Sasi Laut Management in Haruku Island* (Ekologi Politik Pengelolaan Sumberdaya Pesisir: Studi Kasus Relasi Kuasa Pengelolaan Sasi Laut di Pulau Haruku). Master's thesis. IPB University, Bogor, Indonesia.

Acknowledgements

São Luiz do Paraitinga and Catuçaba, Brazil From land degradation and disaster to conservation and development

Camila A. Islas, Alice R. de Moraes, Juliana S. Farinaci and Cristiana S. Seixas

Figure 12 Map of Brazil and location of São Luiz do Paraitinga

Key messages

- Severe land degradation and environmental disasters can act as triggers to new community conservation and development initiatives and as stimulus to existing ones.

- Bridging organisations can foster community initiatives through projects addressing environmental conservation and restoration in parallel to local capacity building and community development.

- Cultural identity can play a central role in engaging communities in projects of nature conservation.

Community profile

São Luiz do Paraitinga (hereafter São Luiz) is a municipality with about 10,000 inhabitants, located in Eastern São Paulo State of Brazil, near the Atlantic coast (Figure 12). The municipality is situated within the Paraíba Valley, which links the two largest metropolitan areas in Brazil (São Paulo and Rio de Janeiro). Out of the ~730 km² of the municipality's area, 10% are encompassed by Serra do Mar State Park, a protected area, and 13% are in its buffer zone. The main land uses/cover are pasture (53%) and fragmented forests (37%), while cattle breeding for dairy, forestry and agriculture are the main economic activities (Akarui, 2017). The municipality is also embedded in the Atlantic Forest biome – a hotspot for biodiversity conservation, i.e. one of the highly threatened biomes in the world (Myers, 2000).

The landscape of São Luiz has been shaped by specific material and immaterial cultural features that were strongly influenced by coffee plantations from the early 20th century and by the *Caipira* way of life, a local designation to a rural livelihood which involves typical food, music, tales, dances and festivities (see photo).

The city's architectural ensemble is the largest historical collection of the State's architectural heritage, and its population proudly keeps alive several displays of immaterial culture (Moraes, 2019). The local economy currently depends on public services, and the Human Development Index (HDI = 0.690) is among the lowest in the State's municipalities. In this context, cultural tourism and ecotourism are promising alternatives for economic development.

Rural communities in Brazil are important SES, specifically in south-eastern states such as São Paulo, where landscapes are highly fragmented and urbanised. Landscapes there sometimes have patches of native vegetation that are especially important to wild animals, serving as habitat and 'stepping-stones', which generate various ecosystem services and are also home to human communities and their livelihoods (Moraes, 2019). The vast majority of rural properties (96%) in the municipality of São Luiz are owned by smallholders (Akarui, 2017).

Traditional dance presentation at the central square, in front of the main church, during the festivity of the Holy Spirit (2016).
Photo: A. Moraes

In this context lies Catuçaba, a rural district of São Luiz comprising a village with around 1,000 inhabitants and its surrounding rural neighbourhoods. Most inhabitants make their living from small-scale animal husbandry and other smallholding activities (Moraes, 2019).

Until a few decades ago, the village was partially isolated from the urban centre due to poor road access. However, the road connecting the village to downtown was paved by the year 2000, facilitating outsiders' access and products transportation, and improving the access of villagers and rural inhabitants to infrastructure, education and health. Tourism-related activities have been modestly flourishing in the territory, supported by its beautiful landscape, pleasant climate and historical farms.

Conservation and livelihood challenges

Land degradation is longstanding in the region. Agriculture has been practiced since the settlement of the first colonisers in the late 17th century, in spite of the hilly landscape and low nutrient availability and permeability of the soil (Akarui, 2017). Economic cycles (cotton, coffee and cattle), along with poor soil management techniques, contributed to land degradation, impoverishing the soil, and more recently covering the land with *Brachiaria*, an invasive exotic grass that poorly feeds the cattle and worsens soil permeability. As a result, cattle productivity has declined and many landowners fell back on other activities to complete their income.

Meanwhile, due to the promises of better job and education opportunities in urban centres, rural out-migration hampered the availability of rural workers and lowered social cohesion. Currently, land degradation in such social context threatens most of the traditional livelihoods.

On 1st January 2010, São Luiz suffered from a flood of great magnitude, when the river crossing the downtown area raised over 11 metres above its regular level in a matter of hours, largely damaging the historical buildings and affecting the whole population, both urban and rural. Fortunately, there were no fatalities. Other than the high precipitation registered in end-2009 and early 2010, the flood was caused by factors linked to land degradation in rural areas, such as soil compaction in poorly managed pastures, fires commonly used to clear land, scarcity of forests near watercourses and human occupation of floodplains.

Community initiatives[12]

In the face of the disaster's intensity and tremendous material losses, the population of São Luiz showed a remarkable capacity to self-organise in order to cope with the emergency situation and, later, to rebuild and restore the functioning of the city. Since the floods, the territory as a whole has been targeted by diverse projects focusing on forest restoration, agro-ecological production and capacity building.

The 2010 disaster stimulated new and ongoing community initiatives, mostly with the help of local and regional NGOs and government organisations. During the post-disaster reorganisation phase, the community actively participated in decisions regarding the reconstruction of historical buildings and other issues. In addition to engineering work conducted at the government's initiative, most post-disaster initiatives focused on keeping the vibrancy of local cultural manifestations.

The community also showed a remarkable sense of place and attachment to both São Luiz, similarly to Catuçaba, and its surrounding area (see photo
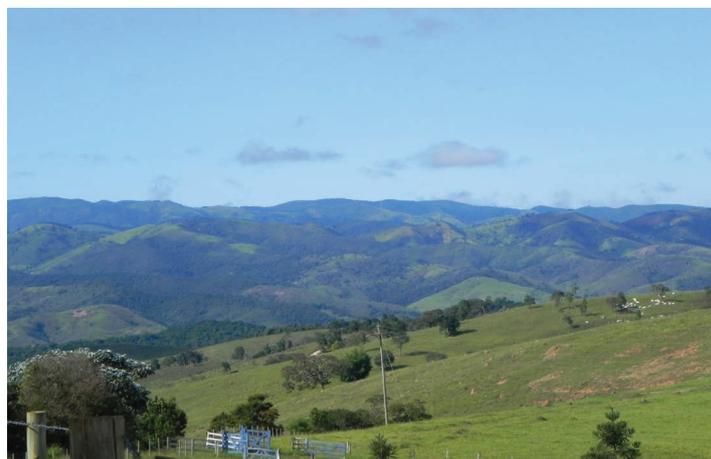
The scenic landscape around Catuçaba district: degraded pastures and patches of biodiversity-rich Atlantic forest covering its hills and valleys
Photo: C. Islas

above). The tragedy seems to have reinforced a sense of place and local people's capacity to cope and regain their community life with their own hands, and at the same time acknowledging and being grateful for all the solidarity and help they received from external people and institutions.

One of the community initiatives working to improve conservation and livelihoods was the *Comunidade da Vila* (Village Community). In 2012, the Learning Communities initiative began in Catuçaba. The main goal of the project was to promote an environment for reflection about nature conservation and local development, and to facilitate the planning of collective actions (Araujo et al., 2017; Moraes, 2019). Together with local people, the initiative planned and organised several cultural events and community actions over three years (Araujo et al., 2017). Although the project ended in 2015, the community continued to meet until 2017, focusing on a street market with local products, tourism-related activities and festivities (Moraes, 2019).

12 The data and analyses on the social-ecological system of São Luiz and Catuçaba refer to the period 2012-2017. The authors acknowledge that changes have occurred in the system since then. Although they are not analysed here, we have added some information about the current situation, based on non-systematic observation.

A local NGO, Akarui,[13] had been developing projects for nature conservation integrated with socio-economic development in the region since 2003. After the 2010 flood, their prominence increased as Akarui members' attachment to and knowledge about the territory, in addition to their technical expertise, led efforts to a sustainable development of rural areas of the municipality. Akarui has carried out projects regarding socio-environmental characterisation, forest restoration, agro-ecological transition, pasture management and improvement of farmers' income. The NGO is still working in the territory, currently expanding their initiatives to encompass environmental education and food security and sovereignty.

After the extreme events of 2010 (flood) and 2013/2014 (severe drought), more community members got interested in taking part in restoration projects, and a growing number are willing to adopt agro-ecological principles to their production chain. An Agenda 21 plan, built through participatory methods for the watershed, including guidelines for its sustainable development, is a featured product of Akarui. The NGO acknowledges rural communities as their main partners (Akarui, 2017).

Finally, another initiative named *Rede para o Desenvolvimento Sustentável do Alto Paraíba* (Upper Paraíba River Sustainable Development Network), or REDESUAPA, began their work after the 2010 floods. The network encompasses diverse stakeholders, including local leaders, local and state government, local and regional NGOs and researchers, who met voluntarily in the municipality. In addition to project development, REDESUAPA created synergies among ongoing efforts and aimed at influencing public policy based on a systemic view of the territory, and promoting ecological restoration, sustainable farming and community-based tourism. For instance, in 2016, REDESUAPA wrote an open letter addressed to the candidates running for Mayor asking for their commitment to priority guidelines for urban and rural sustainable development in the municipality. The network played a key role in the efforts to bring investments of a big project to the region, which is

funded by the Global Environment Facility (GEF). The **Recovery and protection of climate and biodiversity services in the Paraíba do Sul Basin of the Atlantic Forest of Brazil** project is based on Payments for Environmental Services (PES) and other incentives for sustainable land management and conservation in private lands.[14] The members of REDESUAPA are still in touch with each other, but the network itself is on 'standby mode'. However, the synergies created by REDESUAPA are reflected in a number of other initiatives concerning local development, conservation and ecological restoration.

Practical outcomes

The development of initiatives is neither easy nor fast, but they have certainly been flourishing and creating arenas for community learning, empowerment and development in São Luiz do Paraitinga (including Catuçaba). Although the 2010 flood was an important trigger to various initiatives, it is still unclear how successful they will be in terms of self-maintenance and mitigating the risk of floods in the future.

These bottom-up initiatives have valued rural livelihoods and fostered opportunities for people to remain in rural areas. Inhabitants have been self-organising to strengthen their *Caipira* identity, preserve local traditions (e.g. festivities and foods) and promote local development, with an overall understanding that their good quality of life depends on nature conservation (Moraes, 2019). Small, low-cost initiatives triggered improvements in the community capacity to self-organise and act collectively for a common goal (Moraes and Islas, 2020), although leadership and broader participation of community members in such initiatives remain a challenge.

Bridging organisations, such as NGOs and university teams, play a crucial role in linking local stakeholders with one another and with outside institutions (i.e. State Environmental authorities and funding agencies), facilitating learning opportunities, fundraising and providing access to technical advisory (Araujo et al., 2017). In the course of creating

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13   For further information, please visit: www.akarui.org.br (in Portuguese).
14   For further information, please visit the website of the project: https://www.infraestruturameioambiente.sp.gov.br/conexao/

environments where diverse local and outside stakeholders can interact and collaborate, the initiatives have generated a feedback loop, which is attracting more and more initiatives (Moraes, 2019).

Until 2017, several stakeholders were joining efforts to work synergistically, for instance through REDESUAPA, to positively transform the region's landscape at the watershed level. The efforts were benefiting from both bottom-up and top-down initiatives, taking into account both local knowledge and technical/scientific expertise, and involving stakeholders with different levels of political power. Above all, the efforts involved a diverse array of individuals who believe in a more sustainable and just society, and struggle year after year to accomplish their vision.

In the face of socio-ecological change over the last decade, various community initiatives towards conservation and social development have emerged in São Luiz do Paraitinga (Moraes, 2019; Moraes & Islas, 2020). Many tourism-related activities have been developing, especially those regarding ecotourism (e.g. farm hotels and rafting) and cultural tourism (e.g. religious, art and local food festivities). More recently, other community initiatives were established as local markets of agro-ecological products and craft fairs. After the 2010 floods, the municipality drew the attention of many governmental and non-governmental organisations (NGOs) favouring the emergence of new environmental and social initiatives. The success of these initiatives has depended on population engagement and participation, as well as aligning to local demands and inherent dynamics of the local SES. The question ahead may be if and how these initiatives will thrive (or perish) in the long term, and which factors will determine their course.

References

Araujo, L.G., Dias, A.C.E., Prado, D.S., De Freitas, R.R., Seixas, C.S. (eds.) (2017). *Caiçaras e caipiras: uma prosa sobre natureza, desenvolvimento e cultura* (Caiçaras and caipiras: a prose on nature, development and culture). Campinas, São Paolo, Brasil: Grupo de Pesquisa em Conservação e Gestão de Recursos Naturais de Uso Comum (CGCommons), Núcleo de Estudos e Pesquisas Ambientais (NEPAM), Universidade Estadual de Campinas (UNICAMP). Available at: https://30c07274-acac-4851-aca1-731321759162.filesusr.com/ugd/b6df3d_b0a9d63e5d bf4b83b117aba0d4ad4ab0.pdf

Akarui (2017). *Subsídios para um plano de restauração florestal da bacia do Chapéu, São Luiz do Paraitinga, SP* (Recommendations for a forest restoration plan for the Chapéu river basin. São Luiz do Paraitinga, SP). São Luiz do Paraitinga, Akarui. Available at: https://6a9df363-4618-4222-848e-c4ccd9c9a57f.filesusr.com/ugd/596978_ c7d96ee7ec924ff393dfff32f68bee64.pdf

Moraes, A.R. (2019). 'Ecosystem services in a hilly rural landscape: contributions for resilience-based management'. Doctoral thesis (Ecology). University of Campinas, Brazil. Available at: http://repositorio.unicamp.br/jspui/handle/ REPOSIP/338484

Moraes, A.R., Islas, C.A. (2020). 'Community responses to historical land degradation: Lessons from São Luiz do Paraitinga, Brazil'. In: M. Arce-Ibarra, M.R.B. Vázquez, E.B. Baltazar and L.G. Araujo (eds.), *Socio-environmental regimes and local visions. Transdisciplinary experiences from Latin America*, pp. 363–379. Cham, Switzerland: Springer.

Myers, N., Mittermeier, R.A., Mittermeier, C.G., da Fonseca, G.A.B., and Kent, J. (2000). 'Biodiversity hotspots for conservation priorities'. *Nature* 403: 854–858. Available at: https://doi.org/10.1038/35002501

Acknowledgements

Vila dos Pescadores, Cubatão, state of São Paulo, Brazil Community well-being, environmental challenges and livelihoods in a Brazilian mangrove shantytown

Cintia Nascimento

Figure 13 Map of Brazil and location of Vila dos Pescadores

Key messages

- Many members of the community of Vila dos Pescadores rely on artisanal fishing for their livelihoods.

- The industrial activity in the Santos estuary has led to the pollution of mangroves, affecting fish stocks and impacting human and ecological well-being, notably in the community of Vila dos Pescadores;

- Although the community works with government institutions, private partners and local NGOs to improve their community and restore the mangroves, further dialogue with decision makers is needed.

Community profile

The community of Vila dos Pescadores (Figure 13) is an urban slum located in a mangrove area, in the city of Cubatão, Brazil. This community is located in the Santos Estuary, where many of the people living in the community use the mangroves for artisanal fishing, which is a large source of income for people living in the area. For many populations in the mangrove slums of Cubatão, artisanal scale fishing contributes to their food security.

Conservation and livelihood challenges

As an extremely impoverished mangrove-based region, mangrove conservation is vital to the livelihood of Vila dos Pescadores community. The mangrove ecosystem serves to secure the land, preventing erosion while stabilising the coast, while the roots of mangroves act as filters in retaining sediment. Moreover, mangroves play an important role as an exporter of organic matter to the estuary, contributing to primary productivity in the coastal zone. Many aquatic and terrestrial species with ecological and economic value, such as fish and shellfish, are found in mangroves where conditions are ideal for breeding, nursery and shelter (Gillam & Charles, 2019).

The community of Vila dos Pescadores also suffers from environmental vulnerability by being located in an industrial hub in the Santos Estuary, the largest port in Latin America. Garbage accumulates in the mangroves of the community. The pollution affects fishing by trash accumulation in spawning sites for fish and shellfish, and destruction of fish nets.

Similarly, environmental disasters in the estuary harm fishers' livelihoods by causing fish mortality and environmental pollution, further affecting the community's and fishers' well-being. On 2 April 2015, an environmental disaster occurred in the Santos Estuary when a fire occurred in the Ultracargo fuel company involving six fuel tanks. Consequently, fishers at Vila dos Pescadores were temporarily unable to fish, impacting their main source of income and livelihood as well as their well-being, as fishing is part of their identity (see photo).

Fisher in the Santos Estuary
Photo: Cintia Nascimento

Community initiatives

The Vila dos Pescadores community leader José Arnaldo dos Santos (Vadinho) works extensively with government agencies, the private sector and NGOs to improve the well-being and living conditions of community members. Vadinho is a fisher and also the president of the Community Association of Vila dos Pescadores.

The community association has benefitted from a partnership with the *Instituto de Pesca* (Fisheries Institute of São Paulo state, located in the neighbouring city of Santos), which gives the community important support about fishers' rights and environmental education (Gillam & Charles, 2018). The institute undertakes significant research on coastal resource management in the area.

Aiming to improve the well-being of the community, the community leader Vadinho also works with local private partners and NGOs in the area such as Teto (roof) (GEF, n.d.). Teto's community work is focused on the most excluded slums, with its main engine being the joint action of its residents and volunteers who work to generate concrete solutions to social problems considered a priority: poverty. Among other NGOs, Teto's staff and volunteers worked with Vadinho, aiming for the mobilisation, and self-management and support networks of Vila dos Pescadores community members. The main objective is for the community to achieve their basic rights, through the regularisation of community members' property, installation or settlement of basic services, construction of permanent housing

and improvement of community infrastructure (GEF, n.d.). Considering that there are a large number of people living in shacks in the community of Vila dos Pescadores, this is an important step in improving the lives of fishers and other community members.

One of the partnership's projects aims to assess sustainability through quality of life with fishers in the Santos Estuary and the southern coast of São Paulo state.

Practical outcomes

Residents of Vila dos Pescadores community highlighted the need for assessing the well-being of fishers and the community in general, their livelihoods and conservation challenges, and the dialogue between the community and the government. The analysis of fishers' well-being is important at the policy level to allow interventions, such as selective urbanisation, involvement of fishers in conservation initiatives and implementation of racial consciousness projects in the community.

Conservation measures are needed for the long term, but with the economic pressure weighing on the Santos Estuary as the largest port in Latin America, often fishers are not a political priority for any of the three government levels. The existing social capital among community members, with key leadership from Vadinho, is a first step in fighting for fishers' rights and conservation of mangrove areas of Vila dos Pescadores.

Following the Ultracargo disaster in April 2015, fishers and community members had a 'wakeup call' to fight for their rights. Women and fishers want to actively participate in conservation actions in the community. For example, fisher Helena Barros held women's and fishers' meetings at her house after the disaster. Many women in the community reunited again to discuss fisheries and livelihood issues.

The women were friends during their adolescence, when Helena Barros organised (in her house) craft courses for 35 teenage girls in the 1990s. The girls learned how to make hand-painted dishcloths for sale to improve food security in the community. The

Fisher and her son in the Santos Estuary
Photo: Cintia Nascimento

women also shared pictures of a state government-funded mangrove reforestation project in 1992 that involved fishers at Vila dos Pescadores, and discussed the need for more mangrove conservation projects involving women and fishers in the community.

The relational well-being in the community is relevant as women in the community, wives of fishers and/or fishers themselves have reunited to fight for their rights after the Ultracargo disaster. It proved to be a starting point in Vila dos Pescadores for their fishing, environmental and conservation rights. The environmental disaster led community members to get involved with the Fisheries Institute and local NGOs. Locals are now more engaged as members host meetings and post pictures related to fisheries issues and mangrove conservation.

Fishers take pride in their profession and profound environmental knowledge of the mangrove areas of Cubatão, in the Santos Estuary. Once highly influential stakeholders, such as environmental NGOs and government agencies, give their support to fishers and community members, conservation efforts have a great potential for expansion and improving food security in this impoverished community. With respect to Vila dos Pescadores community, it has an invaluable pool of social capital and local environmental knowledge that can be channelled to conservation projects. Recently developed linkages between universities, municipal and state government agencies, NGOs and the community has led to a positive impact on the

implementation of conservation initiatives in the community.

Some of the possible solutions to the problems of environmental degradation in Cubatão are: investing in public policies for environmental education in slums and the industrial hub; empowering communities in mangrove conservation projects; and intensification of dialogue on environmental and sustainable development issues among government, business and civil society. Although dialogue is improving, conversations between the community and external entities need to continue, and ensure that the message of conservation reaches the ears of policy makers and decision makers.

References

Gillam, C. and Charles, A. (2018). Fishers in a Brazilian Shantytown: Relational wellbeing supports recovery from environmental disaster. *Marine Policy* 89: 77–89. Available at: https://doi.org/10.1016/j.marpol.2017.12.008

Gillam, C. and Charles, A. (2019). Community wellbeing: The impacts of inequality, racism and environment on a Brazilian coastal slum. *World Development Perspectives* 13: 18–24. Available at: https://www.sciencedirect.com/science/article/pii/S2452292917300620

Gillam, C.F. (2016). 'Effects of Social and Environmental Inequalities on the Wellbeing of a Slum Community: The case of Vila dos Pescadores in Southeast Brazil'. Master's thesis (International Development Studies). Saint Mary's University, Halifax, Nova Scotia, Canada. Available at: https://doi.org/10.1016/j.wdp.2019.02.006

Global Environment Facility (GEF) *UNDP* [website]. Available at: https://www.thegef.org/project/effective-conservation-and-sustainable-use-mangrove-ecosystems-brazil

UOL (2013). *Map of Cubatao*. Prefeita e vice de Cubatão (SP) têm mandatos cassados, mas seguem nos cargos. Available at: https://noticias.uol.com.br/politica/ultimas-noticias/2013/05/24/prefeita-e-vice-de-cubatao-sp-tem-mandatos-cassados-mas-seguem-nos-cargos.htm

Acknowledgements

Punta Allen, Quintana Roo, Mexico
Community-based ecosystem conservation – The spiny lobster fishery

Juan Carlos Seijo and Maren Headley

Figure 14 Map of Mexico and location of Punta Allen

Key messages

■ Through a combination of community-based co-management and territorial user rights, the Vigía Chico Cooperative in Punta Allen has had great success in supporting resource conservation and management, and providing a stable livelihood for fishers and their community, in part through fishery harvest strategies used by small-scale fishers to help maintain stable profits.

■ Fishers are building their understanding of the environmental and biological factors which affect the abundance, spatial availability of the spiny lobster resource and fishery profitability, and are exchanging knowledge about the possible effects of climate change and measures that can be taken by the community for adaptation and resilience.

Community profile

The Punta Allen community is located at the tip of a narrow peninsula (Figure 14), and is estimated to be less than one metre above sea level, with a population of around 600 persons. The major economic activities are the spiny lobster (*Panulirus argus*) fishery and eco-tourism. The Vigía Chico Cooperative runs this fishery, which operates in Ascensión Bay, located in the Sian Ka'an UNESCO Biosphere Reserve (Miller, 1989; Orensanz & Seijo, 2013; Seijo, 1993; Sosa-Cordero et al., 2008).

The bay covers an area of 850 km^2 and includes a variety of habitats, such as mangroves, corals, sponges, seagrass and macro-algae. For fishing and management purposes, the bay has been divided up by the fishers into individual fishing grounds, locally known as '***campos***', numbering 115 (Orensanz & Seijo, 2013).

In each 'campo', fishers deploy artificial shelters, from which spiny lobsters are harvested, by free diving using a small hand-held net, which allows females with eggs and undersized individuals to be replaced (see photo above). There are 41 'campo' owners, and each owner has exclusive fishing rights within their fishing ground. These rights are supported by internal working rules of their cooperative and respected amongst the fishers. The individual fishing grounds where artificial shelters have been introduced are located in 25 major fishing areas, which are characterised by different habitat and bottom types, and environmental parameters such as salinity and temperature.

The fishers have many incentives for a co-management approach, including high lobster catches, high prices and the cohesive group structure of the cooperative. Co-management has helped the fishery to develop in a sustainable manner such that in 2012, it received Marine Stewardship Council Certification. Most of the rules and regulations are set by the fishers themselves. Although the government has set regulations, the fishers support the co-management approach and there is good cooperation between the government and the fishers.

Hand-held net used to capture spiny lobsters
Photo: Maren Headley

Conservation and livelihood challenges

Lobster stocks are a valuable resource to many fishing communities worldwide, and daily changes in catch rates and profits make it difficult for fishers to make the best decisions throughout the fishing season. Factors which can affect the abundance of the spiny lobster include habitat quality, reproduction, and environmental conditions such as marine currents, hurricanes and climate change. In addition to the complexity of the fishery, the spiny lobster has a five-stage life cycle consisting of: (i) adults; (ii) eggs; (iii) larvae; (iv) post-larvae and (v) juveniles – with each stage occupying different habitats (Lipcius & Eggleston, 2000). Larvae develop over an estimated period of six to eight months in the ocean, drifting with the currents and forming connections among wider Caribbean spiny lobster populations. Regions with populations which produce their own larvae (sources), and others which receive more larvae than they produce (sinks), have been identified (Kough et al, 2013).

In many cases, these uncertainties lead to resource over-harvesting. These types of populations are known as meta-populations and require resource management at the local, national and international levels. It is therefore important that fishers and coastal communities have a good understanding of these factors.

Community initiatives

Being situated in a Biosphere Reserve, the Vigía Chico Cooperative has a long history of learning about their local ecosystem and engaging in conservation initiatives, through partnerships with research institutions and universities such as the University of Marista-Mérida. This has helped the community to build knowledge about:

- factors affecting the productivity and profitability of the fishery and its management implications;

- environmental and biological factors which affect the abundance of the spiny lobster resource;

- possible effects of climate change on the community and fishery, and measures that can be undertaken for adaptation and resilience; and

- relationships among catches of spiny lobster, density of artificial shelters, profitability and fishing area.

Further studies will help the fishers understand the relationship among catches of spiny lobster, density of artificial shelters and profitability in the various fishing areas, and how they can adapt to varying resource abundance and profitability throughout the fishing seasons.

Practical outcomes

Research partnerships have led to an understanding in the fishing community of seasonal and spatial differences in the catches and profitability within the fishing areas. These differences were attributed to the following factors: i) how the lobster is distributed, over space and time, across the Bay, and how its abundance changes; ii) the distance of the fishing area from the port and its location in relation to the mouth of the bay; iii) the density of artificial shelters; and iv) the fishing strategies, such as the choice of fishing intensity (number of artificial shelters harvested per trip) and trip frequency, according to resource abundance, to maintain stable profits throughout the season.

Recently constructed artificial shelters on the beach
Photo: Maren Headley

In terms of the state of the fishery itself, transparent and strong leadership has resulted in a unified effort to conserve the spiny lobsters and ensure a sustainable fishery. The rights-based system has eliminated the race to fish since each fisher has exclusive access to lobsters in their fishing ground. This has also allowed fishers to develop a unique harvesting method highly suitable to the area and the resource.

Another key outcome is in terms of social capital. There is a strong sense of community cooperation, with fishers working together for the well-being of each other, particularly in times when fishing areas are affected by heavy rainfall which results in lobster migration away from these areas. In these instances, fishers with fishing grounds in affected areas are invited to form a partnership with other fishing teams. Self-monitoring and self-policing within their community has been quite successful. This stems from an increased sense of fishing ground ownership, as well as the influence of cultural heritage since the majority of the fishers are third generation, community founding members with strong family ties.

References

Kough, A.S., Paris, C.B. and Butler IV, M.J. (2013). 'Larval Connectivity and the International Management of Fisheries'. *PLoS ONE* 8(6): e64970. Available at: https://doi.org/10.1371/journal.pone.0064970

Lipcius, R.N. and Eggleston, D.B. (2000). 'Ecology and Fishery Biology of Spiny Lobsters'. In: B.F. Phillips and J. Kittaka (eds.), *Spiny Lobsters: Fisheries and Culture,* Second Edition, pp. 1–41. Oxford, UK: Fishing News Book-Blackwell. Available at: https://doi.org/10.1002/9780470698808.ch

Miller, D.L. (1989). 'The evolution of Mexico's Caribbean spiny lobster fishery'. In: F. Berkes (ed.), *Common property resources: ecology and community-based sustainable development*, pp. 185–198. London, UK: Belhaven Press.

Orensanz, J.M. and Seijo, J.C. (2013). *Rights-based management in Latin American fisheries*. FAO Fisheries and Aquaculture Technical Paper No. 582. Rome, Italy: Food and Agricultural Organization of the United Nations. Available at: http://www.fao.org/3/a-i3418e.pdf

Seijo, J.C. (1993). 'Individual Transferable Grounds in a Community Managed Artisanal Fishery'. *Marine Resource Economics* 8: 78–81.

Sosa-Cordero, E., Liceaga-Correa, M.A. and Seijo, J.C. (2008). The Punta Allen lobster fishery: current status and recent trends. In: R. Townsend, R. Shotton and H. Uchida (eds.), *Case studies in fisheries self-governance*, pp. 149–162. FAO Fisheries Technical Paper No. 504. Rome, Italy: Food and Agricultural Organization of the United Nations. Available at: http://www.fao.org/3/a1497e/a1497e14.pdf

Acknowledgements

Halifax, Nova Scotia, Canada Communities fighting food insecurity with self-sustaining initiatives

Sadie Beaton, Miranda Cobb, Will Fawcett-Hill, Marla MacLeod, Laura Mather, Tiffanie Rainville and Satya Ramen

Figure 15 Map of Canada and location of Halifax

Key messages

- Collective action in an unsustainable social-ecological system can catalyse a shift towards increased community sustainability when supported with financial resources and appropriate local institutions.

- Cross-cultural knowledge sharing and place-based learning are integral to transforming social-ecological systems at the community level.

- Social innovation can lead to transformation when supported by a network of collaborative organisations with a shared set of principles and a united vision to inspire change.

Community profile

Nova Scotia, a Canadian province on the Atlantic coast, has a rich cultural fabric, strong food traditions and a long history of fishing, farming and community self-reliance (Figure 15). Food plays a central role for personal, community and ecological health, as well as economic sustainability and vibrant rural and urban communities (ACT for CFS, 2014).

Many communities in Nova Scotia rely on food from large chain grocery stores and discount stores year-round. As a secondary source, and seasonally dependent, there are an increasing number of farmers' markets across the province. However, there are several communities in which grocery stores are physically far away, creating a situation where people rely on what's available at small convenience stores such as those associated with many petrol stations. These stores typically offer prepared, packaged and convenience foods that tend to be high in sugar, salt and fat, and many do not have facilities to offer fresh foods. This exacerbates economic and social inequalities.

Like the rest of North America, the diet of many Nova Scotians features processed and convenience meals, with trends away from whole foods or home cooked meals. In Nova Scotia itself, however, there is a strong history of growing and preserving livestock and produce, which has been resurging through the food movement over the past decade.

Conservation and livelihood challenges

Unfortunately, several rural and urban Nova Scotian communities face issues with accessing healthy and sustainable foods. The rate of food insecurity in Nova Scotia is the third highest in Canada at 15.4% (Tarasuk & Mitchell, 2020; see also Tarasuk, Mitchell & Dachner, 2016; Nova Scotia Government, Finance and Treasury Board, 2020).

The 2017–2018 Canadian Community Health Survey found 15.4% of households in Nova Scotia experience food insecurity, and it is strongly linked to low income and poverty. Furthermore, 19.5% of children under 18 in Nova Scotia live in food insecure households. These are the highest rates of food insecurity among Canadian provinces (ACT for CFS, 2014; Tarasuk & Mitchell, 2020).

Further undermining the strength of the local food system, Nova Scotian farmers and fishers are growing older, with an average age of 56 years and farm debt in Nova Scotia rose fourfold between 1983 and 2010 (Statistics Canada, 2011 and 2012). The next generation of farmers is struggling to access funds and ensure future food supply.

Food security is also connected to the knowledge and skills needed to prepare fresh foods. With prepared food (often unhealthy 'fast food') readily available and heavily marketed, along with multiple demands on our time, preparation of fresh foods is compromised. All of this has implications for the healthcare system, with the rates of some chronic disease in Nova Scotia being among the highest in the country (Nova Scotia Department of Health and Wellness, 2012).

As a community response to these issues, people began initiating self-sustaining food projects such as community gardens. In the past, community garden projects conducted by organisations have not always been successful. The dynamic of underfunded organisations working with other equally underfunded organisations meant there was a propensity for projects to fail or be discontinued. Over time, it became apparent that enthusiasm was not enough to sustain individual garden projects, particularly in vulnerable communities.

Community initiatives

Since the early 2000s, community-based organisations have been taking a closer look at local food systems and working to improve access to healthy, sustainable food. This community story describes the work of four community groups in Nova Scotia's capital city, Halifax, towards

developing positive food environments: i) the Bayers Westwood Family Resource Centre (BWFRC); ii) the Immigrant Settlement Association of Nova Scotia (ISANS); iii) Mulgrave Park gardens; and iv) Common Roots' Urban Farm (CRUF). These groups are linked through their close relationship with the Ecology Action Centre (EAC), an environmental NGO that has been one of the first in Atlantic Canada to begin connecting food systems and environmental issues.

Bayers-Westwood

The Bayers Westwood community, of Halifax's West End, is very diverse, consisting of 358 families, including 60% newcomers. These are mostly single parent families, with many living on disability and income assistance. As one community member described, "The food environment is very challenging. There is never enough food, the food bank runs out, and there are hardly any fruit and vegetables available."

Since their partnership with EAC, the community garden infrastructure and leadership has grown significantly. Bayers Westwood Family Resource Centre hired a seasonal garden coordinator, implemented a percentage of staff time toward food and garden programs, and established core volunteer roles for the ongoing maintenance and coordination of the garden. As a result, they now have capacity to grow more produce for initiatives like local pop-up markets, making their own garden preserves, and increase garden membership. According to the centre, factors supporting healthy food access include growing space, knowledge and skill, and social support.

ISANS: Glen Forest and Multicultural Community Gardens

ISANS is a community organisation that welcomes immigrants to Nova Scotia, offering services and creating opportunities for immigrants to participate in Canadian life. In 2012, ISANS started their first two community gardens; the Glen Forest Garden, followed by the Multicultural Community Garden in 2013. Although vandalism put the gardens at risk, engagement with EAC has increased the capacity to effectively run the gardens. Community members emphasised the need for social support, indicating a connection between social coordination and food

Community garden at Bayers Westwood
Photo: EAC staff

access, such as through the ability to organise seed swaps, bulk food orders and intergenerational language exchanges.

Garden participants often lack basic social support that affects their well-being, including their mental health and livelihood outcomes. As one participant put it, "In my ideal world… I don't have to make a decision between chicken and detergent." As another describes, "I feel better about myself when I am able to buy necessities."

Mulgrave Park

Mulgrave Park is a vibrant public housing neighbourhood with a rich history, comprised of primarily of African-Nova Scotians, in the north end of Halifax, home to over 250 families. Progress in the park is a community development initiative that seeks to empower the residents through entrepreneurial action that inspires inclusiveness and challenges stigma. One major focus of the initiative is food security, including community gardens. The community has developed 12 accessible raised beds, which were built to address the needs of residents living beside the garden. Due to the

multiple intersecting social and economic barriers experienced by the majority of residents, community members were hesitant to invest in the gardening project. However, the children's programme, 'Plants-to-Plates', was incredibly successful at engaging youth, and many days during the summer kids can be found playing and working in the garden. As a result, 70% of youth involved reported eating more vegetables because of the garden programme which led parents to become more open to the project. One parent had this to say about their children: "They love to help me at the garden, they enjoy watering, and enjoy the veggies that I have ready. :)" and "I have the veggies at the garden so I don't need to buy. Just pick-up and enjoy and most important, no chemicals!".

Common Roots Urban Farm

Common Roots Urban Farm (CRUF) is a community garden in Halifax, building "a community-built vision of urban agriculture and productive landscapes" (Food Secure Canada, 2014), and along with over 100 individual and community plots, is made up of a market garden, edible landscaping, and places to sit and relax or learn and work together. Unlike the other gardens, Common Roots has a large volunteer capacity and the majority of participants enjoy a mid-range income. Common Roots also engages with newcomers and immigrants, many of who are living on assistance. Through programmes like Deep Roots, they invite newcomers to volunteer on the farm and employ their extensive farming skills in a new climate. In 2017, the first employee hired there came from the Deep Roots programme.

Practical outcomes

The community garden initiatives helped build engagement and foster agency within the community and among organisational leaders. In combination with information (knowledge), motivation (attitudes and beliefs), ability to act (skills, self-efficacy and access), these individuals and groups contribute to food systems change within their own communities and by joining with others (i.e. through networks).

In short, the gardens provide 'positive food environments', defined by EAC as situations or cultures where communities are equipped to grow,

The HUGS Community Garden in Bayers Westwood
Photo: EAC staff

access and enjoy healthy, sustainable, local foods. These environments include communal resources like community gardens, shared kitchens, greenhouses, root cellars and even food box deliveries. Actions can include sharing food, sharing food knowledge, and working together to create equitable, healthy and sustainable community food systems. The garden initiatives strengthen communities' relationship to food and increase the availability and access to nutritious food, actively involving people in the development of more localised food systems.

There are, of course, challenges to be met. For example, the ISANS community found that access is also allayed by the availability of culturally appropriate food – that is, food that residents would customarily eat – but food banks do not often serve culturally appropriate food (or familiar foods). Participants also spoke of lacking skills/knowledge on preparing the different foods. Language and literacy impacted peoples' ability to buy at the grocery store, and community garden members commented on a lack of transparency in the food system, and an inability to "know what food has chemicals, what is organic and what is not going to cause harm."

Since that time, several participants in the initiatives – namely, EAC, ISANS and CRUF – embarked on a pilot leadership series to up-skill dedicated community gardeners to support the coordination of their gardens, share gardening skills and increase overall sustainability through enhancing leadership

capacity. The series also aims to help support agency among community members who may want to advocate for programmes. Other initiatives include exchanging and co-development of resources, as well as collaborating on community events such as farm tours and workshops.

Government policy

The policy context for gardens on municipal land in the Halifax region is positive. For example, the proposed Centre Plan for Halifax allows and encourages urban agriculture. There is an administrative order within the Halifax Regional Municipality that allows community gardens on municipal land to sell their produce and reinvest the revenue in the garden (i.e. soil). Community development and recreation staff with the municipality may help gardens become established, helping them with the municipality's application process and facilitating in-kind access to on-site infrastructure such as water or electricity.

There is no financial support for community garden implementation from the municipality or the province, beyond the possibility of accessing some small grants, such as through the Community Health Board funding. There are various other barriers; for example, to put up a shed or greenhouse on municipal land, garden groups must secure liability insurance, which most unincorporated, volunteer community garden groups find challenging. In turn, this may impact the development and expansion of gardens.

Ultimately, food is a topic that connects all of us. Community garden projects and food skills workshops have proven to be great entry points to increase awareness and engagement with food issues. Community food programmes are tangible and accessible, building skills and enhancing a sense of agency alongside social and community connections. 'Positive food environments' can also become points of resistance, as community members feel empowered to challenge the status quo (Williams, 2016). Without a doubt, vulnerable populations experience multiple types of marginalisation related to complex power dynamics that create barriers to agency and food security.

Considering a variety of perspectives is beneficial when addressing complex social problems like food security, whether coming from the lens of health, environment, social justice or even cultural celebration. There is value in linking communities together to explore some of the diverse elements of food security work in an integrated approach, recognising food production as just one variable in a much larger complex system.

This approach has fostered the development and integration of community food programming within various Nova Scotian communities. It has also enabled new cross-sectoral collaborations to emerge that help address gaps in access to and availability of healthy foods within a more localised food system.

References

Activating Change Together for Community Food Security (ACT for CFS) (2014). *Making Food Matter: Strategies for Activating Change Together. A participatory research report on community food security in Nova Scotia.* Revised edition (2015). Halifax, NS, Canada: Food Action Research Centre (FoodARC), Mount Saint Vincent University. Available at: https://foodarc.ca/wp-content/uploads/2014/11/Making-Food-Matter-Report_March2015rev.pdf

Ecology Action Centre (2015). *The Our Food Project. Reconnecting Food & Community, 2014–2015.* Halifax, Nova Scotia, Canada: Ecology Action Centre. Available at: https://www.ecologyaction.ca/files/images-documents/file/Food/EAC%20OFP%20AR%20Booklet%20May%2028%20 2015_digital.pdf

Food Secure Canada (2014). *Our 8th Assembly.* Available at: https://foodsecurecanada.org/who-we-are/our-8th-assembly/birds-eye-view-program/thursday-13

Nova Scotia Government. Finance and Treasury Board (2020). *Food Insecurity 2017/2018.* Available at: https://novascotia.ca/finance/statistics/news.asp?id=15544

Nova Scotia Department of Health and Wellness (2012). *Thrive! Strategy. A plan for a healthier Nova Scotia.* Nova Scotia: Communications Nova Scotia.

Tarasuk, V. and Mitchell, A. (2020). *Household food insecurity in Canada, 2017-18. Research to identify policy options to reduce food insecurity* (PROOF). Available at: https://proof.utoronto.ca/wp-content/uploads/2020/03/Household-Food-Insecurity-in-Canada-2017-2018-Full-Reportpdf.pdf

Tarasuk, V., A. Mitchell and N. Dachner. (2016). *Household food insecurity in Canada 2014. Research to identify policy options to reduce food insecurity (PROOF)*. Available at: http://proof.utoronto.ca

Statistics Canada (2011). 'Farm debt outstanding – Agriculture Economic Statistics'. *Statistics Canada* [website]. Available at: https://www150.statcan.gc.ca/n1/en/catalogue/21-014-X

Statistics Canada (2012). 'More farms in Nova Scotia'. *Statistics Canada* [website]. Available at: https://www150.statcan.gc.ca/n1/pub/95-640-x/2011001/p1/prov/prov-12-eng.htm

Williams, P. (2016). '"I would have never...": A Critical Examination of Women's Agency for Food Security Through Participatory Action Research'. In: J. Page-Reeves (ed.), *Women Redefining the Experience of Food Insecurity*. Blue Ridge Summit, PA: Lexington Books.

Acknowledgements

Tsitsikamma, South Africa Food security and livelihood threats from a marine protected area

Ella-Kari Muhl

Figure 16 Map of South Africa and location of the Tsitsikamma Marine Protected Area

Key messages

- The Tsitsikamma area includes local communities whose food security and livelihoods have been impacted negatively by various government actions, notably a no-take marine protected area (MPA).
- While MPAs are promoted as a long-term conservation strategy, no-take MPAs threaten the food security and cultural practices of fishers in areas of low economic opportunity and limited alternative livelihoods or transitional support.

- A lack of communication between the regulating authority (SANParks) and the fishers has increased conflict in the Tsitsikamma area and endangered community members' food security and livelihoods.

- Participatory monitoring, with formalised consultation with community members, may reduce conflict and strengthen conservation goals.

Community profile

Tsitsikamma, or 'place of much water' in Khoisan (the local Indigenous language), is an area interlinking the Western and Eastern Cape Provinces of South Africa. The Tsitsikamma Marine Protected Area (MPA) spans 80 km and affects the food security, cultural practices and livelihoods of eight communities, including Thornham, Stormsrivier, Nompumelelo and Sanddrif (Figure 16). The Tsitsikamma National Park (TNP) MPA was created in 1964, following the 1962 IUCN World Parks Congress. The TNP MPA is the oldest in South Africa.

At first, fishing was permitted in certain areas of the Tsitsikamma MPA, with a permit. This was later restricted in 1976 to only one area, before ultimately becoming a "no-take" MPA in 2000. Since this year, local fishers have been barred from harvesting marine resources despite historically having had access to the ocean and coastal resources. The communities have been reliant on mixed livelihoods, including fishing, for generations. There are currently 5,434 people residing in the four communities who, due to low economic opportunity, are reliant on fishing for food security and consider it part of their cultural practice.

Conservation and livelihood challenges

Historically, the South African government enforced racially exclusionary rules for accessing the coast and its resources, leading to the marginalisation of rural coastal communities (especially in the Eastern Cape and KwaZulu-Natal), which were dependent on coastal resources for their food security and livelihoods (Glavovic & Boonzaier, 2007; Sunde, 2014). In the wake of apartheid, South Africa's National Parks have come under increased pressure to reconcile the wealth of natural resources to the social and economic needs of the previously oppressed black rural communities (Faasen, 2006).

The impacts of 'no-take' MPA
With the abolition of apartheid and introduction of democracy, it was hoped that the right of small-scale and subsistence fishers would be restored in accordance with their culture and tradition (Sowman

et al., 2013). When the legislative change to a "no take" MPA took place in 2000 under the Marine Living Resource Act 18 of 1998, it was shown to affect not only food security for the fishers and their families but also their cultural identity and heritage (Muhl & Sowman, 2020). The Thornham, Stormsrivier, Nompumelelo and Sanddrif communities have been reliant on fishing as a form of food security. With the loss of access to fish, there has been a reported decline in health and increase in crime (Muhl, 2016).

Fishers stated that, in addition, their well-being has been affected by the closure of the MPA, as fishing is part of their identity (Faasen, 2006). The current top-down governmental conservation programme, which introduced a no-take MPA as a form of conservation to promote sustainability and biodiversity, was implemented without consultation with the community, and subsequently has elevated conflict between community members and the regulating authority (Muhl, 2019).

Food security, customary rights and livelihood impacts
With no alternative livelihood provided, local village economies remained limited with few economic opportunities available. Local household economies are poor and under severe stress.

In 2016, for example, only 52.6% of households met the financial requirements for food security, which

The Stormsrivier mouth, which is located centrally in the park, and would be accessible to fishers; however, it is reserved for tourists.
Photo: Ella-Kari Muhl

increases fishers' dependence on marine resources as a supplementary food source. The Reconstruction and Development Programme (RDP) housing created by the South African government in 2001 to create Nompumelelo village added 480 households to the area, placing additional pressure on resources (Maharajh, 2003). The timing of the completion of RDP housing coincided with the delineation of a no-take MPA, increasing competition for work and placing strain on local amenities, with already limited public services and health care.

The change in coastal access and legislation has had a negative effect on the community, with a loss of livelihoods, fishing and recreational activity. The community describe themselves as being 'born on the rocks (coast)', and claim original ancestry from the Indigenous Khoi-san people, indicating a consideration of the coast as a part of their culture and traditions (Faasen, 2006; Muhl et al., 2020).

Many residents in Tsitsikamma have also historically relied on coastal forests for a range of amenities, such as medicinal plants, honey and woods for fuels and building materials, which they are also denied access to.

The lack of recognition as stakeholders and the community's exclusion from the coastline have illustrated that unless social and ecological factors are considered in the design of the MPA, illegal fishing and conflict will continue between SANParks (South African National Parks) and the local communities.

Community initiatives

In 1994, the community created the Tsitsikamma Angling Forum (TAF) to represent local fishers who wanted access to the coast. The TAF have formally petitioned against the management of the TNP in 1976, 1995, 2006 and 2015. They have also worked with a task team comprised of the Kou Kamma municipality and SANParks to reopen the TNP in 2006, 2014 and 2015. The TAF actively protested SANParks in 2007, when over 70 members fished illegally in the Tsitsikamma MPA.

Over time, the community has become increasingly mobilised and in 2015, following workshops between the Department of Environmental Affairs (DEA), Oceans and Coasts Branch, the Department of Agriculture, Forestry and Fisheries (DAFF), SANParks, the local municipality (Kou Kamma) and representatives from TAF, a decision was made to open specific areas within the MPA for fishing with restrictions. The plan to reopen certain areas was approved in December 2015 through promulgation of a government gazette but was then blocked by the Friends of the Tsitsikamma, an association that obtained a court interdict against SANParks, DEA and TAF in January 2016 (RSA DEFF, 2016).

Legal recognition of historically disadvantaged residents

Following the closure in January 2016, the TNP MPA was rezoned later in December 2016 in the new government gazette 40511 (Republic of South Africa, 2016) to allow three controlled fishing areas to be opened.

However, the MPA re-opening process has been questioned as consultation was not carried out with local community members and was poorly conceptualised with minor practical changes for the community's food security or livelihoods.

At present, community members are required to purchase a permit. Older fishers and minors are either prohibited or unable to fish under the new gazette ruling, halting the multi-generational transfer of knowledge. This prevents the oral traditions and teachings of the older generation from being passed to the present. The subsequent absence of SANParks at the controlled zones prevents fishers from communicating effectively with rangers and leads to miscommunication and further resentment towards SANParks.

The challenges and lack of capacity within SANParks reveal the vulnerability of the Tsitsikamma fishing communities and the need to incorporate local ecological knowledge (LEK) and community members into partnerships with researchers and authorities to better manage MPAs.

Practical outcomes

The Tsitsikamma community have issues of food security and a lack of economic opportunities or alternative livelihoods. The creation of the no-take MPA has disrupted a reliance on fish as a contribution to food and cultural practices (Faasen, 2006; Muhl, 2019).

The community members (see photo) have identified five solutions that would be the most beneficial towards restoring trust between community fishers and SANParks:

The Thornham Focus Group members with their list of practical outcomes
Photo: Ella-Kari Muhl

1 **Collaboration**
   Community members and government officials need to work together through a duty of care and environmental stewardship for the Tsitsikamma MPA, along with an understanding that fishers would protect the resource, as long as their cultural rights were preserved and they are allowed access to harvest medicinal plants, fish and other forest items sustainably.

2 **Transgenerational access to Tsitsikamma MPA**
   Emphasis is placed on elders and minors being able to access the coast for fishing and cultural practices. The older generation hold the knowledge and cultural practices from their ancestors – they are instrumental in teaching the youth the importance of using natural resources sustainably and teaching them about the species of fish, the types of medicinal plants and how to harvest them in an environmentally friendly manner.

3 **Education**
   The fishers expressed interest in environmental education workshops for both adults and children, as almost a whole generation has not had access to the sea resulting in loss of knowledge. Fishers listed workshops as being beneficial so that they could better understand why certain species were not allowed to be caught. This would also help to clarify rules as, at present, the new government gazette is unclear and some fishers are unsure of why certain rules are in place.

4 **Communication**
   To empower fishers and effectively promote collaboration, communication is necessary between relevant government departments, SANParks, and working groups made up of interested parties, scientists and elected community members. Increasing the capacity of and empowering local fishers to participate in decision-making processes lead to practical, real solutions that strengthen ownership and promote care of the resource.

5 **Acknowledgement of customary rights and access rights**
   In order to improve management, increased understanding of government officials of the fishers' customary rights and importance of access will foster respect and promote conservation, as well as help reduce tensions and conflict between the two parties.

Future concerns

Dialogue between the community and the regulating authorities is improving; however, for there to be a successful conservation impact, policy makers need to widely consult on proposed changes before implementing them. Top-down processes of government control only serve to further marginalise the community and promote resentment. A working partnership is necessary to establish trust and understanding with an emphasis on local ecological knowledge combined with scientific expertise for better policy and practice.

References

Faasen, H. (2006). 'Synergies between biodiversity conservation and sustainable rural development of adjacent communities: a case study of the Tsitsikamma National Park'. Master's thesis (Conservation Ecology and Entomology). University of Stellenbosch, Stellenbosch, South Africa. Available at: https://scholar.sun.ac.za/handle/10019.1/2913

Glavovic, B.C., Boonzaier, S. (2007). Confronting coastal poverty: Building sustainable coastal livelihoods in South Africa. *Ocean & Coastal Management* 50(1–2), pp.1–23. Available at: https://doi.org/10.1016/j.ocecoaman.2006.07.001

Maharajh, R. J. (2003). 'Values and concerns in decision-making about a waste reduction incinerator at Stormsriver, Tsitsikamma: A case study in applied ethics'. Master's thesis (Philosophy). University of Stellenbosch, Stellenbosch, South Africa.

Muhl, E.-K. (2016). 'Food security and livelihood threats: an investigation into the lives of the fishers bordering the Tsitsikamma National Park'. Honours thesis (unpublished). University of Cape Town, South Africa.

_____ (2019). 'An analysis of the Perceptions Surrounding the re-Zoning of the Tsitsikamma Marine Protected Area'. Master's thesis (Environmental and Geographical Science). Faculty of Science, Department of Environmental and Geographical Science, University of Cape Town, South Africa. Available at: https://open.uct.ac.za/handle/11427/31347

Muhl, E.-K., Esteves Dias, A.C. and Armitage, D. (2020). 'Experiences With Governance in Three Marine Conservation Zoning Initiatives: Parameters for Assessment and Pathways Forward'. *Frontiers in Marine Science* 7: 629. Available at: https://doi.org/10.3389/fmars.2020.00629

Muhl, E.K. and Sowman, M., 2020. Rights, Resources, Rezoning and the Challenges of Governance in South Africa's Oldest Marine Protected Area. *Conservation and Society 18*(4): 366. Available at: https://doi.org/10.4103/cs.cs_19_154

Republic of South Africa (2016). 'Protected Areas Act, 2003, Act No. 57. Regulations for the Management of the Tsitsikamma National Park Marine Protected Area'. *Government Gazette,* Vol. 618, No. 40511, Regulation No. 10676, 19 December 2016. Pretoria. South Africa: Government Printing Works. Available at: https://www.environment.gov.za/sites/default/files/legislations/protectedareasact57of2003%29_regulations_sitsikammanationalpark_gg40511_0.pdf

Republic of South Africa Department of Environment, Forestry & Fisheries (RSA DEFF) (2016). 'Settlement reached in court on the pilot recreational angling project in the Tsitsikamma Marine Protected Area'. *RSA DEFF* [website]. Available at: https://www.environment.gov.za/mediarelease/courtsettlement_tsitsikammamarineprotectedarea; https://www.environment.gov.za/sites/default/files/docs/courtjudgment_ontsitsikammamarineprotectedarea2016.pdf

Sowman, M., Scott, D., Green, L.J.F., Hara, M.M., Hauck, M., Kirsten, K., Paterson, B., Raemaekers, S., Jones, K., Sunde, J. and Turpie, J.K. (2013). 'Shallow waters: social science research in South Africa's marine environment'. *African Journal of Marine Science* 35(3): 385–402. Available at: http://dx.doi.org/10.2989/1814232X.2013.836134

Sunde, J. (2014). *Customary governance and expressions of living customary law at Dwesa-Cwebe: contributions to small-scale fisheries governance in South Africa.* Doctoral thesis (Environmental and Geographical Science). Department of Environmental and Geographical Science, University of Cape Town, South Africa. Available at: https://open.uct.ac.za/handle/11427/13275

Acknowledgements

Olifants Estuary, South Africa Community fishing rights, conservation, and threats from mining

Merle Sowman

Figure 17 Map of South Africa and location of the Olifants Estuary

Key messages

- Fishers of the Ebenhaeser and Papendorp communities in Olifants Estuary have strengthened their voice in negotiations and decisions affecting the estuary and their livelihoods.

- Increased understanding of the importance of the estuary for conservation, livelihood and culture – amongst fishers, government officials and other stakeholders – has led to a greater willingness to work together to achieve socio-economic and conservation objectives.

- Proposed mining activities in the vicinity of the Olifants Estuary pose a new threat to the communities and require ongoing vigilance, mobilisation and collaboration to defend rights and the environment.

Community profile

The people of Ebenhaeser were forcibly removed from their farmlands near Lutzville in the Western Cape of South Africa in 1926 and relocated to unfertile lands adjacent to the Olifants Estuary (Figure 17). The communities have been reliant on the estuary for fishing for generations although in recent years reduced catches have resulted in many seeking supplemental livelihoods (Sowman, 2009; Williams, 2013).

There are approximately 120 fishing families that rely on fishing for food and as a contribution to livelihoods. They live in two main villages adjacent to the estuary – Ebenhaeser and Papendorp. The fishers use rowboats and gillnets, and mainly fish at night. The main target species is mullet but there is also an incidental catch, or 'bycatch', comprising a few linefish species such as elf and silver kob.

Conservation and livelihood challenges

The Ebenhaeser and Papendorp communities face several challenges to their livelihoods, including threats to close the fishery and proposals to build a mine adjacent to the Olifants estuary.

Closure of the gillnet fishery
Over the past 20 years, traditional small-scale fishers at the Olifants Estuary have been facing threats from fisheries scientists and conservationists to close the gillnet fishery. A government policy published in 2005 required that gillnetting be phased out by 2014, while a draft estuary management plan (EMP) published in 2008 recommended the estuary be declared a no-take marine protected area (MPA). The community rejected both the policy and draft plan on the basis of inadequate participation in the decision-making process, and failure to recognise their socio-economic and cultural rights.

Proposed mining adjacent to the estuary
In April 2016, an Australian mining company, with various subsidiaries in South Africa, submitted a mine prospecting application for heavy mineral sands, including zircon, phosphates, garnet, precious stones and diamonds on two farms that lie adjacent to the

View of Olifants Estuary
Photo: Warren Witte

north bank of the Olifants Estuary. The proposed mining area is located on land identified as a critical biodiversity area. The southern boundary of the mining area borders on the sensitive Olifants Estuary and associated habitats (approximately 15 km in extent), while the western boundary is adjacent to the seashore and extends northwards for approximately 18 km. To the north of the proposed mining area, an existing mine is currently operating under the same Australian company.

Fishers at the Olifants Estuary, as well as other community members, are particularly concerned about the negative impacts that the proposed mining activities may have on estuarine habitats, water quality and sediment movement as well as scenic views and sense of place. Of particular concern is its effect on local livelihoods and plans for conservation as well as a community tourism development at the mouth of the estuary.

Although the Basic Assessment Report for the prospecting phase has indicated that no drilling of experimental holes will take place on the estuary banks (Sowman, 2017), fishers are concerned that once approved, environmental controls may be ignored. Fishers are also concerned that should prospecting yield favourable results and mining be approved, the company will request permission to extend the mining operation into the estuary and out to sea, as it happened at the existing mine site.

The lack of accessible information, consultation and transparency associated with the initial basic environmental assessment process led civil society

to submit objections questioning the integrity of the process and the initial assessment report. Despite these objections, the Minister approved the report, which led to a formal appeal procedure in 2018 where fishers, with support from their social partners, raised objections to shortcomings in the public participation process and the quality of the assessment report. Two of the appeals were upheld by the Minister of Environmental Affairs and the applicant was required to undertake further public consultation and prepare a biodiversity assessment of the estuary. However, a revised report has not changed the fisher community's steadfast opposition to mining in the area.

Although there is a policy and legislative framework in place to regulate the mining sector, the increasing power of that sector in South Africa (with strong political backing), presents a serious threat to coastal communities like those living adjacent to the Olifants Estuary. The people of Ebenhaser and Papendorp are facing threats to their livelihoods and way of life – this time due to mining proposals.

Community initiatives

Working with community partners, the Olifants Estuary fishing communities are addressing the challenges facing their community.

Challenging threats to close the gillnet fishery

The Olifants fishing communities collaborated with partners (University of Cape Town, Masifundise Development Trust and the Legal Resources Centre) to challenge proposals to close the fishery and instead developed an alternative vision and set of fishery management proposals for the estuary. The proposals recognise the fishers' rights to resources, while addressing conservation and fisheries management objectives.

Based on longstanding local and scientific knowledge, as well as extensive deliberations amongst fishers and their social partners over a four-year period, the fishers' proposals were presented to the Olifants Estuary Management Forum, a group of representatives from relevant government departments, local famers, fishers

and other interested parties, in November 2013. The EMP was consequently revised to address the rights and interests of the fishing and land claimant communities. The deliberations and negotiations amongst estuary rights-holders and stakeholders have enhanced understanding and trust amongst different stakeholders, providing an enabling environment to advance efforts to achieve sustainable livelihoods and conservation objectives (RSA DAFF, 2012).

A key success to the finalisation of the EMP was a decision to establish a community conservation area (CCA) at the mouth of the estuary that would be co-managed with local community members. While progress has been slow to formalise the CCA, significant progress has been made in bringing different groups together including representatives of the land claimants, fishers, conservation authorities and other estuary stakeholders, to discuss and define the boundaries of the CCA, seek agreement on traditional land use practices on land adjacent to the protected area (i.e. grazing of sheep on the salt marshes during periods of drought) and to develop maps demarcating the area. The next steps in the process include: i) examining various legal entities for formalising the CCA; ii) clarifying the roles and responsibilities of fishers and conservation officials in the co-management arrangement; and iii) identifying community members to participate in a conservation training programme.

While there is renewed support from various conservation agencies to accelerate the process to declare a conservation area at the mouth of the estuary, especially with the threat of mining, the process has been slow due to institutional blockages.

Challenging the mining proposition

Fishers of the Olifants Estuary are once again forced to mobilise the community, and enlist support from researchers, NGOs and CSOs to address the new threat. The recent events highlight the power of mining interests, and confirm that certain departments (mining) wield more power than others (environment) and are still working in silos, pursuing their sectoral mandates without due consideration of the context and the rights and interests of local communities. Once again, it rests on the poor and

marginalised to be vigilant and find ways of tackling proposals that could undermine the ecological integrity of the system, their livelihoods and way of life. Clearly, the partnerships that have developed over the years between the local fishers, researchers and NGOs have enhanced their capacity and agency to engage with traditionally powerful actors and challenge decisions that affect their rights.

Legal recognition of fishing communities

Between 2016 and 2019, the fisheries authority, the Department of Agriculture, Forestry and Fisheries, began putting in place procedures to implement the Small-scale Fisheries Policy promulgated in 2012 (RSA DAFF, 2012). The policy recognises small-scale fishers as a legal category of fishers and commits to protect their rights, give preferential access to coast-dependent communities and provide support to develop this new sector.

The development and promulgation of the new policy and set of regulations (RSA DAFF, 2016) was seen as a victory for small-scale fishers who have been struggling to gain legal access to resources traditionally harvested since the advent of democracy in 1994. However, implementation of the policy is proving complex and challenging, as many thousands of fishers find themselves excluded from the process due to stringent criteria developed by the national government which determines who is qualified or not as a bona fide small-scale fisher.

Some of the traditional fishers of the Olifants Estuary have been left off the official 'list' of those qualifying for long-term fishing rights to resources in the Olifants Estuary. Ongoing work to challenge government decisions regarding who gains access to resources continues.

Thus, despite a new policy which seeks to recognise and protect small-scale fishers and communities, fishers, such as those living at Ebenhaeser and Papendorp, fishers are at risk of being marginalised due to complex administrative procedures, a legalistic approach to interpreting the new regulations, inadequate communication with government, and lack of capacity and skills at the local level to challenge complex state governance systems alone. These challenges, together with the new threat of mining, highlight the ongoing

Young fisher setting off to catch fish
Photo: Jackie Sunde

vulnerability of coastal fishing communities in South Africa, and the importance of building networks and partnerships to challenge unfair decisions, tackle complex administrative procedures and defend local rights.

Practical outcomes

- A much greater appreciation of the rights and interests of different users and stakeholders with interests in the Olifants Estuary has emerged, which has been useful in discussions with the government regarding future management of the estuary and fishery.
- Increased understanding amongst fishers and government officials of the importance of the estuary for conservation, livelihoods and culture and an initiative to declare a community conservation area at the mouth of the estuary.
- A greater willingness amongst fishers and conservation agencies to work together in a co-management arrangement to achieve livelihood and conservation objectives.
- Increased capacity and empowerment of fishers to challenge unjust proposals, plans and policies, and participate in planning and decision-making processes.
- Revision of the Olifants Estuary Management Plan to include fisher's proposals for management of the fishery.
- The gillnet fishery has not been closed despite government's intention to close it at the end of 2014.
- Strengthening of partnerships between fishers, university researchers and other social partners.

References

Republic of South Africa, Department of Agriculture, Fisheries and Forestry (RSA DAFF) (2012). 'Policy for the Small-scale Fisheries Sector in South Africa'. Government Gazette 35455, 20 June 2012. Pretoria, South Africa. Available at: https://www.nda.agric.za/docs/policy/policysmallscalefishe.pdf

_____ (2016) Regulations relating to Small Scale Fishing GNR 229 GG No. 39790, dated 8 March 2016.

Sowman, M. (2017). 'Turning the tide: strategies, innovations and transformative learning at the Olifants estuary, South Africa'. In: D. Armitage, A. Charles and F. Berkes (eds.). *Governing the Coastal Commons: Communities, Resilience and Transformation*, Chapter 2, pp. 25–42. Earthscan Routledge. Available at: https://doi.org/10.4324/9781315688480

_____ 2009. 'An Evolving Partnership: Collaboration between 'experts' and a net- fishery'. Gateways: International Journal of Community Research and Engagement 2: 119–143. Available at: https://doi.org/10.5130/ijcre.v2i0.1174

Williams, S. (2013). 'Beyond rights: Developing a conceptual framework for understanding access to coastal resources at Ebenhaeser and Covie, Western Cape, South Africa'. Doctoral thesis (Environmental and Geographical Science). Department of Environmental and Geographical Science, University of Cape Town, South Africa. Available at: https://open.uct.ac.za/bitstream/handle/11427/4819/thesis_sci_2013_williams_samantha.pdf?sequence=1&isAllowed=y

Acknowledgements

Chilika Lagoon, India Reflections on community conservation

Prateep Kumar Nayak

Figure 18 Map of India and location of Chilika Lagoon

Key messages

- Fisher communities in the Chilika Lagoon should be an integral part of policy creation for lagoon conservation and governance.

- Community-based institutions can be revived and re-engaged in the management of capture fishery in order to strengthen fishery-based community livelihoods and food security.

- In Chilika Lagoon, the majority of outmigration is temporary or seasonal in nature, which makes it possible for migrating fishers to reoccupy their customary fishing spaces if aquaculture is vacated.

Community profile

Connected to the Bay of Bengal in the south, with the Eastern Ghats mountain ranges forming most of its catchment on the north and the west, Chilika Lagoon is a Ramsar Site of international conservation importance and a biodiversity hotspot (Figure 18).

Rare, vulnerable and endangered species inhabit the lagoon. It is the largest wintering ground for migratory waterfowl found anywhere on the Indian subcontinent and home to Irrawaddy dolphins and the Barkudia limbless skink. The total number of fish species is reported to be more than 225. Along with a variety of phytoplankton, algae and aquatic plants, the lagoon region also supports over 350 species of non-aquatic plants. A survey carried out by the Zoological Survey of India in 1985–87 recorded over 800 species of fauna. This represents a solid ecological foundation to the lagoon's small-scale fisheries system.

The Chilika community
Regional biodiversity is an integral part of sustaining the culture and livelihoods of the roughly 400,000 fishers and their families, who live in more than 150 villages. People in these villages have been engaging in customary fishing occupations for generations. The fishery consists of traditional fisher groups whose vocation is identified by their membership in certain Hindu castes: there are seven different types of fisher castes and five sub-castes in Chilika. The lagoon ecosystem also indirectly supports 800,000 non-fisher higher caste villagers (e.g. Brahmins, Karans, Khandayat and Khetriyas) in the watershed areas, whose occupants traditionally engage in farming, forestry and other livelihood occupations.

Conservation and livelihood challenges

Due to large-scale forest and land degradation, subsistence based on agriculture and forestry is on the decline. Consequently, a number of non-fisher caste members have now turned to aquaculture, and in some cases regular capture fishing as a growing source of income (see photo). In the 1980s, for example, as shrimp aquaculture grew, questions arose about access, usage rights and changes to the rules of the game in the lagoon fish economy. Several

Aquaculture ponds in Chilika
Photo: Prateep Nayak

policy changes were implemented in early 1990s to support aquaculture, including provisions to lease out lagoon areas to non-fishers for aquaculture activities. Another detrimental force on the Chilika lagoon was the opening of a new sea mouth to the Bay of Bengal in 2001, which has had a direct impact on biophysical processes and, by extension, associated livelihood systems. Some of the key challenges resulting from the above two scenarios are described below:

Conservation consequences
- Disturbance of the salinity regime and the fresh water/saltwater balance.
- Random changes in water depth.
- Increase in sand deposits, especially in the lagoon's outer channel areas near the new sea mouth.
- Changes in the nature of the water inflow and outflow during high and low tides.
- Infestation of barnacles affecting both fishers and their equipment.
- Sudden appearance of what local people call sea creatures, such as the stingray, octopus and jelly fish.

Social and livelihood consequences
- Fish production reached an all-time low, and the small-scale fisher economy, efficiently run by caste-based fishers and their organisations for centuries, began to collapse.
- Household incomes dropped as a result of the decline in fish production, contributing to the loss of fishery-based livelihoods.
- Local subsistence and household economies came under stress, severe food insecurity in fisher

communities became evident, increasing fishers' dependence on staggering amounts of cash loans with interest rates of 60%–120% per annum.

- More than one-third of adult fishers and their families were occupationally displaced from fishing and either migrated to urban centres as unskilled workers or took up daily wage labour.
- Elite capture of customary fishing areas through encroachment acted as a vehicle for the growth of aquaculture in Chilika. Influential people took control of the lagoon resulting in serious issues around fishers' access rights and entitlements.

Community initiatives

Fishers use a well-known metaphor which best explains the level of their response to these challenges and initiatives: "For the poor, when hunger becomes unbearable, movement and protest becomes our last resort". This suggests that social and political struggles and movements are the ultimate options for the fishers when social, economic, political and environmental problems become rampant. Fishers realise that when everything seems to be going against them and nothing really works in their favour, coming together to protest the acts of the external forces becomes an obligation.

In the past, such protest movements have been effective. In 1992, for example, the Tata Industrial Group withdrew due to massive protest and lobbying by fishers which resulted in a denial of environmental clearance to the corporation from the central environment ministry. Legal activism gave rise to successful court cases in the State High Court and Federal Supreme Court, leading to a ban on aquaculture in and around the lagoon.

In 1999, an anti-aquaculture protest movement was launched by the Fisher Federation with support from the National Fishworkers Forum (India) (https://nffindia.org/wp/) and the World Forum of Fish Harvesters and Fish Workers (https://www.worldfisher-forum.org/who-we-are). The Chilika Fisher Federation continues to play a leadership role in fighting for fishers' rights.

Chilika fisher protest movement
Photo: Prateep Nayak

Livelihood reactions from fishers include efforts at diversification of occupation such as seasonal outmigration and non-fishing income activities.

Traditional village institutions have taken initiative to fill the gap created by the gradual dysfunctionality of the primary fishing cooperative societies due to recent policy changes and decrease in fish production. To plan for the future, within the villages, several community meetings and policy workshops have been held.

During 2018, the Chilika Development Authority undertook one of the largest ever removal of illegal aquaculture activities in the lagoon as per the pending court orders. As a result, close to 100% of aquaculture farms closed down in Chilika. The government initiative was view in a positive light by the fisher communities and became a landmark event in rebuilding collaboration with the state departments. However, given the involvement of powerful people and social elites in aquaculture, and due to local caste politics, it remains to be seen whether (and how soon) the lagoon might be back under the aquaculture influence again.

Practical outcomes

A series of specific proposals arose from community meetings, including:

- Fishers expressed their desire for priority to be given to community level institutions, while also

recognising that other institutions at multiple levels can work together with local institutions.

- Communities feel that the dominance of higher-level government institutions can be minimised and bottom-level institutions, who often do not get an opportunity to participate in fishery related decision-making, should gain some much-required political space and voice.
- The fishers also noted the need to revise some of the earlier institutions that have been dissolved by the government, such as the Central Fishermen Cooperative Marketing Society, or those that have become dysfunctional such as the Primary Fishermen Cooperative Societies at the village level.

Along with the above points, the fishers are interested in pursuing a possible solution to the governance issues faced in the Chilika lagoon through the introduction of a polycentric system of governance – one which would involve multiple authorities at differing scales, rather than a monocentric unit, and with each authority having considerable independence to make their own norms and rules. Suggestions for polycentric arrangements came from the fishers, with a key element being that the fishery institutions in the Chilika lagoon would have some authority to create regulations, to tap the community's local knowledge and learn from others engaged in similar systems.

Although many of the required institutions are already present in the lagoon, a shift to a polycentric arrangement would make the responsibilities and the authorities of each institution clear, and make it easier to hold institutions accountable when they detract from their responsibilities. Fostering communication between governing authorities would, for example, elicit and share information about what has worked well in one setting of the lagoon, ensuring that if one governing authority fails there are others that can be relied upon.

References

Nayak, P. K. and F. Berkes. 2010. 'Whose marginalisation? Politics around environmental injustices in India's Chilika Lagoon'. *Local Environment* 15(6): 553–567. Available at: https://doi.org/10.1080/13549839.2010.487527

Additional readings on Chilika Lagoon

Nayak, P.K. (2014). 'The Chilika Lagoon Social-Ecological System: An Historical Analysis'. *Ecology and Society* 19(1): 1. Available at: http://dx.doi.org/10.5751/ES-05978-190101

_____ (2015). 'Institutional Pluralism, Multilevel Arrangements and Polycentricism: The Case of Chilika Lagoon, India'. In: M. Bavinck and A. Jyotishi (eds.), *Conflict, Negotiations and Natural Resource Management: A legal pluralism perspective from India*, pp. 148–177. London, UK: Routledge.

_____ (2017). 'Conditions for Governance of Tenure in Lagoon-Based Small-Scale Fisheries, India'. In: S. Jentoft, R. Chuenpagdee, M.J. Barragán-Paladines, N. Franz (eds.), *The Small-Scale Fisheries Guidelines: Global Implementation*, pp. 165–189. The Netherlands: Springer. Available at: https://doi.org/10.1007/978-3-319-55074-9

_____ (2017). 'Fisher communities in transition: understanding change from a livelihood perspective in Chilika Lagoon, India'. *Maritime Studies* 16:13. Available at: https://doi.org/10.1186/s40152-017-0067-3

Nayak, P.K. and Armitage, D. (2018). 'Social-ecological regime shifts (SERS) in coastal systems'. *Ocean and Coastal Management* 161: 84–95. Available at: https://doi.org/10.1016/j.ocecoaman.2018.04.020

Nayak, P.K., Oliveira, L.E. and Berkes, F. (2014). 'Resource degradation, marginalization, and poverty in small-scale fisheries: threats to social-ecological resilience in India and Brazil'. *Ecology and Society* 19(2): 73. Available at: http://dx.doi.org/10.5751/ES-06656-190273

Acknowledgements

Qeshm Island, Iran Community-led conservation and ecotourism

Razieh Ghayoumi and Anthony Charles

Figure 19 Map of Iran and location of Qeshm Island

Key messages

■ The people and communities of Qeshm Island, a UNESCO Global Geopark, have a strong connection to the land and sea. This connection, and a strong sense of environmental belonging, has encouraged them to actively participate in community conservation, and to develop sustainable livelihoods.

■ Qeshm Island is home to sacred sites and species, which can provide a foundation for community-based conservation areas.

■ Ecotourism offers economic, ecological and conservation benefits to the residents of Qeshm Island, while being respectful to the local culture and new forms of livelihood.

Community profile

Qeshm Island (Figure 19) is the largest island in the Persian Gulf, Southern Iran – about 130 km long and 11–35 km wide (Karami et al., 2018; UNESCO, n.d.). The weather is hot and humid with mild and short winters. In 2016, the total population was 148,993.

In 2017, Qeshm Island was declared a UNESCO Global Geopark (a geographical area where sites and landscapes are of international geological significance).[15] Notably, the island includes Qeshm County, on the eastern part of the island, and the Hara Protected Area, on the north coast (UNESCO, n.d.).

Qeshm Island is well known due to the region's historical background, customs, traditional clothes, fishing, festivals, sacred sites and ecotourism attractions, such as mangrove forests, turtle hatcheries, coral reefs, coastal diversity, marine mammals and attractive geographical phenomena (Qeshm Free Area Organization, 2013; Duchaine et al., 2010). The main sources of income for the people on Qeshm Island are fishing and maritime trade (Duchaine et al., 2010).

Conservation and livelihood challenges

Local communities on Qeshm Island face numerous threats and obstacles to sustainable development, including lack of recognition, inappropriate tourism, climate change, acculturation (influx of non-native people for trade and visiting), inappropriate development, illegitimate jobs (smuggling clothes and foods), overfishing, pollution, capacity for oil/gas/mineral exploration, habitat reduction, hot weather, limited fresh water resources and lack of appropriate infrastructure.

Community initiatives

Two decades after development grew on Qeshm Island, the local people have shown resilience to detrimental change and increased their efforts to keep traditions alive, conserve the environment

Tela sacred wells in historical port of Laft, Qeshm Island
Photo: Razieh Ghayoumi

and build the economy in a way that fits with local values. The local communities reflect a sense of belonging, livelihood needs and spiritual and social values in their involvement with conservation, and in learning how to develop tourism based on their natural attractions and their culture (Qeshm Free Area Organization, 2013).

Culture

Communities are working to maintain or restore various cultural activities. Among them are the following three examples drawn from Ghayoumi (2014):

1 In Salakh village, in the south of the island, as well as other communities, celebrations of the Fisherman's Norooz (Norooz-e Sayyad) – a 'new year' for the fishery – take place in late July. On this day, people do not fish or consume seafood, believing that the aquatic resources need a break for reproduction. They swim in the sea, in order to be fresh and healthy until the next Fisherman's Norooz. In the festival, people wear new clothes, prepare many types of traditional foods, and engage in traditional drumming, dance and plays (Amani, 2013; Moormogoui et al., 2013).

2 Various tree species are considered sacred by the local people. One of these is the fig tree (loor or *lool*, its local name), large trees that are respected particularly as a result of the shade they provide, important in hot weather. Fig trees have a deep

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15   For further information, please see: http://qeshmgeopark.ir/en/pages/geopark/unesco-global-geopark

connection to Indigenous life and culture, with some even having their own individual names, and some being considered 'wish trees' as people believe their wishes will be granted by the tree (Fallahtabar, 2017).

3 Tela wells (in the historical port of Laft) are sacred to the local people. The wells are ancient but their age is unknown. There were once 366 wells, each with a specific name. However, due to storms and earthquakes in recent years, the number of wells has been reduced to around 100 (Dashtizadeh, 2012; Dashtizadeh et al., 2013; Negahban & Jamadi, 2012).

4 In the past, methods for efficient water use were extremely important, as was the sustainable use of natural resources. A female water guardian, or water master known as a *Mirab*, carried out traditional water management (Dashtizadeh, 2012). Due to climate change, decreases in water resources and cultural changes in water use, as well as the modernisation of lifestyles and consumption patterns, local people use these wells much less than before.

Conservation

Local residents of Qeshm Island voluntarily participate in conservation programmes such as sea turtle (Hawksbill) conservation (Hawksbill). In Shibderaz Village, in collaboration with the village council and Qeshm Free Zone Organization, around 25 km of the south coast has been declared a turtle breeding and hatchery area.

During the nesting and hatchery season, local people educate the public, patrol beaches, tag turtles, collect eggs, transfer eggs to special safe sites and guard the eggs (see photo). Women make different kinds of handicrafts with the sign of the sea turtle. They also have ecotourism activities to introduce their village and turtle conservation programme to tourists (UNDP/GEF/SGP, 2003).

The appreciation for the benefits of conservation has led to local interest in building a community-based marine and coastal conservation area on Qeshm Island, before development makes a greater impact.

Setting up a safe place for turtle egg hatching and monitoring in Shibderaz village, Qeshm Island
Photo: Razieh Ghayoumi

This protected area could be developed in a manner that draws on the successful models practiced in other countries, such as Australia, and incorporates research, monitoring and education (Smyth, 2008). In any case, the model used should be localised to fit the needs and aspirations of the Qeshm Island community. Mechanisms, such as Indigenous marine resource use, monitoring, research and education, could be used to help manage areas of interest, since there is recognition of the value of a mixture of techniques and conservation approaches. Such an initiative will create more opportunities for the local people to become involved with conservation and tourism activities. In this regard, governmental and non-governmental organisations (NGOs), universities and research institutes could benefit from the support of the island community to develop local capabilities, and should provide assistance to establish a community-based marine conservation area through community involvement, networking, workshops, training activities and research.

Practical outcomes

Qeshm Island, as a special place of biodiversity and history, has many tourist attractions specific to the island's features, such as the traditional architecture called louvers, which are particularly prevalent in the historical port of Laft. Water reservoirs spread out everywhere on the island and dhow (fishing boat) building and traditional dance and folk music are part of the traditions of the local residents (Qeshm Free Area Organization, 2013; Dashtizadeh et al., 2013; Negahban & Jamadi, 2012).

Communities lead various ecotourism activities, including tours to see dolphins, mangrove forests, turtle nesting sites, coral reefs, nature attractions, natural sacred sites, historical tours and scuba diving. Tourists can also purchase handicrafts and enjoy local food cooked in a community member's home (Qeshm Free Area Organization, 2013). Such activities have provided economic, social and environmental benefits to the community, including job creation and reduction of the rate of emigration. It seems that the increase in forms of ecotourism that focus on community traditions and natural attractions has provided Qeshm Island residents with the opportunity to preserve and maintain their culture and natural resources, notably the traditional practices that are, on Qeshm Island, often associated with conservation and sustainable use of natural resources.

References

Dashtizadeh, A. (2012). *Qeshm; Heritage of the Persian Gulf*. Cultural Heritage, Handicrafts and Tourism Organization. Qeshm Free Zone Organization.

Dashtizadeh, A., Fazel, M. and M. Zobeiri, A. (2013). Laft Port in "Qeshm Island Geopark, the Land of Beauty", *Monthly News Magazine, Qeshm Island Geopark*, No. 1: 3. Available at: http://qeshmgeopark.ir/files/files/file/b5f913ab-fe3c-490c-97b9-607f1cebd14a/Qeshm%20Island%20Geopark%20The%20Land%20of%20Beauties%201.pdf (in Persian)

Duchaine, J., Hughes, H., Flippin, A. L. and Murphy, S. (2010). Frommer's 500 extraordinary islands. Hoboken, N.J: Wiley Publishing Inc.

Fallahtabar, N. (2017). 'The state of ecotourism in sustainable development of Qeshm (By utilizing of SWOT model)'. *Quarterly of Geography* (Regional Planning) 7(1): 29–42. Available at: http://www.jgeoqeshm.ir/article_44986.html (in Persian)

Ghayoumi, R. (2014.) *Marine and Coastal Indigenous and Community Conserved Areas (ICCAs) in the South of Iran and a Review of Related Laws*. The United Nations-Nippon Foundation Fellowship Programme. Division for Ocean Affairs and the Law of the Sea. Office of Legal Affairs. United Nations. New York. Available at: https://www.un.org/depts/los/nippon/unnff_programme_home/fellows_pages/fellows_papers/Ghayoumi_1314_Iran.pdf

Karami, Z., lotfi, H., Naseri Manesh, A. (2018). 'Planning tourism development in Iran with emphasis on the development of Persian Gulf islands; Qeshm Island'. *Geography* (Regional Planning) 8(4): 369–393. Available at: http://www.jgeoqeshm.ir/?_action=article&au=470492&_au=Karami,%20Zein%20al-Abedin (in Persian)

Moormogoui, M., Fazel and M. Zobeiri, A. (2013). Norooz-e Sayyad Festival (Fisherman Annual Ceremony) *Monthly News Magazine Qeshm Island Geopark* No. 2: 3. Available at: http://qeshmgeopark.ir/files/files/file/586adba6-bb85-4b50-9677-7b9f8db0d178/Qeshm%20Island%20Geopark%20The%20Land%20of%20Beauties%202.pdf (in Persian) (Accessed 30 March 2020).

Negahban, M. and Jamadi, A. (2012). T*he Architecture of Qeshm Island*. Maahoma: Tehran, Iran. Available at: http://qeshmgeopark.ir/files/files/file/41517395-884e-4ce0-88b0-a1dcfb6fd0f6/The%20Architecture%20Of%20Qeshm%20Island.pdf (in Persian)

Qeshm Free Area Organization (2013). *Qeshm Geopark Guide*. Qeshm Free Zone, Hormozgan Province, Iran: Qeshm Geopark. Available at: http://qeshmgeopark.ir/files/files/file/04f4eed6-4e8d-4e63-9f97-326f3460c3ce/Qeshm%20Geopark.pdf

Smyth, D. (2008). 'Just Add Water? Taking Indigenous Protected Areas into Sea Country'. In: D. Smyth, and G. Ward (eds.), *Indigenous Governance and Management of Protected Areas in Australia*, Chapter 8 pp 95-110. E-book published by the Australian Institute of Aboriginal and Torres Strait Islander Studies. Available at: https://citeseerx.ist.psu.edu/viewdoc/

United Nations Development Programme/Global Environment Facility/Small Grants Programme (UNDP/GEF/SGP) (2003). Onshore Preservation of Hawksbill Turtle Eggs through Community Participation. Shibderaz, Qeshm. Project Number: IRA-G52-2003, 2004 & 2007- 024(IRA98G52). Available at: http://sgpgef.ir/uploads/Community%20based%20turtle%20conserv%20(216u).pdf

United Nations Educational, Scientific and Cultural Organization (UNESCO) (n.d.). 'Qeshm Island UNESCO Global Geopark (Islamic Republic of Iran)'. *UNESCO Earth Sciences* [website]. Available at: http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/unesco-global-geoparks/list-of-unesco-global-geoparks/iran/qeshm-island/

Indigenous communities in Bolivia's northern Amazon Opportunities and challenges

Alison Macnaughton

Key messages

- Introduced fish species in the Bolivian Amazon could provide Indigenous communities with livelihood opportunities, but may also be a threat to their critically-important subsistence fisheries through predation and territorial exclusion.

- Local fishery organisations can be strengthened through ongoing dialogue, leadership training and technical assistance.

- Engaging with local, regional and national level actors and promoting open spaces of dialogue (workshops, round table groups) can help identify common interests, resolve conflicts and support discussions on future planning.

Community profile

The river systems of the northern Bolivian Amazon (Pando and Beni departments) are home to a number of Indigenous groups (among them are Chácobo, Pacahuara, Takana, Cavineño and Esse Eja), who have historically practiced traditional hunting and gathering (Figure 20). A region of flood forests, upland tropical forests and savannahs, it is home to a high diversity of fish species and is considered of high ecological significance (Carvajal-Vallejos et al., 2014; Ibisch et al., 2003).

In 1996, after more than a century of colonial exploitation for rubber and Brazil nut harvesting, the *Ley del Servicio Nacional de Reforma Agraria*, better known as the INRA Law of 1996 for Agrarian Reform, marked the start of a process of redistribution of land to Indigenous groups, as traditional users, organised into communal tenure arrangements designated as *Tierras Comunitarias de Origen* (Original Community Territories, or TCOs). There are currently four TCOs in the region, established in the early 2000s, with a combined area of 1.5 million hectares, and a population of 8,200 people spread out in 93 communities, mostly located close to rivers or lakes with limited access to regional urban centres.

The main livelihood activities in TCOs include seasonal harvesting of Brazil nuts and other non-timber forest products, family-based agriculture (yucca, plantain), and year-round hunting and fishing.

Regulations created at the level of the TCO establish which types of resources may be used for subsistence and/or commercial use, and recognise each community's areas to fish, hunt and harvest, with shared-access arrangements, where necessary. In most cases, there is also a need to develop more specific local and regional resource management plans.

Conservation and livelihood challenges

Illegal entry by outsiders for unregulated activities, such as commercial logging and fishing, poses a significant threat to resources. Additionally, high rates of poverty, food insecurity and vulnerability

Traditional houses in Baketi community, TCO Cavineño (2015)
Photo: A. Macnaughton

exacerbate local challenges (Macnaughton et al., 2016).

Fisheries based on abundant and diverse native fish are a cornerstone of local subsistence for most communities and a secondary livelihood for some. However, the future of the native species fishery is somewhat uncertain, due in large part to an introduced species, paiche (*Arapaima gigas*). The world's largest scaled fish, paiche was brought in 1965 to the headwaters of Madre de Dios River (Peru) (Carvajal-Vallejos, 2011). This air-breathing and fast-growing fish has spread into a significant portion of the Bolivian Amazon (Carvajal-Vallejos et al., 2014) and is now relatively abundant in lakes and river eddies. In other parts of the Amazon Basin, where it is native, paiche is an iconic species with high commercial value, a history of over-exploitation and some successful community-based conservation initiatives (Castello et al., 2011). Although paiche are not native to Bolivia, they remain sensitive to fishing pressure.

Since the 1990s, unmanaged commercial fisheries in the Bolivian Amazon have been rapidly increasing; current production is estimated to be upwards of 7,000 tonnes per year. The rapid expansion is largely attributed to increasing paiche fisheries.

To date, few Indigenous communities take part in the commercial fishing of paiche on a regular basis, despite the need for income-generating opportunities and high, unsatisfied demand for fish in regional markets. This behaviour may be due to a variety of factors, including cultural norms, distance from and access to markets, inadequate equipment (nets)

poor access to cold-storage (ice) and low returns to producers.

Urban-based fishers from the main regional port of Riberalta now target paiche almost exclusively and sometimes invade TCOs to access the lakes where paiche is most abundant. Such activities have contributed both to conflicts and to new opportunities for trade, although equity remains a concern (Salas & Macnaughton, 2015). For TCOs, paiche could be a livelihood opportunity, but may also be a threat to critical subsistence fisheries through predation and territorial exclusion.

Community initiatives

Since 2011, the Indigenous communities have engaged in research with the Asociación Faunagua, World Fisheries Trust and the University of Victoria (Canada) to better understand the fisheries situation, and identify pathways to improve livelihood and food security in the region. Much of this work has focused on the paiche, providing key information on abundance and impacts, as well as potential for development. So far, these efforts have provided important information on:

- Nutritional status and food security of rural and urban populations and key determinants, including the contributions of fish (Baker-French, 2013);
- Fisheries and other livelihood activities, and local perspectives about paiche; and
- Fishery value chains and mechanisms to improve transparency and promote greater economic equity between fishers, middlemen and markets (Macnaughton et al., 2016; Coca et al., 2012).
- There have also been a range of practical initiatives, including:
- Pilot initiatives for value-added fish production, for example, the establishment of a cooperative in one of the Indigenous communities, where paiche fillets and skins (for leather production) are produced and sold at improved prices;
- Strengthening local fisheries organisations through ongoing dialogue, leadership training and providing technical assistance, i.e. consolidation of the regional fisher association; and
- Engaging with local, regional and national level actors and promoting open spaces of dialogue (workshops, round table groups) to identify

Fisheries based on abundant and diverse native fish are a cornerstone of local subsistence for most communities and a secondary livelihood for some.
Photo: A. Macnaughton

common interests, resolve conflicts and discuss future planning (Salas & Macnaughton, 2015).

Practical outcomes

Indigenous governments in the region were able to express concerns and priorities directly to the national government through a national multi-stakeholder workshop held to discuss issues and opportunities surrounding paiche. This was also an opportunity to meet with representatives of commercial fishing.

Subsequently, the Ministry of Environment passed an administrative resolution for paiche fishery regulation and management, authorising paiche fishing in protected areas (PA) and TCOs as a conservation measure to protect native fauna.

While the presence of paiche and associated concerns about how to manage them has contributed to a significant increase in public attention to the fisheries sector in Bolivia, there is still a need for greater attention to the specific situation of Indigenous fisheries. Notably, in terms of development and implementation of resource management plans within the current TCO system, including monitoring. Enforcement of exclusive

access to aquatic resources must also be improved to better protect resources and/or benefits to Indigenous people.

Specific needs for the Indigenous communities include:

- Capacity-building for communities and local organisations to identify and articulate local needs and priorities for development and conservation.
- Development and implementation of resource management plans and other governance tools at a local level.
- More effective engagement in regional planning.
- Support for greater transparency, communication and cooperation between agencies responsible for regulating fishing and fish markets.
- Improving returns to fishers, for example, through value-added opportunities or improved pricing structure.

References

Baker-French, S.R. (2013). *Food Security and Nutritional status in Fishing Communities in Bolivia's Northern Amazon: Results of a Household Survey.* Master's thesis (Human Nutrition). University of British Columbia, Canada.

Carvajal-Vallejos, F.M., Van Damme, P.A, Cordova, L. and Coca, C. (2011). 'La introducción de Arapaima gigas (paiche) en la Amazonía boliviana' (The introduction of Arapaima gigas (paiche) in the Bolivian Amazon). In: P.A. Van Damme, F.M. Carvajal-Vallejos, J. Molina (eds.), *Los peces y delfines de la Amazonía boliviana: habitats, potencialidades y amenazas,* Chapter 15, pp. 367–396. Cochabamba, Bolivia: INIA, Imprenta Unicornio. Available at: https://www.academia. edu/1434883/La_introducci%C3%B3n_de_Arapaima_ gigas_paiche_en_la_Amazon%C3%ADa_boliviana

Carvajal-Vallejos. F.M., Bigorne, R., Zeballos Fernández, A.J., Sarmiento, J., Barrera, S., Yunoki, T., Pouilly, M., Zubieta, J., De La Barra, E., Jegú, M. et al. (2014). 'Fish-AMAZBOL: a database on freshwater fishes of the Bolivian Amazon'. *Hydrobiologia* 732: 19–27. Available at: https://doi. org/10.1007/s10750-014-1841-5

Castello L., Stewart, D.J. and Arantes, C.C. (2011). 'Modeling population dynamics and conservation of arapaima in the Amazon'. *Reviews in Fish Biology and Fisheries* 21: 623–640. Available at: https://doi.org/10.1007/s11160-010-9197-z

Coca Méndes, C., Rico López, G., Carvajal Vallejos, F., Salas Peredo, R., Wojciechowski, J.M. (2012). *La Cadena de Valor del Pescado en el Norte Amazónico de Bolivia: la contribución de especies nativas y de una especie introducida (el paiche – Arapaima gigas)* (The Fish Value Chain in the Northern Amazon of Bolivia: the contribution of native species and an introduced species (the paiche – *Arapaima gigas*). La Paz, Bolivia: Embajada Real de Dinamarca, IDRC, Fundación PIEB. Available at: https://www. pecesvida.org/content/4-publicaciones/2-publicaciones-tecnicas/14-la-cadena-de-valor-del-pescado-en-el-norte-amazonico-de-bolivia-contribucion-de-especies-nativas-y-de-una-especie-introducida-el-paiche-arapaima-gigas/cocaal.2012-cadena-de-valor-del-pescado.pdf

Ibisch, P., Chiv, J., Espinoza, S. and Araujo, N. (2003). 'Hacia un mapa del estado de conservación de los ecosistemas de Bolivia' (Towards a map of the state of conservation of Bolivia's ecosystems). In: P. Ibisch and G. Mérida (eds.), *Biodiversidad: La riqueza de Bolivia. Estado de conocimiento y conservación,* pp. 264–272. Santa Cruz de la Sierra, Bolivia: Ministerio de Desarrollo Sostenible, Editora FAN.

Macnaughton. A.E., Rainville, T.K., Méndez, C.I.C, Ward, E.M., Wojciechowski, J.M., Carolsfeld, J. (2016). Gender transformative approaches with socially and environmentally vulnerable groups: Indigenous fishers of the Bolivian Amazon. In: J. Njuki, J. R. Parkins, A. Kaler (eds.), *Transforming Gender and Food Security in the Global South,* Chapter 9, pp. 217–240. London, UK: Routledge and International Development Research Council. Available at: https://doi. org/10.4324/9781315564111

Salas, R. and Macnaughton, A. (2015). *Improving governance in fisheries and fish farming in the Bolivian Amazon basin (Stories of Change)* [online]. Available at: https://www. idrc.ca/sites/default/files/sp/Docume nts EN/Improving-governance-fisheries-fish- farming-Bolivia.pdf (available in Spanish version)

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Clayoquot Sound, Canada Community engagement in a UNESCO Biosphere Reserve

Laura Loucks

Key messages

- Collective action in an unsustainable social-ecological system can catalyse a shift towards increased community sustainability when supported with financial resources and appropriate local institutions.

- Cross-cultural knowledge sharing and place-based learning are integral to transforming social-ecological systems at the community level.

- Social innovation can lead to transformation when supported by a network of collaborative organisations with a shared set of principles and a united vision to inspire change.

Community profile

For millennia, the Indigenous Nuu-chah-nulth people have had strong cultural and livelihood connections with terrestrial and marine ecosystems in the west coast of Vancouver Island, Canada. Within this area, Clayoquot Sound is located primarily in the Nuu-chah-nulth **Ha' huulthii** (homelands) of Hesquiaht, Ahousaht and Tla-o-qui-aht First Nations, encompassing nearly 350,000 hectares of a complex and globally significant social-ecological landscape (Figure 21).

The ecosystems of Clayoquot Sound are rich in biodiversity and characterised by a large contiguous canopy of old growth rainforest, covering steep-sided coastal mountains throughout six salmon-bearing river watersheds.

There are five different species of Pacific salmon which originate from the rivers of Clayoquot Sound and each supports some element of culture, economy and food supply for eight different communities within the region: Hesquiaht, Ahousaht, Opitsaht, Tofino, Estowista/Ty-Histanis, Ucluelet, Hitacu and Macoah.

In 2000, Clayoquot Sound was designated a United Nations Educational Scientific and Cultural Organization (UNESCO) Biosphere Reserve. The nomination for the protected area was made after more than a decade of conflict and community action to prevent the logging of old growth coastal temperate rainforests. The key conservation goals of UNESCO Biosphere Reserves are to conserve biodiversity and to safeguard the sustainability of natural and managed ecosystems by uniting communities and nations in peace and cooperation, through education, science, culture and communication (UNESCO, 2017).

Conservation and livelihood challenges

Resource extraction, conflict and collective action

Over the last 50 years, local communities have constantly struggled to assert local access rights to Crown resources and shape government policies for more sustainable resource management practices in fishing and logging. In the forestry industry, unresolved Aboriginal land claims and corporate rights to Timber Forest Licenses were at the heart of unsustainable land use. For example, logging companies commonly built roads along steep mountain slopes, despite the high risk of soil erosion and damage to stream and river habitats. Similarly, large tracts of old growth rainforest were clearcut, causing significant ecological damage, without the consent of the Nuu-chah-nulth *Ha' wiih*, who carry the traditional responsibility to preside over and protect the Nuu-chah-nulth *Ha' huulthii* (Murray & King, 2012).

However, in 1982 the affirmation of Aboriginal rights and treaty rights within Section 35 of the Canadian Constitution marked an enormous shift in Canadian Law (Harris, 2009). These rights were further strengthened in the seminal *Meares Island Case*, which catalysed a transformation process still underway in Clayoquot Sound (Harris, 2009).

In 1984, a coalition of leaders and residents from Tla-o-qui-aht First Nation and the town of Tofino sought to protect Meares Island, within Clayoquot Sound, from being logged by the MacMillan Bloedel forestry company. The Nuu-chah-nulth Tribal Council claimed the island as part of the traditional territory to which it had Aboriginal title and sought a court injunction against the logging of the island. Subsequently, the logging company requested their own court injunction against the coalition. In an unprecedented decision, the British Columbia Court of Appeal granted the injunction to the Nuu-chah-nulth based on the irreversible damages of unsustainable forestry practices (Harris, 2009). In the words of Justice Seaton,

> "It appears that the area to be logged will be wholly logged. The forest that the Indians know and use will be permanently destroyed. The tree from which the bark was partially stripped in 1642 may be cut down, middens may be destroyed, fish traps damaged and canoe runs despoiled. Finally, the island's symbolic value will be gone. The subject matter of the trial will be destroyed before the rights are decided." (Harris, 2009, p. 149).

The victory of the *Meares Island Case* also marked the beginning of the Tla-o-qui-aht assertion of rights and title to the Meares Island Tribal Park, and an additional 10 years of conflict (Murray & King, 2012). In 1994, in an effort to resolve an escalating environmental campaign, the British Columbia government announced a Scientific Panel for Sustainable Forest Practices in Clayoquot Sound. Through this, the Nuu-chah-nulth principle of *hishuk-ish-ts'awalk* (everything is one and interconnected) inspired a set of new protocols designed to respect both traditional ecological knowledge (TEK) and scientific knowledge systems (Lertzman, 2010). Recommendations of the scientific panel were eventually instituted through watershed management plans that now provide the foundation for adaptive ecosystem management in the region. One plan is in the Indigenous community of Ahousaht, where Chief Maquinna has noted:

> "The Ahousaht believe that this is the beginning of a new era, based on recognition and celebration of Ahousaht people and culture, conservation of the world- class forest and marine resources of Clayoquot Sound, and the development of a more diversified, sustainable local economy, including community forestry." (Maaqutusiis Hahoulthee Stewardship Society, 2017).

A recent challenge concerns the decline of fishing and logging livelihoods over the last decade. On the other hand, employment in nature tourism has rapidly grown, and is now one of the main economic forces for West Coast communities, attracting over one million visitors per year (CBT, 2016). However, several warning signs indicate the steady growth of tourism has potentially exceeded the sustainable capacity of many communities within the Biosphere Reserve. For example, the escalating rise in the number of West Coast visitors is strongly correlated with the increased seasonal demand on emergency medical services, increased summer drought vulnerability, lower average income levels and a reduced supply of long-term affordable housing units (CBT, 2016).

Community initiatives

Today, the principles and protocols established by the scientific panel are embodied in local community

Preparing a traditional Nuu-chah-nulth salmon bake as a surprise gift to visiting students who shared respectful relations with the Yułuʔiłʔatḥ people and Hitacu community. Photo: Cayley Webber

organisations with new governance models based on the shared desire to build a sustainable future on West Coast Vancouver Island. One such example is the Clayoquot Biosphere Trust (CBT), which is led by a voluntary board of directors, representing all local First Nations and communities within the Clayoquot Sound Biosphere Reserve, with a vision:

> "…to live sustainably in a healthy ecosystem with a diversified economy and strong, vibrant and united cultures while embracing the Nuu-chah-nulth First Nations living philosophies of *iisaak*, (living respectfully), *qwa'aak qin teechmis* (life in balance) and **hishuk ish ts'awalk** (all things are connected)" (CBT, 2014a).

In monitoring community development trends using a range of sustainability indicators, CBT raised the above-noted tourism issue. Given the potential negative impacts, local leaders worked to identify ways to diversify tourism livelihoods with elements of the knowledge and sharing economy. A new West Coast learning initiative (Loucks et al., 2015) was started, including (i) an initiative to identify community education needs and priorities, involving local organisations, educational institutions and government agencies; (ii) partnerships between organisations throughout the Biosphere region and between municipal and provincial governments, to align job training priorities; and (iii) leveraging of funds within the region to support an education asset inventory (CBT, 2014b) and research on the feasibility of education tourism to build local learning capacity and develop a visitor market demand for place-based education (Loucks et al., 2015).

In 2016, a collaboration of the CBT, First Nations, municipal governments, local education organisations and destination marketing organisations, launched the West Coast NEST (Nature, Education, Sustainability, Transformation) to connect people to all current learning opportunities offered in the region, focusing on four key market sectors: university field schools; professional development courses; adult learning; and youth learning opportunities.

The vision is to enable all local community members and education-oriented organisations to participate fully in the learning economy, together with visiting learners (Loucks et al., 2015). By linking learning with tourism, the West Coast NEST is creating a global network of learners who can help catalyse a new local economic opportunity, while shifting values towards sustainable livelihoods.

Nested within the Nuu-chah-nulth values of *iisaak*, *qwa'aak qin teechmis* and *hishuk ish ts'awalk*, the education tourism initiative is an opportunity to transform conventional tourism to attract a different type of visitor: one who wants to stay longer on the West Coast, learn from local people, experience local culture and contribute to stewardship of this ecologically significant place.

In this manner, local community organisations are working to shift away from an unsustainable tourist 'consumer' economy and moving incrementally towards a new 'conserver' economy, where broken cultures are restored and damaged SES are re-built. The communities see education tourism as having the potential to support an economic return from visiting learners while expanding local learning opportunities.

Seven principles for education tourism

- Attract co-learners: we welcome others to learn with us.
- Community reciprocity: we share benefits between communities.
- Local knowledge holders are experts: local people are reimbursed for expenses faced in sharing their knowledge.
- Learning networks of practice: together, we are creating a culture of learning and collaborative problem solving.

Nuu-chah-nulth Elder Ray Haipis, from Yułuʔiłʔatḥ territory, instructing visiting university students on how to paddle a traditional Nuu-chah-nulth canoe to navigate harbour currents.
Photo: Cayley Webber

- Stewardship-in-place: every community has an outdoor classroom and a place to learn from the land.
- Holistic hands-on learning: we learn best by applied learning and practice.
- Cultural safety and sharing: we create safe spaces for learning and healing across cultural boundaries.

Practical outcomes

The West Coast learning initiative has demonstrated innovative solutions for sustainable livelihood challenges. As more organisations contribute to education programme development, education initiatives for local and visiting learners increase, resulting in a broader distribution of economic benefits and sustainable livelihood options. In 2017, for example, 75 educational courses and 356 educational events were offered, over 150 temporary work opportunities were created delivering educational courses, and 712 temporary positions were created to deliver educational events. In 2019, these benefits have expanded to include 320 educational courses, 1,032 educational events, 66 seasonal positions and 2,064 temporary positions.

The West Coast NEST motivates both lateral and vertical connectivity across local communities in the region, as well as organisations who share a vision for higher learning and contribute to sustainable economic diversification. Working within the principles and values of a Nuu-chah-nulth worldview helps to guide a regional vision for higher learning while also supporting a shared culture of

place-based stewardship. Likewise, training has been provided for over 40 students of a leadership program, from Nuu-chah-nulth and non-Nuu-chah-nulth communities, who continue to volunteer their time to local community projects.

Local economic development capacity is growing with the following programmes: First Nation Tourism Training certificate, governance training, grant writing workshops, strategic career management training and Critical Incident Stress Management Training in partnership with three First Nations and the Justice Institute of British Columbia.

The measurable benefits from education tourism help to support local municipal government plans and policies to further diversify the tourism economy and invest in sustainable economic development. The town of Tofino, for example, identifies several economic development goals in support of education tourism such as the goal for Tofino to become a centre of excellence in learning, research and development.

In summary, the West Coast NEST is an example of how cross-cultural collaboration, knowledge sharing and place-based learning are integral to transforming SES at the community level. As the number of education opportunities grow, more options for new and innovative forms of sustainable livelihoods naturally unfold, especially when supported by municipal government sustainable economic development initiatives. All these actions, when taken together, help to support the ground swell of social change and transformation underway in the Clayoquot Sound UNESCO Biosphere Reserve.

References

Austin, M.A., Buffet, D.A., Nicholson, D.J., Scudder, G.G.E. and Stevens, V. (eds.) (2008). *Taking Nature's Pulse: The Status of Biodiversity in British Columbia* [online]. Victoria, BC, Canada: Biodiversity BC. Available at: http://www.biodiversitybc.org/EN/main/downloads/tnp-introduction.html

Clayoquot Biosphere Trust (CBT) (2014a). 'Vision'. CBT [website]. Available at: https://clayoquotbiosphere.org/about-us/overview

CBT (2014b). *Regional Education Asset Inventory.* Tofino, BC, Canada: Clayoquot Biosphere Trust. Available at: https://clayoquotbiosphere.org/files/file/5d6f46b85bb19/Regional-Education-Asset-Inventory_final.pdf

CBT (2016). *Clayoquot Sound Biosphere Region's Vital Signs 2016.* Tofino, BC, Canada: Clayoquot Biosphere Trust. Available at: https://clayoquotbiosphere.org/research/vital-signs

Harris, D. (2009). 'A Court Between: Aboriginal and Treaty Rights in the British Columbia Court of Appeal'. *BC Studies*162 (Summer): 137–152. Available at: https://commons.allard.ubc.ca/cgi/viewcontent.cgi?article=1181&context=fac_pubs

Lertzman, D.A. (2010). 'Best of two worlds: Traditional Ecological Knowledge and Western Science in Ecosystem based Management'. *Discussion Paper. BC Journal of Ecosystems and Management* 10(3): 104–126. Available at: https://jem-online.org/index.php/jem/article/download/40/12

Loucks, L., Thicke, C., Bird, G., White, B. and Harris, R. (2015). *Education Tourism Market Development Strategy for the Pacific Rim Knowledge Initiative.* Royal Roads University, Sooke, BC. Available at: https://clayoquotbiosphere.org/files/file/5d6f46888bfc9/2015-Pacific-Rim-Education-Tourism-Market-Development-Strategy.pdf

Maaqutusiis Hahoulthee Stewardship Society (2017). *Ahousaht Land Use Vision.* Press Release, 25 January 2017. Available at: http://www.mhssahousaht.ca/news/press-release-ahousaht-land-use-vision

Murray, G. and King, L. (2012). 'First Nations Values in Protected Area Governance: Tla-o-qui-aht Tribal Parks and Pacific Rim National Park Reserve'. *Human Ecology* 40: 385–395. Available at: https://doi.org/10.1007/s10745-012-9495-2

United Nations Educational, Scientific and Cultural Organization (UNESCO) (2017). Final Report of the Twenty-ninth session of the International Co-ordinating Council (ICC) of the Man and the Biosphere (MAB) Programme. Paris, France, 12–15 June (2017). Available at: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/images/FINAL_29MAB_ICC_REPORT_ENG.pdf

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