

TBTI GLOBAL BOOK SERIES



DRIED FISH MATTERS

EXPLORING THE SOCIAL ECONOMY
OF DRIED FISH

EDITORS

Eric Thrift, Madu Galappaththi, Raktima Ghosh,
Derek S. Johnson, Wae Win Khaing, Mahfuzar Rahman, and
Ratana Chuenpagdee

Dried Fish Matters

*Exploring the Social Economy of
Dried Fish*

edited by

Eric Thrift, Madu Galappaththi, Raktima Ghosh,
Derek S. Johnson, Wae Win Khaing, Mahfuzar
Rahman, and Ratana Chuenpagdee

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Too Big To Ignore Global (TBTI; toobigtoignore.net) is a research network and knowledge mobilization partnership supported by over 800 members from around the world. The network aims at elevating the profile of small-scale fisheries, arguing against their marginalization in national and international policies, and developing research and governance capacity to address global fisheries challenges.

TBTI Global Book Series is a publication series that aims to highlight why we need to pay close attention to small-scale fisheries. The series will be of use to anyone interested in learning more about small-scale fisheries, especially about their important contribution to livelihoods, well-being, poverty alleviation and food security, as well as to those who are keen to help raise profile of small-scale fisheries in the policy realm.

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We dedicate this volume to the memory of our friend and collaborator, Professor Mostafa Reza Ali Hossain (Ranu), 1967-2023. Mostafa is a much missed source of inspiration, knowledge, and companionship for the DFM team.



Photo by Md. Nahiduzzaman

Contents

<i>Foreword</i>	v
<i>Preface</i>	vii

I Introducing Dried Fish

1. Transforming Values: Reflections on How Dried Fish Takes Value Socially
Derek S. Johnson 3
2. Why, How, and to Whom Dried Fish Matters: A Conversation among Researchers
Anupama Adikar, Ben Belton, Mostafa Hossain, Gayathri Lokuge, Tara Nair, Sisir Pradhan & Shalika Wickrama 21

II Food, Life, and Stories

- Introduction** – A Narrative of Many Narratives
Raktima Ghosh 35
3. Malini Peramuna: Life History of a Maldivian Fish Processor and Producer Association Leader
Dilanthi Korlagama & Nireka Weeratunge 44
 4. All about ‘Kapi’
Ratana Chuenpagdee, Suphakarn Traesupap, Suvaluck Satumanatpan, Thammasak Yeemin & Kungwan Juntarashote 53
 5. Local Stories of the Global Anthropocene: A One-day ‘Adda’ with the Dry-Fishers of the Sundarbans Delta
Raktima Ghosh & Jenia Mukherjee 64
 6. Residing with Risks: Everyday Narrative of a Woman at Dried Fish Practice in the Indian Sundarbans
Souradip Pathak 78

7. Dried Queenfish with Coconut Milk <i>Dilanthi Korlagama & H N D Hettiarachchi</i>	83
8. Trawling the Shutki Tidalectics: Short Narratives from Dry-fishing Women Folk in Frasergunj, India <i>Shreyashi Bhattacharya & Anuradha Choudry</i>	88
9. Tales from the Sea: Rendevoez with Vishnu Bhaliya, Jafrabad, Gujarat <i>Tara Nair & Durga C. Fofandi</i>	90
10. Grandmother's Recipe <i>Sai Leela Modem</i>	95
11. Dawn to Dusk: A Day in the Life of a Dry Fish Vendor <i>Sai Leela Modem</i>	101
12. A Woman in a Strange Place <i>Wae Win Khaing</i>	111
13. Davla and Dried Shrimps <i>Parag Tandel & Sara Ahmed</i>	117
14. The Story of Maimul: Locating Marginalization and Discrimination of the Fishing Community in Sylhet, Bangladesh <i>Yeashir Arafath & Mirza Taslima Sultana</i>	120

III Describing Dried Fish Value Chains

Introduction: The Diverse Values of Dried Fish Across Value Chains <i>Madu Galappaththi</i>	137
15. Maldive Fish Processing in Southern Sri Lanka <i>Anupama Adikary & Dilanthi Korlagama</i>	141
16. Fish Fermentation in the Floodplain: A Photo Essay <i>Mostafa A. R. Hossain, Ben Belton & Shakuntala H. Thilsted</i>	166
17. Coastal and Inland Dried Fish Value Chains in Sri Lanka: A Photo Essay Exploring the Processing Node and its Linkages <i>Madu Galappaththi, Wedige Chathurika Hiroshini, R. Ishan Indunil, Lakshitha Fernando, Sachindu Weththasinghe, Ishan Weththasinghe, Sachini Bandara Menike & Thusharini Renganathan</i>	178

18. Dried Small Indigenous Fish are the Pride of Assam:
The Story of Suman Haldar
Sourabh Kumar Dubey, Kalpajit Gogoi & Ben Belton 202
19. Shopping for Dried Fish: A Photo Essay Portraying the
Varieties of Dried Fish Products in Thailand
*Kongpop Rungruengrayup, Piyanuch Rungrattanapongporn,
Suphakarn Traesupap, Suvaluck Satumanatpan, Thammasak
Yeemin, Kungwan Juntarashote & Ratana Chuenpagdee* 208
20. Living on the Edge: Experiences of Women Fish Processors
and Traders in Coastal Northern Andhra Pradesh, India
Venkatesh Salagrama & Arjilli Dasu 220
21. Dried Fish Consumption in Myanmar
Sithu Lin, Wae Win Khaing & Ben Belton 232
22. India's Fish and Dried Fish Trade: An Overview
Jeena T. Srinivasan 252
23. Online Marketing and E-commerce of Dried Fish in Thailand
Nova Almine & Ratana Chuenpagdee 268
24. From the Neoclassical Economic to the Social-Ecological System
Perspective: A Novel Outlook on Dried Fish Value Chains
Sisir Kanta Pradhan, Prateep Kumar Nayak & Derek Armitage 282
25. Examining Value from a Socio-cultural Perspective
Md. Mahfuzar Rahman 308
26. Navigating Weights and Measurements in the Dried Fish
Supply Chain
*Amalendu Jyotishi, Prashanth Ramappa, Prasanna Surathkal,
Ramachandra Bhatta, Holly M. Hapke & Nikita Gopal* 328
27. Dried Fish as Sustainable Gastronomy: A Semantic Analysis
of Ræstur Fiskur
Eric Thrift 354

IV Co-learning

- Introduction:** Reflections on Knowledge Co-construction in the DFM
Project
Eric Thrift 411
28. Tastes and Smells of Dried Fish
*Gayathri Lokuge, Madu Galappaththi, Mostafa Hossain,
Nikita Gopa & Eric Thrift* 415

29. Dried Fish Stories: Reflections on Visualizing Social Economies of Dried Fish in the Time of COVID <i>Nireka Weeratunge & Eric Thrift</i>	424
30. Computer-assisted Research and the Construction of a 'Dried Fish Literature' <i>Eric Thrift, Derek S. Johnson, Ben Belton & Jonah Olsen</i>	437
31. Researching the Researchers: A Study of Communication Effectiveness in an International Project <i>Alexia Pigeault & Fabiana Li</i>	469
Synthesis: Learning about Dried Fish <i>Eric Thrift & Derek S. Johnson</i>	480
List of Authors	496

Foreword

Since the launch of our first e-book in 2019, we knew that the TBTI Global Publication Series would become a key source of knowledge and stories about small-scale fisheries. We enjoy working on these books, with each of them bringing something new and unique to the dialogues around small-scale fisheries. Each book has its own beginning, and a purpose, which is always interesting when revealed.

'Dried Fish Matters: Exploring the Social economy of Dried Fish' edited by Eric Thrift, Madu Galappaththi, Raktima Ghosh, Derek S. Johnson, Wae Win Khaing, Mahfuzar Rahman, and Ratana Chuenpagdee is the first book to provide a systematic reflection on the social economy of dried fish. The volume is methodologically and conceptually innovative as is demonstrated by its final section that reflects on the process of knowledge co-production in making of the book and in the larger project, 'Dried Fish Matters: Mapping the social Economy of dried fish in South and Southeast Asia for enhanced wellbeing and nutrition' (DFM). DFM is funded by the Social Sciences and Humanities Research Council of Canada, headquartered at the University of Manitoba, Winnipeg, led by Professor Derek Johnson, in collaboration with over 50 researchers and practitioners from more than 20 institutions and organizations in South and Southeast Asia. The focus of the project on dried fish value chain makes it stand out from other work that we have seen, which is mostly related to fisheries and fishing communities, but not about fish processing and trading, or the people involved in the post-harvest. Even though we are interested in fish as food, and recognize its nutritious value, we have not paid sufficient attention to the fact that fish are not always consumed fresh, and that the social economy of dried fish is vastly different from those of other products.

The idea for the book and subsequent discussions about it arose in the middle of DFM’s eight-year long project period as researchers were beginning to share exciting findings and unusual insights about the social economy of dried fish and the lives of the people working in the value chain. In order to do justice to the work, it has to be widely, and differently, disseminated. The e-book is a good option, although not complete, as it is not able to capture all the senses of the dried fish, which turn out to be one of the most interesting aspects of the research. Still, as we read the stories and the recipes, it is possible to imagine the sound of the women selling dried fish from door-to-door or the smell of the dishes that are being prepared. But then we learn, through the photo essays and other narratives, that lives of the people involved in dried fish are often hard, and we are left wondering what can be done to improve their wellbeing.

The book does an excellent job at convincing us why ‘Dried Fish Matters’. We are waiting enthusiastically for a call to join a ‘Dried Fish Movement’, which is a natural next step.

Ratana Chuenpagdee

TBTI Global Director

Bangkok, Thailand

August 3, 2023

Preface

Dried fish accounts for one-quarter to one-third of all fish consumed in South and Southeast Asia. Often produced simply by placing fish on the ground to dry in the sun, fish may also be processed through a combination of several other preservation technologies – salting, fermenting, brining, smoking, and pickling – using racks, ovens, clay pots, or other equipment. This book explores *dried fish* in the broadest possible sense, as encompassing any fish product that is neither fresh nor frozen. The main feature of these products is their portability: without the need for a cold chain, the food becomes less expensive to store and transport, and therefore more accessible to consumers in remote or less affluent places.

The present volume is an outcome of the Dried Fish Matters Partnership, a research initiative funded by the Social Sciences and Humanities Research Council of Canada. Including more than 20 member organizations, this partnership is driven by researchers and students located in Canada, India, Bangladesh, Sri Lanka, Myanmar, Thailand, and Cambodia. The overall goal of Dried Fish Matters has been to study the contribution of dried fish to the food and nutrition security and livelihoods of the poor, and to examine how production, exchange and consumption of dried fish may be improved to enhance the well-being of marginalized groups and actors in the dried fish economy. The research outputs of this partnership have included reports and working papers, journal articles, conference presentations, and graduate student theses (see <https://driedfishmatters.org/pub/publications.html>).

The editors of the present volume share an interest in public and visual research outputs. Our prior works within Dried Fish Matters have included a series of short videos prepared for World Fisheries Day in 2021, and a collectively authored video essay entitled ‘Visualizing social economies: Dried

fish stories from Asia' (discussed in Chapter 34, this volume). Inspired by the creative opportunities afforded by these small works, and encouraged by their potential for accessibility to community collaborators and the general public, we resolved to put together this e-book as a creative experiment in public scholarship. We conceived this publication as an edited volume that might present findings generated through rigorous research, but that could also expose the processes leading up to those findings, and that could include the voices of our collaborators. We aimed to accommodate essays that might be theory-driven or analytical, while leaving ample space for contributions that were expressive or reflexive.

This e-book aligns with the spirit of World Gastronomy Day in that it intends to celebrate the dried fish as a food that is deeply 'gastronomical' – in the sense of being embedded in cultural life and foodways – while also vitally linked to sustainable development. A total of 32 contributions are grouped into four main thematic sections. Under the heading of 'Introducing dried fish', we offer two introductory framings for dried fish. Derek Johnson, Project Director of Dried Fish Matters, first provides an introduction to social value associated with dried fish from an anthropological perspective (Chapter 1). This is followed by the transcript of a panel discussion among six members of the Dried Fish Matters Partnership from India, Sri Lanka, and Bangladesh, who were prompted to discuss the importance of dried fish to themselves – both as researchers and as consumers – and to the communities in which they work (Chapter 2).

The section 'Food, life, and stories' brings together recipes, photo essays, life histories, and interviews that capture interactions between researchers and their community collaborators. Most chapters in this section report on the experiences of women who process and sell dried fish: contributions include the life history of a Maldivian fish processor and producer association leader in Sri Lanka (Chapter 3); the report of a one-day 'adda' meeting with fish processors of the Sundarbans Delta (Chapter 5) and a story capturing the everyday life of one of the fish processors there (Chapter 6); a brief vignette describing fish processors in Frasergunj, India (Chapter 8); a day in the life of a dried fish vendor in Visakhapatnam, India (Chapter 11); and a portrait of

a dried fish processor and retailer in Myanmar (Chapter 12). The activities of retailers and consumers are communicated in an essay on the trade in *kapi* fermented krill paste in Thailand (chapter 4), while the final chapter in this section discusses the marginalization of ‘Maimul’ communities who produce dried fish in Bangladesh (Chapter 14). This section also includes three recipes: one for dried queenfish with coconut milk from Sri Lanka (Chapter 7), another for a stir fry from India, presented as a ‘grandmother’s recipe’ (Chapter 10), and a third for curried dried shrimp cooked with *davla*, a local shrub that grows in the salt marshes of Western India (Chapter 13). Finally, the importance of fishing and fish drying in art and literature is represented through a conversation and literary extract from Vishnu Bhaliya, a fisher and dried fish processor who is also the author of short stories and novels (Chapter 9).

The section ‘Describing dried fish value chains’, the largest in this book, includes two sets of contributions – a first group of chapters that describe dried fish value chains and how they operate; and a second group of chapters that explore different ways of theorizing or interpreting *value*. These chapters amplify the fieldnotes and stories from the previous section, describing in a more general and systematic way the experiences of fish processors, traders, and consumers in Sri Lanka (Chapter 16), Assam and Andhra Pradesh in India (Chapters 18 and 20), and Myanmar (Chapter 21), or presenting an overview of India’s dried fish economy (Chapter 22). The section also includes photo essays on fish fermentation in Bangladesh (Chapter 16), coastal and inland fish drying in Sri Lanka (Chapter 17), and products for sale in Thailand (Chapter 19), the latter of which is matched to an essay on the shift to online shopping for dried fish in Thailand (Chapter 23). In the second, more theoretical cluster of chapters in this section, contributors offer four distinct ways of thinking about ‘value’ in dried fish value chains. The authors of these chapters invite us to consider how dried fish embodies ecological value, as modelled by social-ecological systems analysis (Chapter 24); socio-cultural value, as described by economic anthropology (Chapter 25); market value, as measured and negotiated with reference to customary weights and measures (Chapter 26); or gastronomic value, as created through association of dried fish with

gastronomy discourse (Chapter 27).

Finally, the ‘co-learning’ section of this volume takes a reflexive approach to the process of conceptualizing, researching, and describing dried fish value chains, highlighting the collaborative and social nature of the work presented in this book. The chapters in this section include comments from the researchers themselves on why dried fish matters to them and their own communities (Chapter 28), a reflection on our efforts to use digital storyboards to visualize social economies of dried fish during the COVID-19 pandemic (Chapter 29), an essay on how software tools shaped our strategies for defining and surveying the literature on ‘dried fish’ (Chapter 30), and a summary of findings from a study of communication effectiveness within the Dried Fish Matters project itself (Chapter 31). The various themes presented throughout this book are connected in greater depth in our final, synthesis chapter that summarizes our learning about dried fish (Chapter 32).

A work of this type would not be possible without the support of many people. We thank all chapter authors and peer reviewers, as well as the members of the editorial committee: Eric Thrift, Madu Galappaththi, Ratana Chuenpagdee, Raktima Ghosh, Wae Win Khaing, Mahfuzar Rahman, and Derek Johnson. Eric Thrift and Kevin Edbert managed editorial communications for Dried Fish Matters. Vesna Kereži coordinated copy-editing and design, with guidance from Ratana Chuenpagdee and financial support from TBTI Global. The cover images were produced by Sarangi Rathnayaka of Sar-G Design Studio, Bandarawela, Sri Lanka. This work was supported by the Social Sciences and Humanities Research Council of Canada (SSHRC) under the Partnership Grants program (project number 895-2018-1017). The lead institution for the project is the University of Manitoba.

Eric Thrift

University of Winnipeg

Winnipeg, Canada

August 3, 2023

I

Introducing Dried Fish

1. Transforming Values: Reflections on How Dried Fish Takes Value Socially

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Introduction

In this essay I reflect on how dried fish, the object at the heart of the *Dried Fish Matters* (DFM) project, can be much more than immediately meets the eye. I make my argument with reference to examples drawn from my personal experience, this volume, and elsewhere. I reflect on the place of dried fish in the lives of participants in dried fish value chains, including importantly the ways in which dried fish has meaning for them.

My frame of reference in this chapter is economic anthropology, an approach that broadens the idea of economy to include cultural, historical, political, psychological, social relational, and environmental factors as essential to shaping human behavior in production, exchange, and consumption (Graeber 2001; Rahman: Ch. 25, this volume). Where neo-classical economic models seek to generalize based on an assumed universal cost-benefit calculus of human behaviour, economic anthropology is interested in the contextually specific ways in which people engage in economic activity. The difference between these contrasting perspectives on economy is evident in their approaches to value. In a neo-classical economic approach, the imperative

of generalization is achieved through understanding value as measurable and convertible through the metric of money. Economic anthropology, in contrast, emphasizes the situational quality of value. Economic choices and transactions only make full sense in relation to their broader contexts.

Value stands for the learned orientations that shape how we see the world (held values) and the evaluations we make of aspects of our world (assigned values) (Masiero et al. 2019, p. 172). Economic anthropology argues that the values we hold, and assign, create worlds the depth, complexity, and meaning of which is lost through the simplification of the money metric. In contrast to the assumed reducibility of value to money, economic anthropology includes the possibility of intrinsic and use-values where values are incommensurable with each other. These ideas align with heterodox economics and political economy, along with the importance of related questions about whose interests are served, and whose interests obscured, by a focus on monetary value.

From an economic anthropology perspective, dried fish are a thing through which we can see much bigger, yet contextually specific, human relations, meanings, stories, and conflicts. Dried fish are more than just an edible commodity assigned monetary value through market exchange, though they are that too. Dried fish can be seen as the reference point from which many kinds of value emerge. These diverse values of dried fish reflect, equally, factors that make economic behaviour, decision making, and choice contextually and temporally specific (Johnson et al. 2018). I give an indicative list of some of the values that dried fish represent in Table 1. These values should be seen as interlinked rather than discrete and as subject to a range of evaluations from negative to positive. The complex ways in which feelings about dried fish shape perception and behaviour makes dried fish a powerful lens through which to view economic subjectivity and relations.

1. TRANSFORMING VALUES: REFLECTIONS ON HOW DRIED FISH TAKES...

Table 1. Some of the diverse values of dried fish

Value	Illustration
Monetary	Dried fish as commodity (Srinivasan: Ch. 22) and economic opportunity (Arafath & Taslima: Ch. 14)
Social	Dried fish as gift to connect or as marker of social difference (Lokuge et al.: Ch. 28)
Cultural	Dried fish dishes as culinary heritage (Thrft: Chapter 27; recipes, this volume) or as low status common food
Spatial	Dried fish as geographically specific products (Figure 1, this chapter; Ch. 22)
Emotional	Dried fish as desire or as disgust (this chapter; Lokuge et al.: Ch. 28)
Sensorial	Dried fish as aesthetically pleasing (images, this volume) and tasty (Thrft: Ch. 27; Lokuge et al.: Ch. 28; recipes, this volume)
Political	Dried fish, power, and patriarchy (Salagrama & Dasu: Ch. 20; Khaing: Ch. 12)
Ecological	Dried fish as indicator of vulnerability (Pathak: Ch. 6; Ghosh & Mukherjee: Ch. 8; Nair & Fofandi: Ch. 9) or as consumption smoothing mechanism (Belton et al. 2022)

I use the idea of transformation to think about the many possibilities of human creativity and diversity that dried fish represent. I elaborate three ideas to illustrate this sense of transformation. First, I look at consumption as how individuals transform dried fish into personal meaning within the contexts and experiences of their lives. Second, I reflect on how dried fish processing transforms values. Processing adds more than monetary value. Third, I think about how change shapes, and is shaped by, human actors as they transform the value of dried fish according to their varied and conflicting intentions. Transformation is important, in other words, as it brings time and agency to the economic anthropology of dried fish.

Consumption as transformation

Consumption is a deeply personal activity, particularly in the matter of food. We consume the foods that we like and to which we are accustomed through the ways in which we have been raised. In this sense, food is a profoundly cultural marker of identity. At the same time, however, identities as revealed through food are not fixed. We can deliberately make and remake our identities over the course of our lives through choices in the kinds of food we eat. How dried fish fits into individual patterns of food consumption is thus a blend of socialization, personal history, and choice. This mixture of habit and agency offer possibilities for personal transformation, but transformation

that is undertaken in social context.

I elaborate this idea first through my own experience. Consumption is deeply personal, so is an area where recognizing our own humanness brings an important sense of connection and immediacy to otherwise more hands-off academic analysis.

On the surface, I come from a predominantly English cultural background where dried fish has little place, at least in recent generations. However, my personal history has given me a strong affinity for dried fish. This is in part the legacy of a father with adventurous gastronomic tastes but even more the effect of early childhood years spent in Hong Kong where dried fish was an integral part of the flavour palette of the Cantonese and Hakka foods that I ate. I can't help but salivate at the thought of the shreds of the salted fermented fish paste (*hahm yu*) used as a general purpose condiment or added as a key flavouring of steamed savoury meat cakes (*yuhk behng*). But most vivid are my memories of the stringy chewy umami delight of dried squid snacks that I would get when I went to the shops or market with my mother. The flavour of dried squid still calls up the wonderful smells of street food vendors' stalls and the bustle, colour, and noise of the streets of Tsuen Wan where we lived. More recently, my delight at dried squid was accentuated with my discovery that my young son also loves it.

1. TRANSFORMING VALUES: REFLECTIONS ON HOW DRIED FISH TAKES...



Figure 1. High end Japanese dried squid for sale in Hong Kong Airport. Credit: Derek Johnson, 2018

Dried fish is thus a part of me in memory, in body, and even in my children (though my daughter dislikes it viscerally). It is a valued counter point to the very different, and sometimes also delicious, dishes of my English ancestors or the Canadian culinary mainstays of my post-Hong Kong upbringing.

This predisposition to dried fish thus has heightened my awareness of dried fish as a food item. During my Master's research on fisheries in Eastern Canada in the early 1990s I was struck by the persistence of dried cod in local diets even at a time when cod was scarce due to overfishing and prices of dried cod were high. During my PhD research in Gujarat in the late 1990s, I was fascinated by the highly distinctive social economy of dried fish that was the basis for the fishery a little further down the coast from where I was conducting research on a fresh fish oriented fishery. I have since pursued this interest in dried fish in Gujarat vicariously through my master's student Rajib Biswal (e.g. Biswal et al. 2017; Biswal & Johnson 2023) and the work of the DFM Gujarat team (e.g. Nair & Baxi 2022). Dried fish has been one of the signposts marking important moments of choice and change in my life.

Let me now go to the other extreme of scale when thinking about

DRIED FISH MATTERS

consumption and choice. One point that research in DFM has accentuated is a macro-observation about dried fish consumption in Asia. There is a broad boundary zone between South and Southeast Asia in Bangladesh, northeastern India, and Myanmar where there is a fundamental shift in consumption by product type. To the west of this transition zone, dried fish are consumed primarily in dried and salt dried forms. To the east, they are consumed primarily in fermented forms. This distinction, illustrated in Figure 2, became obvious in a recent effort by members of Dried Fish Matters to analyze the published global literature on dried fish (Belton et al. 2022).

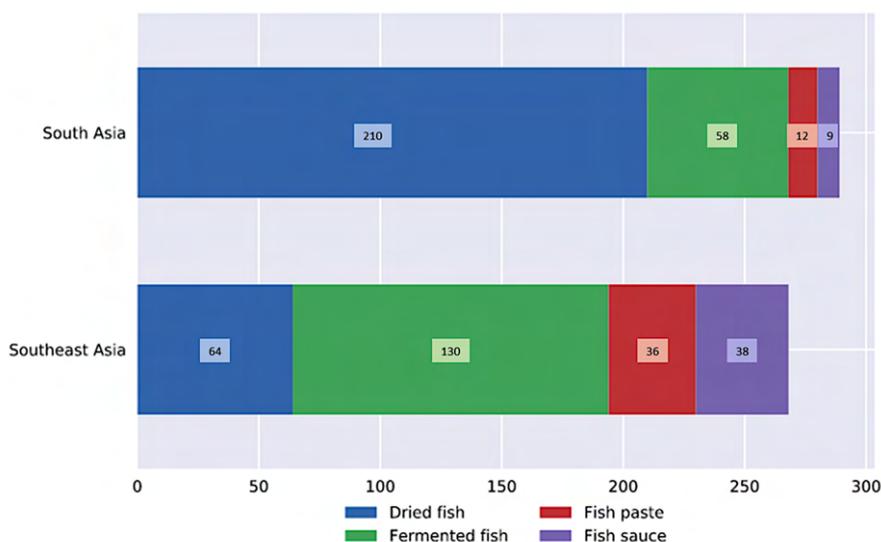


Figure 2. Relative frequency of occurrence of product type category tags within two geographic subsets of the sample used in our dried fish literature survey (Belton et al. 2022). Each publication in the sample was manually assigned tags identifying zero or more products explicitly discussed in the publication text. Bars represent a stacked percentage of all product tags within each subset.

Figure 2 shows that the large majority of focus product types in the literature on dried fish in South Asia concern the specific category of dried fish. In

1. TRANSFORMING VALUES: REFLECTIONS ON HOW DRIED FISH TAKES...

Southeast Asia, most of the product type mentions in the dried fish literature are of fermented fish and the related fermented fish products of fish sauce and fish paste. Dried fish exist in Southeast Asia and are a minority area of research. In South Asia, mentions of fermented fish, fish sauce and fish paste are largely in literature from the Indian northeast and Bangladesh, precisely the transition zone area between the two regions. The distinction of Southeast Asia from South Asia is in fact not just regional, but also global: Southeast Asia is the world's center for the production of fermented fish and an anomaly in its focus on that product type. As the studies in this volume show, there is a rich array of micro-variation in dried fish consumption at smaller scales. For example, as Koralagamage et al. note, in Sri Lanka there is a marked local preference for dried flaked tuna (Chapter 15: Maldivian fish). In Bangladesh and Myanmar, as the chapters by Hossain et al. (Chapter 16) and Lin et al. (Chapter 21) show, there are striking regional variations in preference for dried fish and for different dried fish products. The cultural texture of dried fish variation is evident in the diversity of names for dried fish products as illustrated in Table 2.

The observation of such differences raises fascinating *why* questions to account for this variability in consumption preference. One classic cultural ecology argument for the prevalence of fermented fish products in Southeast Asia is given by Ruddle and Ishige (2010) who argue that the environmental conditions of Southeast Asia predispose the production of fermented fish. Preference, however, should not be ascribed to environmental factors alone – local histories, social differences, migration, technology, cultural proscriptions such as period fasting are examples of the factors that shape what kinds of fish are consumed where, when, and how.

DRIED FISH MATTERS

Table 2. Examples of names of dried fish product types in South and Southeast Asia. Collated by Madu Galappaththi

Country	Product type	Local term	Processing method
Sri Lanka	Dried fish	Karawala (Sinhala)	Salted and sun dried
	Dried anchovies	Hal messo (Sinhala), Neththili (Tamil)	Salted and sun dried
	Maldive fish	Umbalakada (used as a flavouring ingredient)	Boiled, smoked, and sun dried
	Fermented fish	Jaadi	Fermented in salt
	Smoked fish	Dum karawala	Smoked freshwater fish
India	Dried Bombay duck	Bumla (Gujarati), Bombil (Marathi), Bomla (Bengali)	Sun dried
	Dried fish	Suki machhi (Gujarati)	Salted and sun dried
	Dried shrimp	Jawla (Gujarati); Kucho chingri (Bengali)	Sun dried
	Smoked fish	Archina chepalu (Telugu)	Smoked
	Dried cartilaginous fish (e.g., rays and sharks)	Shankar Machh (Bengali)	Salted and sun dried
Bangladesh	Fermented fish	Chapa or Shidhol	Semi-dried and fermented
	Dried Fish	Shutki	Salted and sun dried
Thailand	Shrimp paste	Kapi	Fermented
	Dried anchovies	Pla katak	Sun dried
	Dried squid and shrimp	Pla mueg and Kung haeng	Sun dried
	Flavored crispy anchovies	Pla katak song krueng	Dried, deep fried and favoured (e.g., herbal, spicy, sesame)
	Tiny dried anchovies	Pla khao san	Sun dried and air-fried
Cambodia	Fish paste	Prahoc	Crushed, salted, and fermented
	Shrimp paste	Kappik	Fermented
	Fermented Shrimp	Yahe	Fermented
	Fish sauce	Tuk Trey and Tud Trey	Fish sauce – aged and non-aged
	Dried fish	Trey ngeat	Salted and sun dried
	Smoked fish	Trey cha'eur	Smoked
Myanmar	Fish and shrimp paste	Nga-pi and Myin-nga-pi	Fermented
	Dried fish	Nga-chauk	Salted and sun dried
	Dried shrimp	Pa-zun-chauk	Dried whole shrimp or in powder form
	Smoked fish	Nga-jat-taik	Smoked freshwater or farmed fish
	Fermented fish	Nga-pi-kaung	Salted and fermented whole fish
	Fish sauce	Ngan-pyar-yay	Liquid produced during fish fermentation

Processing as transformation: Outputs and inputs

As a product, dried fish are objects that embody transformation. Specifically, dried fish processing converts the ecosystem value of a living aquatic being into values of direct interest to human users. In this sense dried fish processing is an act of changing value, not just adding value. In the remainder

1. TRANSFORMING VALUES: REFLECTIONS ON HOW DRIED FISH TAKES...

of this section, I broaden the idea of value addition to encompass some of the diversity of values that processing creates in dried fish. I see that diversity of values as representing different desirable *outputs* from the material changes of processing. I pay particular attention to the distinction between commodity and non-commodity values and the interplay between these two ways of measuring value. I then briefly reverse perspective and reflect on dried fish as a product that embodies labour value *inputs*.

Value addition in value chain analysis stands normally for a measurement of the monetary, or commodity, value that productive activity creates in a product or service (Pradhan et al. 2022). This is an important way of thinking about value in economic terms and leads to recommendations for how to increase economic benefits in aggregate through efficiencies in production and distribution or for specific groups of actors across the value chain for the purpose of greater equity. In dried fish value chains, value addition is commonly suggested via technological interventions to improve product quality or reduce waste and loss (Belton et al. 2022).

An economic anthropology perspective broadens the scope of value addition. It directs attention to how transformation achieves obvious benefits that should not be measured in monetary terms alone. The drying of fish leads to a material transformation that dramatically increases storability, reduces weight, concentrates nutrients, and allows for the easier transport of this food product across space. These transformed qualities of processed fish do create substantial commodity-based possibilities for trade and profit, but they also allow for other benefits that can be understood to meet broader economic, health, and cultural values. Economic anthropology argues that monetary value cannot and should not perfectly align these different kinds of value as a mainstream economic approach would argue. The commonly low prices of dried fish, in other words, should not be taken as the full expression of their value in cultural, environmental, or nutritional terms. The policy implication of this point is that institutional mechanisms to preserve poor consumers' accessibility to low-cost dried fish while supporting the quality improvement of these products are justified from a broader social valuation perspective.

Dried fish processing increases opportunities for people to make a living in the environments in which they live. A fundamental way dried fish processing does so is to enable delaying returns on productive activity. Fish drying allows a highly nutritious food product that would otherwise spoil within a matter of hours to be retained for use days or months later. In a tropical context of heat and seasonality of precipitation and aquatic species availability, appropriate techniques of fish processing are doubly important. The delayed return logic underpins fish drying at all scales from household-level prahok production in Cambodia (Lokuge et al. 2023) to the large-scale trade in dried fish from India to Bangladesh (Srinivasan: Ch. 22, this volume) or Thailand to Sri Lanka. Food consumption can thus be smoothed over a much longer period of time, creating greater confidence in household and community food and nutrition security. Fish drying, in other words, reminds us that economic activity should also be seen as enhancing the capacity of human populations to flourish. The opportunity for exchange that dried fish creates also raises the possibility of strengthening relations among groups through gifting, exchange, or trade. Anthropology has long pointed out how trade relations as an economic activity are often coupled with other benefits of interaction that may complement or supersede the strict economic reasons for trade (Malinowski 1922). Trade, in this sense of a basis for building and maintaining social networks can be seen as a collectivity enhancing activity rather than a zero-sum game aimed at profit maximization.

The cultural values afforded by dried fish processing link back to the discussion of consumption in the previous section. Dried fish products do more than just meet the utilitarian needs of furthering human viability by extending product life. Dried fish products also contribute to culinary diversity. They enrich human life by appealing to our sense of taste while also fostering the creative possibilities of cooking and the shared experience of savoring tasty food together. In short, they enhance commensality (Lokuge et al.: Ch. 28, this volume).

My mention of cooking allows me to turn to a final point for this section. So far, I have talked about how dried fish processing facilitates certain beneficial outputs. Dried fish, however, are also produced by the input of

1. TRANSFORMING VALUES: REFLECTIONS ON HOW DRIED FISH TAKES...

human labour. For economic anthropology, labour should not be seen as just a commodifiable element of the production process even if in many contemporary dried fish processing yards, it may indeed be reduced primarily to that.

Small-scale dried fish processing can be seen as the first preparatory step in cooking. Drying, smoking, or fermenting fish change the material quality of the meat that may make it partially or fully edible. High heat smoking of fish, for example, acts to delay spoilage directly by cooking it. My point here, however, is not about the chemical changes of fish of fish drying, but the deliberate action of using human labour time to transform fish from the raw to the preserved state. Most common and most evident in small-scale fish processing is that work time invested in fish drying can include relational and emotional components Small-scale fish drying in places like Cambodia, for example, can be an activity practiced in multi-generational family groups using traditional recipes (Lokuge et al. 2023). As such, the fish produced have a meaning to them beyond just subsistence or petty commerce. They may embody pride, love, inter-generational knowledge sharing and solidarity, or attachment to place (Modem: Ch. 11, this volume). In a capitalist economy, of course, such values also have the potential to be commercialized through efforts to associate dried fish products with heritage or familial intimacy. Despite this risk, and even in awareness of it, it is important to recognize that dried fish embody cultural and social relational values that people may impart into them through small-scale collective craftwork, or read into them because of place-based and historical contexts within which such productive activities are widely known.



Figure 3. Artfully arranged dried fish at Orussey Market, Phnom Penh. Credit. D. Johnson, 2019

Change as creative and contested transformation

The preceding point about the complex relationship between commodity and intrinsic values indicates that the value of dried fish changes across time and space. Transformation of the values of dried fish is driven by human creative agency that may deliberately or inadvertently further the interests of particular individuals or groups and lead to contestation.

Illustrations of this situated and contested quality to the valuation of dried fish are evident throughout the Dried Fish Matters project findings and other sources as well. There are numerous indications within the DFM project of changing contexts that show the shifting possibilities for dried fish value creation. To continue the Cambodia example above, for example, DFM research in Cambodia shows a widespread decline in small-scale family-based processing of the staple fermented fish product prahoc due to broader economic and ecological changes in Cambodia. Older Cambodians see this shift to a more commodity-based provision of prahoc for Cambodian households as a significant cultural loss, but younger Cambodians view the

1. TRANSFORMING VALUES: REFLECTIONS ON HOW DRIED FISH TAKES...

transition with greater indifference (Lokuge et al. 2023). In Bangladesh and Thailand, and probably elsewhere as well, one effect of the COVID-19 pandemic has been the rapid spread of internet-based marketing of dried fish (e.g. Almine & Chuenpagdee: Ch. 23). Here too there is likely an inter-generational transition taking place as younger traders and consumers transform the ways in which this ancient product is appreciated and accessed. In Bangladesh, the shift to internet-based marketing is facilitating an articulation of dried fish with newer commodity values, as represented for example by organic labelling.



Figure 4. Organic dried fish, Cox's Bazar, Bangladesh. Credit: D. Johnson, 2019

These examples suggest intergenerational difference as one important way that people might contest change. Contrasting types of dried fish products destined for different uses are another obvious point of contestation. In the Indian context, DFM research in Karnataka (Surathkal et al. 2023) and Andhra Pradesh (Salagrama & Dasu 2021) flags competition between dried fish destined directly for human consumption and dried fish in the form of fishmeal destined for aquaculture and poultry feeds. There is a serious risk

of increased diversion towards animal feeds that potentially threatens food security for poor dried fish consuming populations (Surathkal et al. 2023). The degree to which fishmeal production is a threat to dried fish production, however, remains debated. Our partner in Andhra Pradesh argues that fishmeal production is instead the result of long-standing problems with the organization of fishing and of fisheries governance. Most importantly, state policy has promoted trawler fishing methods that cannot avoid catching large volumes of juvenile and undersized fish. Much of this catch is unsuited to direct human consumption so, by implication, fish meal plants have not driven the overexploitation of marine fisheries at the expense of human nutrition security but just taken advantage of an existing supply problem (Salagrama & Dasu 2021). Nonetheless, there are fundamental problems in the organization of fish production in India that affect the supply of fish for drying and create conflict between small-scale dried fish value chain actors and other groups involved fisheries or animal husbandry.

Other illustrations of how values are influenced and fought over across time and spatial scale are evident in this volume along with useful alternative ways of thinking about the question (Pradhan et al.: Ch. 24). The key point is that dried fish are as subject to the diverse effects of change, human design, complex social economic logics, and ecological variability as any other product type in human economic affairs.

Transforming dried fish

I started the main part of this paper with a personal reflection on dried fish. I return to that point of departure in conclusion to acknowledge a further layer of the argument that I am making about how dried fish can be understood in terms of the transformation of values. The members of Dried Fish Matters are also participants in making value out of dried fish. A core part of the rationale for the project was itself a value proposition – dried fish are undervalued and poorly understood and Dried Fish Matters sought to re-evaluate dried fish. It's too early to say what cumulative impact the Dried Fish Matters team will have on dried fish and its values, but it's already evident, as this

1. TRANSFORMING VALUES: REFLECTIONS ON HOW DRIED FISH TAKES...

volume shows, that the body of work that we are beginning to assemble is unlike anything that has come before in its ambition, scope, and interest in dried fish as a vehicle for value (see also <https://driedfishmatters.org/pub/publications.html>). As a project, we have also yet to fully embark upon the task of translating our findings into suggestions and actions for improvement in dried fish value chains. As we engage in that work, we are committed to a transformative approach to dried fish.

In this paper, I have added an idiosyncratic perspective on the core Dried Fish Matters interest in dried fish and values by reflecting on dried fish as embodying transformation, particularly from the perspective of economic anthropology. Functionally, as I noted in the second section of this paper, dried fish facilitate value addition but, as importantly, they diversify the possible values of raw fish. Extended shelf life does not just allow for greater profitability of fish. Dried fish is a projection of our own individual interests, perceptions, and values, but the dried fish consumption choices we make and the tastes we cultivate are relational – we perceive and eat dried fish in particular times and particular places, with particular people. Dried fish shows that economic relations concern not just the material matters of production volume, profit, and wages, but also activities rich with meanings that can only be understood in social and cultural terms. Those meanings and those relationships, in fact, are core to economic behaviour.

I don't intend my reflections here to be comprehensive or complete, but rather a continued invitation to the participants in Dried Fish Matters, and to others whom the project may inspire, to carry on the unpacking of a fascinating and tasty product that deserves much more attention.

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References

Belton, Ben, Derek S. Johnson, Eric Thrift, Jonah Olsen, Mostafa Hossain, and Shakuntala Thilsted. 2022. 'Dried Fish at the Intersection of Food Science, Economy, and Culture: A Global Survey'. *Fish and Fisheries* 23 (4): 941-962. <https://doi.org/10.1111/faf.12664>.

Biswal, Rajib, Derek S. Johnson, and Fikret Berkes. 2017. 'Social Wellbeing and Commons Management Failure in a Small-Scale Bag Net Fishery in Gujarat, India'. *International Journal of the Commons* 11 (2): 684-707.

Biswal, Rajib, and Derek S. Johnson. 2023. 'A Social Wellbeing Approach to the Gendered Impacts of Fisheries Transition in Gujarat, India'. *Maritime Studies* 22 (2): 13. <https://doi.org/10.1007/s40152-023-00299-0>.

Graeber, David. 2001. *Towards an Anthropological Theory of Value: The False Coin of Our Own Dreams*. New York: Palgrave.

Johnson, Derek S., Tim Acott, Natasha Stacey, and Julie Urquhart. 2017. 'Reflections on Social Wellbeing and the Values of Small-Scale Fisheries'. In *Social Wellbeing and the Values of Small-Scale Fisheries*, edited by Tim Acott, Derek Johnson, Natasha Stacey, and Julie Urquhart. Dordrecht: Springer.

Lokuge, Gayathri, Kyoko Kusakabe, Prak Sereyvath, Derek S. Johnson, and Ben Belton. 2023. 'Cambodia Scoping Phase Report'. Dried Fish Matters. University of Manitoba and Cambodian Institute for Research and Development. <https://driedfishmatters.org/pub/dfm-working-papers.html>

Ruddle, Kenneth, and Naomichi Ishige. 2010. 'On the Origins, Diffusion and Cultural Context of Fermented Fish Products in Southeast Asia'. In

1. TRANSFORMING VALUES: REFLECTIONS ON HOW DRIED FISH TAKES...

Globalization, Food and Social Identities in the Asia Pacific Region, edited by James Farrer. Tokyo: Sophia University Institute of Comparative Culture.

Malinowski, Bronislaw. 1922. *Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea*. London and New York: Routledge and Keegan Paul.

Masiero, M., D. Boscolo, S.K. Barua, I. Animon, and J.R. Matta. 2019. *Valuing Forest Ecosystem Services: A Training Manual for Planners and Project Developers*. Vol. 11. Forestry Working Paper. Rome: Food and Agriculture Organization of the United Nations. <https://www.un-ilibrary.org/content/books/9789210039598>.

Nair, Tara, and Himani Baxi. 2022. 'Institutional Context of Marine Fisheries in Gujarat: A Review'. Working Paper 11. Dried Fish Matters. The University of Manitoba / Gujarat Institute of Development Research. <https://driedfishmatters.org/pub/dfm-working-papers.html>

Pradhan, Sisir Kanta, Prateep Kumar Nayak, and Derek Armitage. 2022. 'A Social-Ecological Systems Perspective on Dried Fish Value Chains'. *Current Research in Environmental Sustainability* 4 (January): 100128. <https://doi.org/10.1016/j.crsust.2022.100128>.

Surathkal, Prasanna, Amalendu Jyotishi, Ramchandra Bhatta, Joeri Scholtens, Derek Johnson, Gargi Mondal, and Priya Gupta. 2023. 'Implications of Utilization Shifts of Marine Fish in India: A Macro-level Empirical Analysis'. *Reviews in Fish Biology and Fisheries* 23 (4): 941-962. <https://doi.org/10.1007/s11160-022-09752-5>.

Salagrama, Venkatesh, and Arjili Dasu. 2021. 'Living on the Edge: Perspectives of the Small-Scale Women Fish Processors of Northern Coastal Andhra Pradesh, India'. Working Paper 07. Dried Fish Matters. India: The University of Manitoba / District Fishermen Youth Welfare Association.

DRIED FISH MATTERS

<https://driedfishmatters.org/pub/dfm-working-papers.html>.

2. Why, How, and to Whom Dried Fish Matters: A Conversation Among Researchers

This conversation is taken from a panel discussion at the Small-Scale Fisheries Open House held during World Ocean Week in June 2021, facilitated by Ben Belton. The discussion follows a presentation of the video *What Is the 'Value' in Dried Fish Value Chains?*, featuring comments on value and governance in the dried fish sector from Tara Nair, Sisir Pradhan, Gayathri Lokuge, Mostafa Hossain, Anupama Adikary, and Shalika Wickrama. The text has been edited for clarity.

Speakers

Anupama Adikary, University of Ruhuna, Sri Lanka

Mostafa Hossain, Bangladesh Agricultural University, Bangladesh

Gayathri Lokuge, Centre for Poverty Analysis, Sri Lanka

Tara Nair, Gujarat Institute of Development Research, India

Sisir Pradhan, University of Waterloo, Canada, and

Shalika Wickrama, University of Ruhuna, Sri Lanka

Facilitator

Ben Belton, Michigan State University, USA / IFPRI, Bangladesh

Transcript

Ben: I'd like to start off with a question for Tara, or actually two questions that are linked. First of all, what are some of the different types of value that are associated with dried fish in your study area in Gujarat? And then, do you find that different groups of people, with different backgrounds, value those dried fish in different ways?

Tara: Good afternoon, everyone. Thanks so much for this opportunity. Gujarat is a very distinct context to study fisheries per se, and definitely in terms of dried fish. It's a supplier to many parts of India and outside India, but it's a very limited consumer of any kinds of fish products. According to official statistics, 75 percent of Gujarat's population has never eaten fish. So that's the context within which the industry is located. But it is a very industrialized state. So, from that point of view, we were not able to see a lot of very deep, cultural associations within the social communities, but an important, alternative value is what I would call *inclusive local development*.

Considering the importance of dried fish processing, given its many parts and its focus on small fishers and small processors, inclusive local development I think is a very important value that we could really observe in the case of Gujarat. It's a very low-technology, low-fixed-cost kind of enterprise, so entry barriers are very low. That really adds to the inclusion possibility of women's participation in the dried sector, of course. I will never say that dried fish processing would bring in a lot of gender equity in the local areas, which is a much deeper sort of a problem. But it has definitely been able to incorporate a large number of women workers into the value chain, because fish drying is a very labour-intensive activity and women are found to be extremely convenient to provide that kind of drudgerous work. But they do participate in a lot of activities.

I think the fourth value would be the deep cultural interlinkages with other regions. For instance, interestingly, the person who really led us into the dry fish industry is a Keralite, somebody who belongs to Kerala but has a very

2. WHY, HOW, AND TO WHOM DRIED FISH MATTERS: A CONVERSATION...

deep financial business interest in the dry fish sector in Gujarat. So there is a very interesting cultural exchange possibility – quite a deep, long-standing historical one – that we were able to discover through this study. I consider that as another important value, apart from all the other values of well-being and such that we generally talk about.

As I mentioned, because Gujarat is not much of a fish-consuming or fish-loving state, we have not even been able to talk to very many people about what they associate with dry fish from a consumption point of view. People in the coastal communities never say “*we are very fond of it*”, although they say that they do eat fish, including dried fish when they cannot get fresh fish. Otherwise, the entire stock is exported to different parts, from Bombay to Bangladesh to the Northeast. And it goes, currently, in the form of fish feed to Vietnam. But that is another story.

Ben: Thank you, Tara. That’s a really nice overview, and quite a unique situation in Gujarat, actually, compared to some of the other sites in the project. I’d like to ask a similar question now to Sisir. We saw in West Bengal there’s quite a different scenario, in terms of the cultural significance of dried fish for instance. Sisir, could you tell us about some of the different types of value that are associated with dried fish in your study area, and then how maybe different groups of people in that area may value dried fish in different ways?

Sisir: I’ll mostly talk about the Eastern part of the Eastern Bay of Bengal. We look at dried fish as strongly culturally, socially, and economically embedded in the whole system of society. As you have seen in the video, it’s a part of the cuisine, a delicacy, and people have many historical consumption relationships with dried fish. At the same time, when I worked in a village here, I saw that people looked at dried fish systems quite differently: they look at it as a form of coping.

The fishing patterns and timing for the small-scale fishers who do not go out deep sea fishing draw on ecological knowledge, which we call *jutia* and *padilla* in our local languages in West Bengal and Orissa. They follow the

lunar cycle – for five days before and after the full moon, and similarly in other parts of the month. They catch a lot of fish, and during that time they see that this gives an opportunity for them to really go for heavy processing, and then they can really survive on that. They look at it as a coping system. Very interestingly, we had a cyclone on the West coast and the next week we had a cyclone on the East coast, then after the cyclone when I checked in the villages where I am working, and I saw people have nothing – they have rice and dried fish. So “*look*”, people say, “*we are only surviving because our agriculture is gone, nothing is available, one cannot go out and buy in a pandemic, and nothing is done!*” So they’re getting some rice from rations and they’re eating with this dried fish. It’s a ready-to-eat kind of food that can be stored for emergency use.

Ben: That was really interesting to hear about the importance of dried fish as a survival food. I’d like to ask now a similar question to Gayathri, actually. Gayathri, you’re currently in Sri Lanka but you were working doing research under DFM in Cambodia as well. So a similar question to you: how do you see the values of dried fish for different groups of people, and do you notice any differences between the South Asian context and the Southeast Asian context?

Gayathri: Thanks, Ben. I’ll start with the last part of your question. Most of my work had been in South Asia, in Sri Lanka primarily, so when I first moved to Cambodia to carry out this research for the Dried Fish Matters project, the first kind of ‘shifting of lenses’ that I had to do was to start recognizing freshwater fish as popular for people. I come from an island nation, and I grew up very close to the sea in Sri Lanka, so we are very socialized into consuming fresh fish that comes from the sea, as well as a dried fish that’s linked to the sea. But when I went to Cambodia, I saw that the whole system – or most of the system – that’s in place in terms of aquatic products for Cambodia, the symbolic value, the economic value, is actually attached to freshwater fish. This is sourced from the Tonle Sap Lake, as well as the Mekong and its tributaries. And there is also the fish that comes from the rice paddies. I think

2. WHY, HOW, AND TO WHOM DRIED FISH MATTERS: A CONVERSATION...

that is one of the big changes that I noticed when I went, then of course living there I also had to adjust my consumption patterns. So that's one part of it. If I talk about the different kinds of values that Cambodians attach to dried fish – or what I actually call 'processed fish' in Cambodia, because there are certain products that are actually not dried in Cambodia, such as fermented fish for example, which is processed and can be kept without refrigeration for a year, two years, three years – I think the diverse product range itself shows how important it is for the Cambodian cuisine.

If I can talk a little bit in detail about the fish paste that is called *prahoc* in Khmer, I think it's very similar to the example that Sisir explained of how important this processed product is to the diet of these people, especially during the lean periods of fishing. In the dry seasons, when the fresh fish production is actually very low, people rely a lot on this. And very similar to this example, a lot of fish paste making actually happens at the peak of the fish catch. There are these big nets, called Dai fishing, bag nets that operate on one part of the Mekong, Tonle Sap, and there is an abundance of fish catch. This is then processed into different varieties, but a lot of it, because this is small fish, is processed into fish paste. And this, with rice, becomes the main food, especially for the rural people in agricultural communities. There are also changing trends in terms of preferences for processed fish. I won't go into a lot of detail, but what we are starting to notice is that with some of the younger generations, their knowledge on producing or making processed fish-based dishes is actually decreasing. There seems to be also a trend, at least in the urban areas in Cambodia, that their food preferences are also changing.

Ben: Thank you, Gayathri, that's fascinating. I'd like to ask a follow-up question about Cambodia. The presentation that you gave really highlighted the diversity of different groups that are involved, in terms of gender, age, ethnicity, nationality, and religion. I wondered if you could comment a bit about how maybe some different groups of people experience or ascribe or gain value from dried fish in

different ways.

Gayathri: Sure. I could talk about scale, for example. At one level it was really difficult to differentiate between the people who catch fish, people who process fish, and people who actually market fish, because in certain cases they were all the same group of people. The same family would be doing all of these. This could be for their own consumption, but they were also marketing these products. So on the one hand, these are the people that actually live on the water bodies, especially in these floating villages on the Tonle Sap, but then when you go a little bit away from these main water bodies then I think the consumption patterns change, because fresh fish was then becoming less available and therefore dried or processed fish was becoming more important in the diet. I think about 75 percent of the protein intake of Cambodians is actually from these aquatic products, fresh and processed. We could also observe, in terms of groups, when you go to the more coastal areas obviously there is a lot more production happening that uses marine products, but there was also a preference for prahoc for example, which is coming from the Tonle Sap. So you couldn't even differentiate and say that people who live on the coast actually like seafish and sea-based products – they still preferred some of the freshwater products as well. These are some of the differences. If I can briefly talk about the gender dimensions, most of the processing, at least at the household and small-scale production level, is actually managed and run by women. The slightly larger-scale processing units were then increasingly being managed by men, but a lot of the workers were still women. As Tara described, there were gender disparities in terms of wages and all that, but still we could see a very high presence of women of all ages, from very young girls to grandmothers, involved in this process.

Ben: I'd like to stick with that theme of freshwater versus marine, coastal versus inland, and move to Bangladesh. I'll ask Mostafa, can you tell us about the different types of value that people in Bangladesh associate with these freshwater and marine fish, and

how they're valued differently in different parts of the country perhaps?

Mostafa: In Bangladesh the dried fish sector is really huge. I don't know how many million people are involved with the wider value chain, from catching fish, bringing it to the drying yard, and then processing, but it is huge. What we found in the main sector, in some of the landing centres, was that although we have some major species like Bombay duck, ribbonfish, and some anchovies, there are also some other ethnic products, such as dried oysters, that only ethnic tribal communities consume. Also we have one fermented product in the marine sector called *nakti*, which is only eaten by the ethnic tribal people. Regarding the value of dried fish, many people and their food nutrition and livelihoods depend on the marine dried fish and seafood sector. There are seasons in the year when people only have access to dried fish for their protein, and this is really cheap, making it affordable and accessible to them. When it comes to freshwater products, there are a few species that are really very important, like the barbs, the *puti* is very important all over the North and Northeastern part of the country, and hundreds and thousands of tonnes of those fish are dried. Also, we have a fermented product, *shidol*, mainly made from *puti*. Initially it used to be made only from *puti*, but in the last 15-20 years, as the *puti*'s diversity is under threat and both the demand and price are increasing, people have started to ferment marine anchovies and this is a huge value chain. What we found is that not only the people in Bangladesh are eating those things, but there are also, I think, several hundred thousand people in the overseas Bangladeshi diaspora who are very fond of both the dried and fermented products, so those are often going overseas, and they are market-oriented.

Actually, where I was born and brought up, I didn't eat any dried fish in my boyhood. I didn't know anything about the dried fishing in that part of Bangladesh. But as I came to Mymensingh to study, and later became involved with dried fish, I found that the sector is really, really huge, and involves very many people. We found with the people in Cox's Bazar, even though they have fresh fish, they would still like to eat the dried fish. Sometimes when

people travel, they bring some gifts, and that must be dried fish or fermented fish. So these things are really huge. Having said that, this has been going on for, I don't know, hundreds of years, but still I found that the government policymakers are sort of oblivious to the sector. They just don't know or [can't] visualize how big the sector is, what the pros and cons of the sector are, or what the problems and prospects are. I feel that through this Dried Fish Matters project, given that it's a long project and hopefully with the way we are working – we the biologists are getting involved with anthropologists and sociologists – hopefully there will be much more and much clearer visualization of dried fish in Bangladesh.

Ben: Thank you very much, it's a really nice overview of the situation in Bangladesh. Following on the last part of your question there, I'd like to ask Anupama, how does dried fish figure in state policy and development activities in the area that you've been working in Sri Lanka, and what actions do you think could help to support dried fish value chains to create more positive values?

Anupama: In Sri Lanka there are not any national policies related to dried fish. But a number of policy-oriented studies can be available under different categories, such as production market channels, market strategies, or nutrient and quality standard values. So we should extract the information from these studies and develop national policy for the dried fish industry.

Ben: Based on the kind of research that you've been conducting so far, do you have some ideas about what kind of policies might be effective to bring out the best of the values of the sector?

Anupama: Actually, when we compare fishers' organizations to dried fish organizations, the dried fish organizations are not as strong. We can do something to increase and expand dried fish processing and trading organizations and increase their voices within fisheries sector through policy improvements.

Ben: Shalika, is there anything that you've learned in your research so far with DFM that's challenged your expectations about dried fish?

Shalika: Yes, there are a lot of challenges for dried fish processors and traders in Sri Lanka, related to technology, lab utilization, and market opportunities. There are no proper market opportunities. There are no proper lab utilization techniques. And there is no proper dried fish association in Sri Lanka. Also, there is no good connection between traders and processors, and there is no supply of better-quality raw material. Most of the dried fish production techniques or value addition techniques are comparatively low standard. I have to mention especially that there is no strong technology utilization or dried fish processor association in Sri Lanka. These things mainly affect the economic strength of the dried fish processors and other value chain actors in the dried fish industry in Sri Lanka. Those are the main challenges.

Ben: Thank you, Shalika. You are describing similar challenges to the ones that Anupama highlighted there, about the sort of lack of organization and the lack of voice for people in the dry fish sector. Maybe now we can have a wider question for the group that anyone can answer if they'd like: "Have you identified any changes that are taking place in the way that dried fish is valued, in any of your study areas?" "How are the values associated with dried fish changing over time?"

Sisir: I think dried fish is a very interesting sector now. If we look at the whole fisheries sector and its influence in dry fish, and the value associated to it by different stakeholders, although the small-scale fishers associate values as they used to – because it is emanating from their historical and cultural perspective, identity issues – elsewhere in the value chain, other actors are looking at it very differently. Say in the East coast of West Bengal and Orissa, I see there is a lot of policy impetus on culture fisheries. And there are 'place-

based' fisheries – like “this place is like very good for shrimp cultivation”. So the specific emphasis on species alters the whole management and kind of catch dynamics in the systems, and that is creating a lot of further changes in the sea space itself in the relationship with the fishing systems. The issue is that now people are getting the same input for poultry feed for fish meal for many others. So the market structure is changing, and in that sense the whole dynamics within the fishing community are changing. Earlier, people used to dry fish for food. All the fishers come to dry [fish] for food. There is a psychological and social kind of attachment to this kind of activity. Now there are segments within that value chain, and now I see in my in the village I am working in, a new kind of a system is emerging where big actors having big nets, big boats, are consolidating the production. Some are consolidating for fish feed, some are still going for particular food products. But the problem is that the market system is not that organized so the people who are into sun drying and similar forms of production at times are losing out. So there's a major tension happening at the community level and there is change happening in the fish chain.

In terms of value, with the changes happening now in these kinds of transportation, the kinds of competition within the space, and these kinds of auctioning systems and trade systems, fish are also getting exchanged more than before. Orissa is giving a lot of fish to Bangladesh in terms of shrimp, while we are getting lot more hilsa and those kinds of fish from Bangladesh. So there are a lot more changes happening in that space. There are also policy impetuses there. You are aware that WorldFish has worked in Orissa, we are now bringing nutrition and dried fish together into a midday meal and kind of social protection programs. And there are new actors like SIGs are coming up. So we have the traditional fisher communities and their associations, and there are also government-promoted SIGs and those kind of networks coming in. Investment is coming in. There are changes happening in that, some of which are good, but there are also kinds of muddy waters at that level. Now there is a space to look at all these issues and see how the traditional fishers and these kinds of institutional arrangements can work together for a better kind of economic and social value at the community level.

Ben: That's a really interesting pattern there, with the policy drive towards aquaculture sort of contributing to this competition for fish as food, and the changing dynamics associated with that.

Tara: In order to think about a policy solution, to understand the changing structure of the dried fish sector, we need to really look at the fisheries sector in general. A piecemeal sort of an approach would not do any good to dried fish as a sub-sector. We need to really reimagine how we look at fisheries development per se, as a currency in the world market, so that you can make more and more foreign exchange using newer technologies – whether it is aquaculture or mariculture or Blue Revolution or whatever it is. I think we are just looking at fisheries as just a currency which can enhance the national economy. I think that has to completely change, even to make the dried fish values different.

Ben: So really advocating for a sort of food systems approach to understanding fish as a whole, and where dried fish fits into that.

Mostafa: I just would like to point out one thing. In a recent study, we found microplastics in our dried fish – and it's not a very small amount, it's a large amount of microplastics present in all the dried fish we analyzed. This could be a new area of study, and I would like to ask the partner countries if they have any idea of the microplastic contamination in their products, and also other chemical contaminants if possible. Microplastics are a significant global problem. In both marine and freshwater fish there are microplastics. And these microplastics, when it comes to the dried product, actually become concentrated three to four times.

Ben: That's an emerging trend, and quite a worrying one, that we're starting to see. I'll just take a minute to summarize if I can. I think this has been a really fascinating discussion. It just really underlines

what an incredibly interesting subject this is. There are just so many angles to explore. I think something that comes through really clearly from all of the presentations is diversity, in terms of the products produced, the geographies involved, the different groups of people, the different sets of values that are derived from dried fish. And then also, I think something that came through really nicely in one of the first presentations from West Bengal is the need for really transdisciplinary research, such as DFM is helping to bring together, to understand this diversity and make sense of it across scales and across multiple sites. I think we have heard evidence that we're moving slowly towards this goal, and hopefully by the end of the project we will have a much more complete understanding of this whole fascinating world.

II

Food, Life, and Stories

Introduction – A Narrative of Many Narratives

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Even in his last moments, it's said, in the split second of a fatal fall - or when he's about to drown - he sees, passing rapidly before him, the story of his whole life.

Graham Swift, *Waterland*

“Oh! Your father is a fisherman? So, you also will be a fisherman or fish trader. Why do you come to school for studying?” Roy, a university student with a non-Maimul background, shares his experiences from school with the authors of Chapter 14: The Story of Maimul. Students from Maimul families usually grow up with such demeaning treatment from their teachers in the Sylhet region of Bangladesh. Gestures of this sort, however, can be related to stories in other places where caste-based identities of fishers lead to a variety of outcomes. *“No matter, how much money I earn, people call us Maimul, denigrate us”*. Such a strongly felt assertion leads to questions: What might such disparagement reveal about the social lives and economic conditions of the Maimul community? Why do an individual's rights and vulnerabilities so strongly reflect their affiliation to a specific social group? How do long-

standing socio-ecological relationships and cultural values produce a sense of belonging to community? This section of the e-book addresses some of these questions, rooted in the chequered stories of fishers, fish processors and small-scale traders who have established multiple acquaintances to dried fish through their situated knowledge, labour, and socio-cultural practices.

As the title suggests, the section is concerned with ‘life stories’ and recipes, where the former engages the teeming lifeworlds¹ of fishers and fish processors within diverse social, economic and institutional contexts, and the latter illustrates ‘anecdotes of dry fish’ embodying esthetic preferences, histories, memories and inherited values. In this spirit, every page of this section seeks to explore stories beneath a story of dried fish economy in countries of South and Southeast Asia – Bangladesh, India, Thailand, Sri Lanka, and Myanmar. “The twelve core chapters in this section adopt stories and recipes as qualitative frames of expression to illuminate relational dimensions and values attached to dried fish.

Life stories seek to carve meanings out of experiences, perceptions, and practices of an individual or a community in a specific area. In listening to, plotting, and reading life stories, we make sense of how human lives revolve within the nature of multiple relationships and belief systems that are characterized simultaneously by risk and reward. Often conceived as oral narrative, a life story is more than simply the blending of views and subjective experiences from a shared reality; it is also the complex way the threads are interwoven to frame an identity and define a way of life. In an ethnographic fashion, a life story draws in descriptions of an individual’s life trajectories within an integrated social, ecological and institutional scenario in order to uncover the patterns of relations and various processes that frame the pathways of life. Beyond mere thematic interpretations or objective

¹ The ‘lifeworld’ concept provides a philosophical basis for understanding individual perspectives within the seamlessness of everyday life and realities. According to Hörberg et al. (2019), the lifeworld is an individual’s approach to world and life, which also shapes approaches to their daily living and depends on the historical, cultural, social as well as ecological contexts they are involved in. It can be understood as ‘a world of experiences’ as it continually evolves through experiences.

assessments of disparate socioeconomic contexts, stories urge us to look deeper into the manner in which affiliations, inequities, involvements, modes of practices, constraints, and values shape and in turn, get shaped by the structure and processes of social organization, such as caste, kinship, class, gender and religion. In doing so, stories put forward what it means to live, function, and be vulnerable in relation to others in a collective and thereby, convey how these proximities generate a ‘deeply felt sense of mutuality’ (Govindranjan 2018) or antagonism among ‘located lives’.

Viewing dried fish as an outcome of many activities and fluid interactions among actors, the chapters in this section capture the varying ways in which the significance of dried fish is perceived and given value. Rather than simply identifying the economic importance of dried fish with regards to value chains, the chapters lay out dried fish as the livelihood of a large number of people who struggle with emotional challenges and anxieties that emerge within intertwined social, political and ecological arrangements. In a commitment to situate the storylines in relation to specific socio-ecological worlds where the characters of their stories dwell, the authors provide the readers with strong empirical base and a set of analytical designs. This allows the authors to take an immersive journey and enables them to fit their own stories to those of the storytellers in the field.

“*An outsider is always an outsider*” (Ch. 12: A Woman in a Strange Place) – this is not only an epithet in Cho Cho’s life but is a reflective of how a woman is symbolically and systematically positioned as the ‘other half’, subjected to ultimate relegation and subordination in the uneven social settings of global South. In this sense, the author Khaing frames her essay as ‘a woman’s reflection on a woman’. Estranged by her surroundings, Cho Cho is a fish processor and retailer who has traditionally contributed not only to the dried fish business of her sister-in-law of but also to upkeep her own household. Her tale unpacks how the family relationship has evolved into a production *relationship*, wrought with trust and ‘obligation to reciprocate’.

Chapter 11 (Dawn to Dusk) describes Yellamma’s arduous tasks as a dried fish vendor in Andhra Pradesh, India. Yellamma’s story indicates how she has to cultivate a deep-seated disposition of ‘extreme tolerance’ in how she

faces new challenges every day. Yellamma fends for her own dietary and sanitary needs during long work hours while her mother-in-law takes on the responsibility of looking after the children at home until they grow up. The authors also noted how alcohol abuse, lack of education, marital issues, and fragmented families also contribute to shaping the social realities of Yellamma's community. However, struggles of fish vendors like Yellamma, whose 'voices' get 'strained due to loud and continuous shouting' in the streets, underscore that 'fish is women's business too' (Máñez & Pauwelussen 2016). Yellamma's travails can also be read in Malini's story.

"Previously [at the beginning of the business] I had to mortgage all my jewellery to buy fresh fish", says Malini Peramuna who has been involved in Maldivian fish processing since childhood (Ch. 3: Malini Peramuna). Malini now supports her family while also working as the organiser of the United Fisheries Society, a fish processing association. Alongside supporting her children with money, she is an employer of two women and a man who work as fish processors. Malini's tale further highlights current changes and constraints in processing practices, as well as economic challenges that dried fish producers face during the rainy season.

Privately owned, community-operated dried fish organizations in the Indian Sundarbans (Ch. 5: Local stories of the global Anthropocene & Ch. 6: Residing with Risks) observe how the heavy burden of major socio-ecological threats (fish stock reduction, shrinkage of islands, low daily wage/income, women trafficking, cyclones) are perceived, experienced, and adapted to by the women '*hajira*' labourers. Precisely, vulnerabilities and adaptive responses to the consequences of climate change and environmental degradation are inherently gendered as seen in differential roles, limited access to resources and illicit decision-making spaces (Ashraf & Azad 2015). While the narrative of the Anthropocene sweeps the global stage, local stories of Sandhya, Jharna, Sumi, Miloni, Vandana, Puja, who make a living from imperilled ecologies and labour for a low wage, remain untold. Although they recount similar events, they keep knitting different stories obtaining much of the force from their everyday entanglements, memories of disasters, and their faith in varied ways that reflect a gendered arrangement in dried fish. As conveyed in the Chapter

8: Trawling the Shutki Tidalectics, the dry-fishers of Indian Sundarbans are increasingly inclined to migrate out for a safer and 'better paying livelihoods'.

Nevertheless, Vishnu Valiya's reassuring writings remind us of the 'Dreams Rising in the Sea' (Ch. 9: Tales from the Sea).

"The 'sea' has been at the center of most of my writings...because very little has been written on it. And I have come from this environment; I am formed in this. I live between a fleet of boats and a pile of fish, so I put the same things into words..." (Vishnu Valiya, dried fish processor from Jafrabad in Gujarat)

What makes Vishnubhai contemplate so? Indeed, the dried fish processing in which he is involved moves way beyond a mere means of livelihood for Vishnubhai. His daily interactions with the sea, boats, and Bombay Duck have evolved into a knot of relationships, providing comfort in his own environment, endeavours, and writings. Such ineffable affinity is an outcome of intense care and consciousness that is echoed through the process of preparing dried *Bumla*, coping with the rage of the 'angry sea' and cherishing the tales of Kharwas, a leading community of fishers and sailors intimate with the sea on the western Indian coast. In Vishnubhai's story, we see how the concerted interplay of 'agency, emotion, and intention' are manifested in the everyday social and personal lives of fishers.

Dried fish stories are not, of course, limited to this section of the book, even if they are more explicit here. In the value chains section, for example, Suman Halder, owner, and operator of a small, dried fish retail shop close to the Maligaon fish market in Assam tells the story of how "*Dried indigenous small fishes have a bright future in the context of Assam*" (Chapter 18: Dried Small Indigenous Fish are the Pride of Assam). While Suman was born in Assam, his ancestors moved from Bengal many years ago and, simultaneously, the dried fish they knew as *Shutki* in Bengal became *Hutki*, the local name for dried fish in Assam. An array of traditional tools and techniques are used to prepare *Shidol Hutki*, a most-cherished fermented small fish product in the north-eastern region of India. Suman describes how Assam's expansive

open water ecosystems (such as *beels*², meandering rivers) have favoured the growth of small freshwater fish like *Punthi* and *Moa* that are used for producing Shidol Hutki. However, he strongly believes that the waterbodies and wetlands need greater focus on protection and restoration as the fish habitat is threatened by various human interventions.

Is it that the humans can only narrate a story? Paying ‘sensory attention’ to the glimpses of life story above, enables us to convey the story of a ‘nonhuman’ entity i.e. fish. Fish voyage deep in waters until, eventually, they transcend to the social lives of humans and permanently sustain the traditions, stories, beliefs, and knowledge that are passed down from generation to generation. To put it differently, drawing the ‘other-than-human’ life into the sphere of human experience and apprehension, results in some ‘other kind of stories’.



Figure 1. Fish symbolism in ancient South Asia. Source: Belcher 2018

Since antiquity (Figure 1), traditional fish preservation through drying, salting and smoking has been conducted and transmitted through the ancestral

² The term ‘beel’ refers to a wetland resembling a lake within the floodplains of Bangladesh and West Bengal in India.

cultures in many societies of South and Southeast Asia (Agrawal 2006). Drying and curing of fish not only allowed storage of seasonal surpluses for use in the times of dearth, but its influence on cultural traditions and relation-making was irreplaceable, a value that has been carried through to the present (Agrawal 2006). Diverse usage of dried fish in traditional culinary habits is not only indicative of varying olfactory desires, but also defines the emotional (nostalgia, memories) and cultural aspects of dried fish, embedded in customs, culinary knowledge, lore, rituals, and the like. It is at the interface of long-entrenched identities, food habits, and cuisines, a putrid fish becomes undesirable whereas dried fish with its strong taste and ‘memorable’ aroma, is a delicacy. “*The aroma of the dried fish was always pleasant to my memory*”, recounts the author of Chapter 10 (Grandmother’s Recipe). The enticing flavour of dried fish protects the tender recollections of grandmother who “*loved to have it on her plate everyday*”. However, dried fish is not always a ‘delicacy’ in rural settings in which it is primarily perceived as a low-cost food that can be used for a long period of time without preservation. In many instances, dried fish sets people apart by their sense perceptions including smell and taste, despite its paradoxical role in integrating people based on culture. The latter, however, is more prominent in urban contexts characterized by mobility, material flows, and dynamic exchanges. Expressive of the cultural oneness of undivided Bengal (India) and Bangladesh, dried fish is either savoured by the people of the two countries in a nostalgic way or has been rejected because of the repugnant odour. Nonetheless, a mash of dried fish with easy-to-chew bones, cooked tenderly with garlic, chillies and onion eaten with rice, is a habit steeped in the reminiscence of bygone times. The author of Chapter 7 (Dried Queenfish with Coconut Milk) narrates the story related to “*the fish that made her want to cook*”. The instructions of her grandmother sear deep-down into her memory and come to the surface whenever she prepares dried queenfish curry with coconut milk. Grandma’s dried fish fry is, thus, carried across generations, like the strong smell emanating from the kitchen that travels far with the wind.

Served at ‘Duen’s Lone Table’ Khun Duen’s ‘Kapi’, which she proudly proclaims ‘the best’, has accompanied her since the time she used to have only

one table in her restaurant (Ch. 4: All about Kapi). Thailand's very own Kapi is made of krill-like tiny shrimp found in muddy habitats. *"According to Khun Duen, fishers who earn their living by fishing also care about the ecosystem and the population of fish in the sea". How inextricably the socioeconomic lives of many small-scale Kapi producers like Khun are connected to local ecologies is manifested in their effort "to keep the sea as healthy as possible"*. While Kapi finds a wider place in local markets, groceries, and supermarkets across Thailand, small-scale producers encounter in contested grounds a new set of regulations of the Fisheries Department.

Once a fish processor and seller of Thane (India), Kamal Kashinath Tandel has in her treasure a few recipes, of which 'Davla and shrimps' is her dearest (Ch. 13: Davla and Dried Shrimps). Not only is the recipe close to her heart, but so is the mangrove forest where the Davla creepers and mud crabs thrive. As culling of mangroves and edible vegetables is intensified with the encroachments of land mafias, she is worried. After all, it is not just the mangroves that are at stake, but also the connections that were established through the recipes of long ago.

This section carves out many narratives from around the socio-ecological landscapes of the South to weave an overarching narrative that shines light on the diverse lifeworlds, strengthened by relationships, practices, and values. Multiple accounts that the section presents, bend the rule of a linear storytelling structure as they involve many narrators telling stories within a compelling broader story and, in doing so, they keep adding layers of complexity, enrich thematic expressions, diversify perspectives on events and deepen the understanding about the lives around dried fish social economy. In essence, the narratives are composed of many intersecting storylines that are so often connected by similar themes, circumstances or actor identities at different times and spaces. For example, whether it is a fierce cyclone Aila in India's eastern coastal belt or cyclone Taukte striking the Gujarat coast in western India, the dialogue between two stories show how catastrophe makes the women fish processors of Bengal's dried fish camps and family-level fish processors of Jafrabad (Gujarat) scared and insecure of an imminent ominous reality. This section of the e-book can be beneficial to interdisciplinary

researchers, practitioners, and readers beyond any academic disciplines, who are interested in traversing the risky yet value-laden socio-ecological terrain of dried fish practices in countries of South and Southeast Asia. Furthermore, the open-ended framings of chapters, freed from conventional analytical bounds, are capable of engaging both academicians and non-academicians who look for insights and different ways of visualizing the dried fish sector to address solutions.

References

- Agarwal, and S.C. Agarwal. 2006. *History of Indian Fishery*. Daya Books.
- Ashraf, Mirza Ali, and Md. Abul Kalam Alam. 2015. 'Gender Issues in Disaster: Understanding the Relationships of Vulnerability, Preparedness and Capacity'. *Environment and Ecology Research* 3, no. 5 (2015): 136-142.
- Belcher, William R. 2018. 'Fish symbolism and fish remains in ancient South Asia' In *Walking with the Unicorn: Social organization and material culture in ancient South Asia*, 33-47. Summertown, Oxford: Archaeopress Archaeology.
- Govindrajan, Radhika. 2018. *Animal Intimacies*. University of Chicago Press.
- Hörberg , Ulrica, Kathleen Galvin, Margaretha Ekebergh, and Lise-Lotte Ozolins. 2019. 'Using lifeworld philosophy in education to intertwine caring and learning: An illustration of ways of learning how to care'. *Reflective Practice* 20, no. 1: 56-69. 10.1080/14623943.2018.1539664.
- Máñez, Kathleen Schwerdtner, and Annet Pauwelussen. 2016. 'Fish is Women's Business Too: Looking at Marine Resource Use through a Gender Lens'. *Perspectives On Oceans Past*, Springer Dordrecht, 193-211.

3. Malini Peramuna: Life History of a Maldivian Fish Processor and Producer Association Leader

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Summary

This is a life history of Malini Peramuna, a female Maldivian fish processor in her early 60s. She has been a processor for nearly 40 years and the organizer of the Maldivian fish processing association in her village for the last four years. Her story illustrates the history of the Maldivian fish processing industry in Kottegoda, a leading location of this industry on the south coast over the past decades. It provides information on the varieties of utilized fish, main technological changes, as well as the opportunities, constraints, and vulnerabilities of producers. As the former president of the fisheries society and the current organizer of the Maldivian fish processing association, she also provides insights into the governing structure and functioning of community-based producer groups.

Introduction

Malini was born and brought up in Kottegoda, a fishing community near the town of Matara, on the south coast of Sri Lanka. She has been processing Maldivian fish³ from her childhood. Since 2016, she has also been in the forefront of a producer's association, which she initiated in her village. She narrated her life history during fieldwork conducted by the Dried Fish Matters Sri Lanka team on the morning of 9th of December, 2020. The account described on these pages is her response to the question, "*Can you tell us something about your life as a processor in this community?*". While we gave her the space to tell her story in her own words, based on the sequence she provided, we also asked her to elaborate her narrative by querying on issues of changes in processing, fish consumption preferences, and wellbeing.

A tradition in Maldivian fish processing

I was born in 1961 in this village. I am now 60 years old. I have two daughters and a son. One daughter and son live in this village, Kottegoda. The daughter who lives in Kottegoda is also a Maldivian fish processor. My son is working on a 'multi-day' boat. The other daughter lives in Dickwella. Her husband is also working on a 'multi-day' boat. They all have their own houses. I live here with my husband, who is also from this village.

I have been doing Maldivian fish processing since my childhood. My parents also did the same and we used to help them as children. I continued Maldivian fish processing after my marriage. However, this was on a small-scale. Those days, I also did coir [coconut fiber] rope-making as an alternative livelihood. During the period of 1984 – 1990s we did not do Maldivian fish processing. None of the villagers in Kottegoda were processing during that time. I cannot remember the exact reason for not engaging in Maldivian fish processing. It

³ Maldivian fish processing is a traditional fish preservation technique used in Sri Lanka, that originated in the Maldives. The process involves the fish being cleaned, boiled, split, smoked and dried for two to three days in the sun. Maldivian fish is generally used as a condiment, with Maldivian fish sambal being a popular dish during special occasions.

could have been due to a reduction in prices but I am unsure. I engaged fully in coir rope-making at that time, collecting and selling rope. Later in the 1990s, I can't remember the time period exactly, we started Maldive fish processing again. If I recall...yes, at the time of the Tsunami [of 2004] we were doing Maldive fish processing. Some of our stocks got washed away, including the utensils. Later, we received most of the utensils and other equipment as support from the government to restart the business.



Figure 1. Malini drying boiled and smoked Maldive fish on a rack constructed of wood and metal sheets, alongside her house. Credit: Dilanthi Koralagama, 2020

The business of processing

We buy raw fish from Mirissa [fisheries harbour] first, and then [if not available in Mirissa] Beruwala, Galle, Ambalangoda, Kudawella, or Dondra. There are commission agents with lorries whom we often contact to get fish at a lower price. Usually, they charge about 10 percent commission per kilo of fresh fish. Skipjack, Frigate tuna, and Bigeye scad are the commonly used fish varieties. But I do not like processing Frigate tuna and Bigeye scad as

3. MALINI PERAMUNA: LIFE HISTORY OF A MALDIVE FISH PROCESSOR...

these are smaller fish varieties that require too much work. At the same time, we need more labour and space for processing these. Therefore, I process only Skipjack tuna. The work becomes nauseating with small fish as we have to handle the fish for a longer time. But Skipjack tuna fits well into our hands [*hondata athata ahuwenawa*]. Generally, I purchase 2,000 kg at a time. The prices are normally around Rs. 200/kg⁴ for large sized fish and Rs. 190/kg for small fish. I have space to dry 3,000 kg or a bit more. I have four drying racks. Since I do not utilize all the space I have, my daughter uses these racks as well.



Figure 2. Boiled and smoked Skipjack tuna drying on the rack; the whole fish in the background is better quality and sells for a higher price than the broken pieces in the foreground. Credit: D. Koralagama, 2020

⁴ USD 1= LKR185.71 on the date of the interview

Workers and family contribution

Two women and one man are employed at a daily rate of Rs. 2,000 and Rs. 2,500, respectively. We get workers to split the fish after smoking and to lay it on the racks for drying. If it rains, we have to smoke and dry it again. In such a situation we hire labourers, particularly women. Those without husbands [female-heads of households] or wives whose husbands work in multi-day boats come to us as workers for processing. In my family, my husband especially, helps a lot. He helps to dry fish and to cover the fish using polythene sheets in the evening. My daughter helps in removing the bones, and assists with all other tasks.

Selling the processed Maldive fish

We sell Maldive fish to traders who come to this village. A Muslim trader known to us from Kalmunai on the east coast of Sri Lanka buys most of our stock. We travel by the Kalmunai-Matara [long-distance] bus. The trader picks us up at the bus stand and takes us to his store. He buys all the stock and pays cash. Then he drops us back at the bus station. He is very hospitable. I usually go with my daughter. We make two trips per month carrying 400-600 kg at a time. Traders also come from Hunnadeniya [a nearby village], Matugama, Kurunegala [this is also a Muslim trader], Middeniya, Walasmulla. The first day they come on an exploratory visit just to ask for Maldive fish. Then they take our contact numbers and call us when they come next. Muslim traders from Kalutara and Moratuwa come to purchase the viscera [*badawatha*] at a rate of Rs. 300 per kg to produce chilli paste and maldive fish sambal.

Initiating a producer association

Four years ago, I formed an association under the guidance of the fisheries officer in this region. It has been registered as '*Ekamuthu dheewara samithiya*' [United Fisheries Society]. There were 25 founder members and now it has

3. MALINI PERAMUNA: LIFE HISTORY OF A MALDIVE FISH PROCESSOR...

grown to 108. The majority [of members] are women; we have only 15-18 men. Life memberships can be transferred to others. However, no one can send representatives to the meeting. Instead, a letter of excuse needs to be sent for not attending the meeting. The members have to deposit Rs.1,200 as an initial fee. They are entitled to loan facilities with 5 percent interest. The aim of establishing this association was to distribute government assistance, subsidies and training programmes. I was the president of the association for two consecutive years and am now working as an organizer. We have distributed metal sheets [for racks to dry fish], four boxes in which to put fish, a knife, and boiling pots to each member. There was a four-day training session conducted by the Ministry of Fisheries and NARA [National Aquatic Resources Research and Development Agency]. Unfortunately, it [the training] was not effective and appropriate for our context as it was not practical. Meetings are summoned on the 2nd of each month at 3 PM, in Mr. X's house. His house has enough space for a gathering. The fisheries officer attends the meeting to inform us of their decisions. Collective activities, such as *shramadana* [community self-help campaigns], *Bodhi pooja* [offering at the Bo-tree], cleaning the temple before the *poya* [full moon] day, and cleaning roads in the village are conducted. As an association, we have requested a large oven with drawers, where we can dry the stock as a group during the rainy season, from the fisheries officer. The oven would help to keep our stock without being spoiled. We have also requested a Maldivian fish sales center. Members from the association can be in charge of this. Traders can purchase directly from us. An efficient mechanism is needed as in the paddy [rice] sector with a minimum involvement of middlemen. Food City [supermarket chain], *Sathosa* [cooperative chain], and other retailers can buy directly from us.

We incur losses due to rain and imports. The prices drop even below Rs.850/kg because of imported stocks from the Maldives. I lost Rs. 45,000 once. If we can sell at Rs. 1,200 we can get a good profit and it is fair for the hard work we put in. Rain is the other loss-making factor. Losses are high in the month of the Dondra procession [local temple festival during the month of August] due to continuous rain. In general, about 10 kg has to be

thrown away due to spoilage or because the fish has disintegrated into too small pieces. We throw out spoiled fish and residues into the sea. If we get very low-quality fish then there is a tendency to spoil. The boats which stay longer at the sea bring poor quality fish. Such fish spoils quickly. Once there was a trader who mixed good and bad fish, and was selling at a lower price. We got that information from another person in the harbour. We informed everyone [about him] in this village. As a result, everyone refused to buy fish from that trader. Now he is not coming to this village.

Changes in processing practices

A few years ago only around 10 families were doing this job. Now sons and daughters of those families are continuing – around 42 in total. Those days fish was boiled in big barrels. Then fish was removed from the barrel, one by one, using a spoon with a long handle. Today we put 4-5 fish into one poly bag [plastic bag] and immerse it in the boiling water. Those days we did only 800 kg at a time. But today we boil 2,000-3,000 kg in an aluminum pot. Those days we dried the fish on woven coconut fronds on the roadside. Today we have racks with metal sheets. Drying on the floor is banned due to hygienic reasons. NARA says that it accumulates dust. Previously we used to turn the fish from time to time for proper drying and take it in and out [of the house] in the evening and morning respectively. In contrast, today we do not turn the fish, nor take it in and out, but leave the stock on the rack until it is fully dried under thick polythene sheets.



Figure 3. Currently used aluminum saucepan stored in the yard (on the left). The remaining containers on the right are barrels no longer used for boiling Maldivian fish. Credit: D. Koralagama, 2020

Fish consumption preferences

Usually, we eat dried fish from the boats [*bottu karavala*]. Our son brings the dried fish - mostly Skipjack tuna, *pothubari* [*Callionymus maculatus*], and Yellowfin tuna. We prefer dried fish fried with some oil. But because of cholesterol and health issues we don't consume a lot of oil. We fry it a bit in oil and add some thick coconut milk. Actually, we mostly eat fresh fish and seldom eat dried fish – only with special vegetable dishes, which go together with dried fish, for example moringa and jack fruit. Otherwise, it is fresh fish that we eat.

A good life as a Maldive fish processor

This is an occupation from which we can earn a lot. Although I did coir rope-making before, I could not save much. At the end of the day there was nothing earned and nothing saved. But now I have saved enough money. If there is no imported Maldive fish [coming into the country], we can earn more than we do. We can get a good profit. We can be more satisfied.

Previously [at the beginning of the business] I had to mortgage all my jewellery to buy fresh fish. Now I have cash in hand to buy fresh fish. I give money and support my children as well. We have accomplished our responsibilities. Children provide us with food, rice, milk powder and clothes. I have money. I do not have any difficulties. But that is not true for everyone in this village. There are people who are suffering too. I value living without worries and having enough food, good health, and relationships.



Figure 4. Malini tending the smoked Maldive fish on her drying rack; the sign on her wall announces 'Maldive fish' to traders and consumers. Credit: D. Koralagama, 2020

4. All About ‘Kapi’

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Everyone growing up in Thailand would have tasted ‘kapi’ in one form or another. The most common dish made from kapi, well known to all Thais, is ‘nam prik’ (a kapi-based dipping sauce). Kapi can be found in any Thai kitchen, in an unassuming plastic jar. Little did we know that each jar had its own story, until we visited the places and met the people who make them. This essay captures what we learned about kapi during the DFM field research in Thailand in 2020-2021.

“Our kapi is the best!”

This is the most common phrase we heard during our DFM research about kapi in Thailand. When hearing this early on, we basically smiled and nodded in agreement, and thought to ourselves “*yes, of course!*” After a while, however, it became apparent that not all kapis are equal, and the further we embarked on the research journey, the more our appreciation grew for the care and attention that went into the making of kapi.

Kapi is a dark-colour paste made from krill (tiny shrimp-like crustaceans in

the *Acetes* family). They are found in several coastal provinces in the Gulf of Thailand. In the past when krill were very abundant, they were caught using a traditional, hand-held scoop net, from a non-motorized boat. Nowadays, the *Acetes* scoop net has been mechanized, to operate like a small push net using an outboard motor boat.

Duen Toh Deaw

Our journey began with an informal visit to a restaurant located in Samut Sakhon Province called ‘Duen Toh Deaw’, which is translated into English as ‘Duen’s Lone Table.’ Based on a recommendation of a former student of the Faculty of Fisheries, Kasetsart University, we were able to find this small restaurant not far from the coast. Khun⁵ Duen, a woman of around 40 years old, is the owner and the cook. She is also a fisher and a community organizer, very active in community work. Importantly, she makes the best kapi, by her own admission, and it is well known among the village people and customers. We sat down at one of the tables and asked about the origin of the restaurant’s name. Khun Duen told us that when she started the business, they did indeed have only one table (thus the name). The restaurant was meant to be a gathering place for small-scale fishers to chat and discuss issues concerning them. She and her husband have been fishing for several years and they have observed many changes in the fisheries. They recently added a couple more tables to the restaurant, which still serves as the place for daily conversation and problem solving.

The discussion with Khun Duen revealed that the most famous fish locally found in Samut Sakhon Province is Threadfins (*Carangidae* family). Nowadays, the number of Threadfins has decreased. For this reason, Threadfins are rarely served in normal restaurants and are available only in local restaurants owned by fishers, as in the case of Khun Duen. As small-scale fishers, she and her husband fish in the nearshore area, not far from where the restaurant is located. According to her, Samut Sakhon Province

⁵ ‘Khun’ is a polite, gender-neutral prefix for a Thai person.

4. ALL ABOUT 'KAPI'

is a very abundant place, often referred to as 'Bangkok Gulf,' and is full of excellent quality krill.

Kapi is well known among Thais and is used as a key ingredient in many dishes. Many fishing villages boast that their kapi is the best and they compete to gain that recognition. According to Khun Duen, her kapi is the best because of the high-quality krill that they can find in the province. She further explained that the high quality krill is linked to good habitat, which is the muddy bottom of the ocean. Krill from other provinces live in a mixture of muddy and sandy habitat, which does not result in the best tasting krill. Khun Duen also said that well known kapi, like those coming from Mae Klong and Trat Province, are made from krill that is ordered from Bangkok Gulf, which produces a paste of exceptional quality. People also buy kapi from Khun Duen and put their own brand on the product to suggest that it comes from local areas. One thing that we noted as markedly different from other kapi we have seen elsewhere is the packaging of Khun Duen's kapi (Figure 1). Instead of the common cylinder-like jar in the top photo, her kapi is packaged in an interesting looking jar, with the brand 'Duen Toh Deaw' on the front (Figure 1, bottom left), with the text on the back that says 'Real krill kapi', produced by Duen Toh Deaw (with address), and lists the two ingredients: 95 percent krill, 5 percent salt. No wonder her kapi is very good. We tasted many dishes prepared using kapi that day, and bought a few jars to bring home.



Figure 1. Duen Toh Deaw kapi is a unique product compared to other brands.

Credit: K. Rungruengrayup, May 2019

Duen Toh Deaw's kapi is a homemade product made by local people, which is different from products made in a factory. The local fishers catch their own krill, which makes it special. They also make a small quantity of kapi based on the availability of the raw material. It is less certain where krill used in the large-scale production of kapi are from, as we later learned.

In addition to talking proudly about her kapi, Khun Duen mentioned how fishers in Samut Sakhon face many challenges related to the new Fisheries Act (2015) and other regulations issued by the Department of Fisheries, some of which favour large-scale fisheries and ignore small-scale. This is one of the reasons why fishers remain poor, explained Khun Duen. There is also the issue related to the use of a small push net for krill, which is considered by some people to be destructive. This is because push net is a bottom-tending gear, and thus can damage the seafloor and the benthic ecosystem. According to Khun Duen, fishers who earn their living by fishing also care about the ecosystem and the population of fish in the sea. In effect, it is in their best interest to keep the sea as healthy as possible, and they won't be using destructive fishing gear for that reason. Under the current regulation,

the common push net is banned but the Acetes push net is still allowed. Questions and issues related to the new law and regulations require further investigation.

Many shapes of kapi

As we continued with the field research, it became evident that the small-scale production of kapi takes place in many villages in several eastern and southern provinces of Thailand. Kapi is also available widely in local markets, groceries and supermarkets across the country. The markets in Bangkok carry kapi from all the famous sources, from the eastern provinces and the south. It is interesting to note that kapi from Rayong Province, which is well known for its high quality, can be found in many shops in the south, along with those produced in the southern provinces and the local kapi (which may not have a brand or a label). One of the vendors that we visited was actually busy putting her own label on the red-top jar. It is there we learned that kapi sold in a typical red-top jar with different brands and labels may in fact be coming from the same place.

Figure 2 shows a variety of kapi that can be found in a shop. In addition to kapi sold in jars, customers can buy it by weight, which is cheaper but perhaps not as convenient. For those not familiar with kapi, the smell might be overpowering. The taste, colour and smell of kapi are the key selling points. Many shop owners would advertise their kapi using its purity, that it is made from 'real krill', not so salty, and without additives (such as MSG or food colouring). The white top kapi is different, it is referred to as 'kapi waan' (or sweet kapi), made from small shrimp, not krill. The shrimp is not blended into a paste, but the whole shrimp, including the eyes, are visible. Unlike the regular kapi, the sweet kapi is eaten directly with freshly steamed rice, not as an ingredient in other dishes. Sweet kapi is slightly more expensive than the typical one.



Figure 2. A shop in Trang province selling different types of kapi. Credit: S. Traesupap, March 2021

‘Bung Mead’ kapi is everywhere

In Phangnga and Krabi Provinces, we started to see many shops selling a brand of kapi called ‘Bung Mead.’ There is nothing special about it, but this particular brand caught our attention, possibly because of the name. We have seen many kapi being branded using a woman’s name. This time it is not only a male name, but an Islamic man. ‘Bung’ is a prefix used in an Islamic culture in Thailand to show respect to an elder man.

We decided to visit Bung Mead and his ‘kapi factory’ in Krabi province, and learned about the large-scale production of kapi. Bung Mead was a very friendly middle-age man, and both he and his wife were chatty and happy to share information about his business. He started from the most important aspect of kapi making, which was about the source of Acetes shrimp. He buys them from Mahachai (Samut Sakhon Province), as well as from the nearby provinces, Nakon Sri Thammarat, Songkhla and Ranong. He mentioned that Thai shrimp are of higher quality compared to those from other countries, like Indonesia, and thus he’s not buying from them. Bung Mead was a fisher

4. ALL ABOUT 'KAPI'

and had his own boat, but later he switched to shrimp farming, which sent him heavily into debt due to low shrimp prices. In the year 2000, he quit shrimp farming and started the kapi making business, which has enabled him to pay off his debt.

Kapi making is a simple process, according to Bung Mead (Figure 3). He orders the shrimp and has them delivered to his factory by truck. At this point, the shrimps are semi-dried and they would need to be dried for a couple of hours in the sun before they are sorted by size, and also for the heads to be removed. The sorted shrimp are then sieved and grinded by a machine. Sugar and food colouring may be added for the taste and the appearance of kapi. Once done, kapi is ready for packaging in a jar with his own label, or packed in a large plastic bag (10 kg) for delivery to buyers, who will then fill the jar themselves and put their own label on it.



(1) Sorting after drying



(2) Grinding with a simple machine



(3) Flavoring and packing for bulk sale

Figure 3. A simple process of making kapi for large-scale production. Credit: S. Traesupap, March 2021

Bung Mead hires 15 people (mostly women) to help with kapi making from Monday to Friday. They get paid differently, depending on what they do. For instance, the shrimp sorters receive 2 baht (about USD 6 cents) for each kilogram of shrimp sorted, while the packer gets 1 baht for every jar filled. His four children also help with the business, mostly with the distribution and marketing. They have 5 pick-up trucks to deliver kapi to nearby destinations, upon receiving orders. For destinations further away, they use delivery and postal services.

Microplastics in kapi

In addition to buying kapi from the vendors we came across (in order to check which one was really the best), the kapi samples were also collected for a study about microplastics conducted by a DFM partner in Thailand, the Marine Biodiversity Research Group (MBRG), Ramkhamhaeng University. The results of the study (Sutthacheep et al. 2021), published in *Ramkhamhaeng International Journal of Science and Technology*, is the first of its kind. The research team found different densities of microplastics in the kapi samples from seven locations, ranging from 6 to 11.3 particles/10 g (Figure 4). The presence of microplastics in kapi raises some health concerns and needs to be properly addressed. The MBRG research team is working in collaboration with local communities to conduct a pilot project to improve the production process, mainly related to cleaning of the raw materials in order to reduce microplastic contamination.

4. ALL ABOUT 'KAPI'

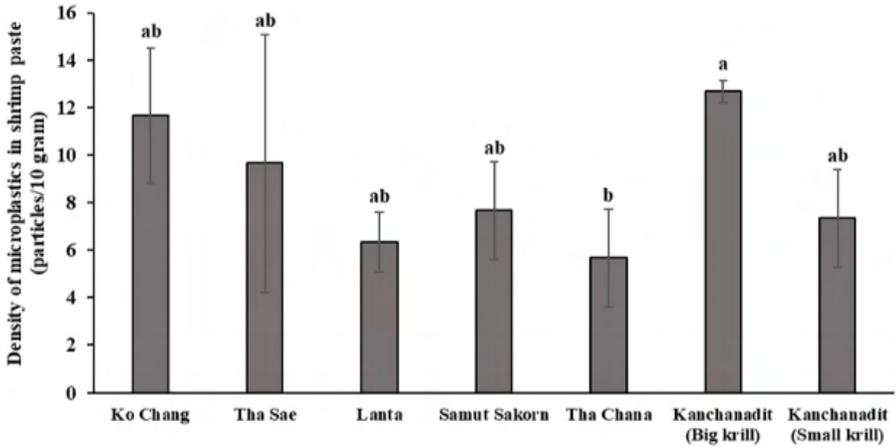


Figure 4. Accumulation of microplastics in seven samples of kapi. Source: Sutthacheep et al. 2021; reproduced with permission from authors

Kaeng Som/Lueng and nam prik kapi

Kapi is one of the staple ingredients in a Thai kitchen. Many types of curries have kapi in the paste, although it may not be detectable because it is often blended with other ingredients and flavour. A curry called 'Kaeng Som' (spicy sour curry), for instance, has kapi as one of the ingredients. This particular dish is worth mentioning because of its popularity among Thais, and the versatility of fish and vegetables that can be put in the soup. The southern version of the curry is also distinct, with the use of turmeric, which makes the curry yellow instead of orange (or 'som'). Thus, the southern spicy sour curry is called 'Kaeng Lueng', and not 'Kaeng Som' (Figure 5). The southern soup is usually very spicy, but in both cases the soup is meant to be eaten with steamed rice. In addition to kapi, the curry paste includes shallot, dried red chilies, and a bit of salt, and turmeric for the southern version. The sour flavour comes from fresh tamarind. Fish or shrimp are usually added to the soup, along with assorted vegetables such as water spinach, green papaya, string beans, cabbage, cauliflower, and any other vegetables as desired. The soup is therefore rich with protein and vitamins, making it a healthy dish

with high nutritional value.



Figure 5. Kapi is one of the key ingredients in this nutritious spicy and sour soup.

Source: image on the left:

http://healthfirstchoice.blogspot.com/2017/01/blog-post_22.html; image on the right: <https://www.wongnai.com/recipe/southern-yellow-hot-sour-soup/>.

Despite the popularity of the spicy and sour soup, the best-known use of kapi in cooking is in the making of nam prik, which is basically a chili paste made from kapi, chili and garlic, flavoured with lime juice and palm sugar. Nam prik is commonly consumed with fried Indian mackerel and fresh vegetables as shown in Figure 6.



Figure 6. Nam prik kapi is a traditional dish in Thailand, accompanied by fried Indian mackerel and vegetable. Credit: R. Chuenpagdee, March 2021

Reference

Sutthacheepa, Makamas, Supphakarn Phoaduang, Charernmee Chamchoy, Wanlaya Klinthong, Chakkrit Salakphet, Aphaiphum Silparasarn, Duangkamon Sangiamdee, and Thamasak Yeemin. 2021. "The Particles of Microplastics in Shrimp Paste from the Gulf of Thailand and the Andaman Sea." *Ramkhamhaeng International Journal of Science and Technology* 4, no. 1: 27-34.

5. Local Stories of the Global Anthropocene: A One-day 'Adda' With the Fish Dryers of the Sundarbans Delta

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Prologue

Adda, in Bengali, implies colloquial on-site conversations where some people in a community or between communities gather in a friendly manner to discuss various issues at length. More specifically, *adda* provides a space for open-ended, slow-paced conversations inviting storytelling, anecdotes, and dialogues, such as the kind that takes place between friends and neighbours. As pointed out by Srinivas in his lectures of 1945 (cited in Sen 2021), a researcher must consider the relationship and moral dimensions with the chosen community in the research. This is primarily because the natural behaviour and worldviews of marginal communities cannot be learned simply through interviews and quantified information (Madan 2004). By dissolving the frontiers of 'insiders' and 'outsiders' through prolonged exchanges in groups, *addas* are expected essentially to produce a congenial climate for deepening cultural connections and relationships between the community and participant researchers.

A few days before we started the fieldwork, diverse ideas sprouted up as we intended to have an immersive conversation with the women fish dryers of the Frasergunj village in Indian Sundarbans. Given our existing cultural bonds with the community, an *adda*, we felt, would allow us to dive deeper into their life stories. We were strongly motivated to be sincere listeners to whom they could not only vent their exasperation, anguish, and grievances but also share good feelings, stories of the family, memories of contentment, and cultural-spiritual beliefs. With such an ambition, an ‘immersive *adda*’ was conducted with twelve women fish dryers who labour in the Lalgunj shabar. Our long, cordial conversations and good rapport permitted us to know them better through the diverse storylines of their lives, livelihoods, and (p)liabilities. Sounds of fear and heavy sighs often infused the air as they began divulging their memories of disaster aftermaths. Thus, the *adda* that started in the morning, flowed and followed until the mid-day sun.

Walking the coastline

On a dazzling November morning, we took the winding trails across the quaint Lalgunj village at the western part of the Indian Sundarbans (Figure 1). Along both sides of the muddy trail, we observed small huts accompanied by vegetable gardens and ponds. Who could say that these households, plants, and inhabitants of the village endured the fury of an aggressive Cyclone Yaas in the recent past (May 23, 2021)? With strong blasts of unruly winds, trees were uprooted and ponds were engulfed with seawater when embankments collapsed to blur boundaries between concrete and clay.

DRIED FISH MATTERS

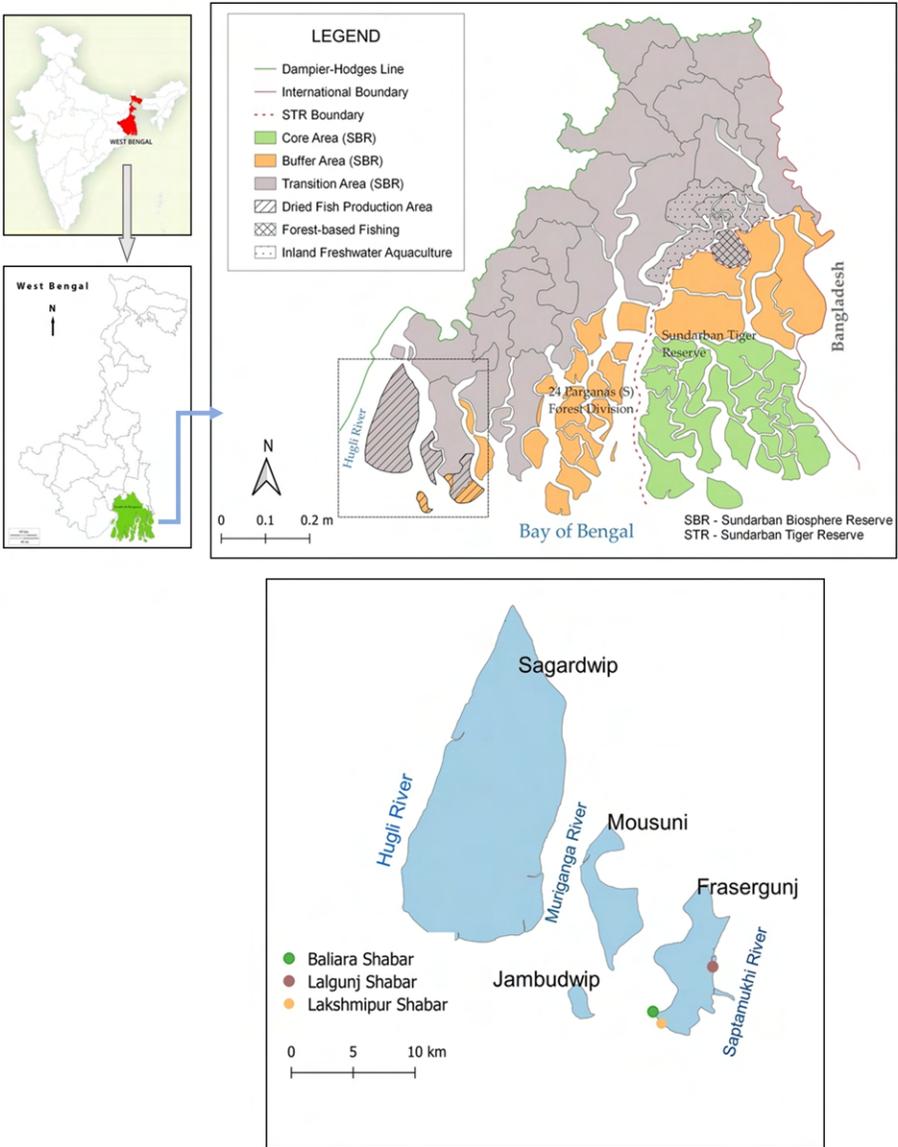


Figure 1. Lalgunj shabar in Frasersgunj, Indian Sundarbans. Source: Raktima Ghosh

Today, the clear blue firmament enlivens every activity in the village but who knows for how long. A piercing fear of uncertainty loomed large on us as

we kept walking near the shore. Right after traversing across an abandoned dried fish site, the narrow trail unwrapped a wide coastal floor, perpetually washed by the murky waves of the Bay of Bengal. Unable to mark off the horizon in the watery expanse, our attention was soon seized by a number of boats and trawlers that were gliding along the river mouth. On the other side, we quickly traced an array of dried fish camps locally known as shabar, thanks to the dry winter months when the coastline of Bengal bustles with fish processing activities. As we paused to take some photographs, one of our team members suddenly instructed us not to miss the sight of Meendhara by two young girls and their mother who looked dreadfully indigent. In Bengali, Meendhara implies catching juveniles of tiger shrimp or *bagda meen* from the turbid waters off the shore. We were interested to get a first-hand glimpse of the process. But, the awareness that 10-15 women dry-fishers were waiting to meet us at Niranjan babu's large shabar prompted us to go to the adda site. Yet, we stopped again right in front of our destination. Fresh fish was being unloaded by the fishers who returned after a five-day long deep-sea voyage. We were captivated by the flow and rhythm engendered by the process of fish transfer from one hand to the other and finally, to the manually driven cart which takes the fish to the shabar yard – the site prepared with layers of net and straw that help to retain a desirable heat for the fish (Figure 2).



Figure 2. Fish is spread over the drying yard in Lalgunj shabar. Credit: Swarnadeep Bhattacharjee & Aishik Bandyopadhyay, 2021

As we finally reached the shabar, a strong pungent odour touched our lungs and welcomed us to the zone of dried fish. The yard was adorned by bamboo scaffolds, accommodating *bomla* (Bombay Duck), and Ribbon fish for drying in bundles. Under the glaring sun, a group of about 15-20 women was sitting with cane baskets and separating fish into different varieties from a mound of dried fish (Figure 3). As we moved closer to observe their work, we could spot a balloon-like wrapper on their fingers. Upon inquiry, a woman replied in a thin voice, “*We wear this in order to protect our fingers from the sharp teeth of bomla.*” A fading smile was in her face as she glanced at us. We understood that these were needs-driven protective gear, innovated by them in the absence of more effective tools.

We came across a temple idol; a *pradip* (earthen lamp) was lit and a pleasant aroma of *agarbati* (incense) was infusing the air around it. The shabar manager told us that Ma Ganga (Goddess Ganga) is worshiped by the dry fish crew in every shabar aiming for a hassle-free day. “*Ma Ganga protects the fish. We pray to her to look after the fish. We cannot survive without fish.*”, he asserted. While strolling around the site we saw some fishers knitting behundi jaal

(bottom-set bag net), a key gear used in deep-sea fishing, with amazing speed and concentration manifesting their skills, expertise, and attachment to the process. “I used to fish long before. Now I am old and my sons go for fishing,” an elderly, experienced fisher in the group revealed to me.⁶ Soon after, we met a large number of women and men who convened from different parts of the delta. With a messy assemblage of thoughts and multiple questions, we finally entered a large room, geared up for the adda.



Figure 3. Our adda partners are busy sorting dried fish. Credit: S. Bhattacharjee & A. Bandyopadhyay, 2021

Meeting the hajira workers

Stepping inside a shadowy room, our gaze was immediately captured by the curious yet sparkling eyes of twelve women. Together we sat cozy on a raised couch – the height indicating its importance in keeping away floodwaters during cyclones or heavy rainfall. The meal for the day was being prepared in an attached kitchen. However, the meal was only for the committee members

⁶ Here ‘me’ implies the first author Ghosh.

of the shabar, including the owner, managers, and male workers inhabiting the shabar during the entire dry fish season of four months (November to February). We were uncomfortable with this arrangement but suppressed our thoughts for the time being. The adda began (Figure 4).

We were sitting with women *hajira* labourers who are tasked with fish cleaning, sorting, binding, and tending dried fish with the help of self-innovated artisanal tools. Here, *hajira* implies that they are hired by the owner on 'no work no pay' basis. Most of them commute daily by foot from their native places in Pathar Pratima and Kakdwip blocks to the shabar. Some of the workers who stay in the shabar during the winter live in tiny, frail shacks, and prepare their own meals twice a day. Women fish dryers of various ages joined us in the adda: five women were likely between 20 and 40 years of age whereas the rest of them were either in their 50s or 60s. Oftentimes, they belong to the same family; the mother-in-law tutoring the daughter-in-law about the use of tools, different types of fish, sorting processes, and other tricks of the trade. They consider this inter-generational transmission of knowledge crucial as it facilitates their collaborative work. Their age-old and daily saga of struggle came out sharp through their weary eyes, deeply buried in their face, scratched hand palms, and tattered sarees. The details were readily visible even in that dimly lit room.



Figure 4. Our 'adda'. Credit: S. Bhattacharjee & A. Bandyopadhyay, 2021

Gendered renderings of disaster

Overturing the adda was not difficult as we smiled at each other – “*We are grateful to have you here amid this busy hour in the shabar! We are here to know how you are and whatever you would like to share with us.*”, someone among us expressed.

“*Ei to cholchhe. Amra sokale aashi, ekhane kaaj kore bikele bari jai.*,” replied Sandhya in a meek voice. (“*Life is moving on as usual. We come here in the morning, labour for the whole day and return back to home in the evening.*”). Sandhya and her mother-in-law, Rina, who is in her 60s, travel daily from the L-Plot village of Pathar Pratima block. Sandhya’s boy Deepak (10 years) has been accompanying her these days as the schools are now closed due to the pandemic. Her husband is a deep-sea fisher, employed in another shabar in this village.

“*How do you come here every morning?*” we asked curiously. In an almost chorus note, we heard, “*We come here by walking from home.*” Sumi added despairingly, “*Have you seen the creek towards the north of the shabar? We swim the creek every day. It looks dangerous during the high tide.*” Sumi has been

working here for five years now. She lives with her 14-year-old daughter after losing her husband who used to work as a daily labourer in Andhra Pradesh, two years before. . Her weary, yet evocative eyes repeatedly struck me, and I asked her, *“After all this, is everything going well?”*

“Everything has to go well; otherwise how will we survive here? I earn only Rs. 250⁷ per day and take care of my mother-in-law and daughter. But ravaging cyclones sweep everything including our mental strength.” Echoing her, Miloni added, *“We suffered a lot during Aila, Amphan, and Bulbul cyclones. Our houses were destroyed.”* When she observed water gushing landward menacingly through gaps in the river bank that was hit by the strong blows of Amphan, she rushed towards her neighbour’s house with her two children and some food. Miloni was living alone as her husband had gone to the city for over a month. *“When I returned to the house after few hours, a part of it had collapsed. I searched everywhere amidst the winds but could not find my cattle.”*

Hewitt (1983) rightly noted in one of his studies that disasters are imposed upon traditional societies by the industrialized world and their effects depend upon the social order, demographic patterns, everyday relations to the habitat, and broader historical circumstances shaping situations. Such intensive cyclones are not new in the Sundarbans and the degree of devastation is well known to the elderly people of this ‘reclaimed’ land; what is prominent is that the compounding effect of cyclones with other environmental changes and socio-political burdens are significantly revealing the social challenges and transformations of human-nonhuman relationships.

The women repeatedly reminded us of the impacts of the 2009-cyclone Aila, which was the most severe in terms of magnitude. They appeared as a choir of women – each of them drawing out from someone else’s string of words, inserting her own expressions, and weaving the whole story together. Sitting next to Sumi, Fatima remembered the aftermaths of Aila, *“I remained in complete bewilderment as the hut started trembling amid the rising floodwater. I was running to protect the little livestock we had.”*, she muttered with her lips moving rapidly. I tried to understand whether Fatima meant that her wellbeing was

⁷ Rs. 250 is equivalent to around 4.10 CAD or 3.00 USD

intimately related to the cattle as she risked her life for protecting the animals who shared the world with them. How does this relationship look and how far is it from the life on the 'mainland'? How do they tie the knot between these many worlds? How is this companionship touched by the twenty-first century effects of globalization? This set of questions would again stir up during the lazy afternoon while we would be scrolling the computer screens, I thought. As I reflected on their words, I understood that being related in this vulnerable archipelago certainly means to endure the difficulties together, to be incapable of fully protecting oneself against shocks, to be dependent and at the same time, independent.

Vandana's husband cultivated fish in their own household pond. This sole freshwater fishery asset was damaged by salt-water incursion. They say 'time heals everything' – thousands of fish dryers and fishers like Vandana and her husband have learned 'tactics' of adaptation from their experiences of cyclone impacts. Michel de Certeau (1984) distinguished between 'strategies' and 'tactics.' While 'strategy' is a structured practice of relatively powerful actors aiming to create control and impose stability over local conditions, 'tactics' is the 'art of the powerless' who deal with uncertainties by depending upon the possibilities of prevalent circumstances (de Certeau 1984, cited in Ivars 2020). Vandana's husband restored the pond with his unceasing efforts over two years. After removing the saline water from the pond and adding an appropriate amount of *chun* (lime), the pond was left fallow until the monsoon that fed the pond freshwater, the foremost requirement for fish cultivation. Like many households, they had to rebuild the hut with their meagre savings – after all, everyone cannot earn the fortune of the Pradhan Mantri Gramin Awas Yojana⁸ housing scheme of the Central Government.

⁸ The National Rural Employment Guarantee Act 2005 (NREGA), later renamed as the "Mahatma Gandhi National Rural Employment Guarantee Act" (MGNREGA), is an Indian labour law and social security measure that guarantees the 'right to work'. The act was passed in 23 August 2005 under the former UPA government of Prime Minister Dr. Manmohan Singh. Under the MGNREGA scheme, Pradhan Mantri Gramin Awas Yojana (previously Indira Awas Yojana) was relaunched in 2015 by the current government to provide housing for rural population in India.

The homes that they built after Aila were destroyed within hours by the squalls of Amphan in May of 2020. The fishers were evacuated to a nearby hotel by the local police administrators in the aftermath of the disaster. While the national lockdown for containing COVID-19 pandemic was already testing their adaptive capacity, the constricted space was the only opportunity available for their survival until the cyclone dissipated. However, the following day did not bring any relief – huts were flattened, cattle were missing, tube wells were broken, all routes were flooded (Figure 5). With inadequate food and water, they held on without eating anything, only managing to gather something for their children.



Figure 5. Tube well destroyed by Cyclone Bulbul. Credit: S. Bhattacharjee & A. Bandyopadhyay, 2021

A dense silence suddenly took hold in the room. Somebody brought us tea. My eyes moved to Shikha’s 24-year-old daughter Puja, who had remained silent until now as I almost whispered to her ear, “*Where is your home?*”

“Me and my mother stay here in the shabar. Our home is in an interior village of Kakdwip.”

5. LOCAL STORIES OF THE GLOBAL ANTHROPOCENE: A ONE-DAY...

Puja is learning from her mother and grandmother how to hold the *patta* (a traditional knife-like tool made of bamboo, used for sorting and separating dried fish), to flip the fish to get the confirmation that fish has been dried properly, and how the bomla needs to be placed on bamboo racks. Her grandmother has been practicing these skills for 10 years now.

“What happens here during rainfall, Puja?”, I wanted to know. *“We live in one of the shacks you may have seen outside. Heavy showers in winter inundate the shabar yard including our shacks and ruin the fishes.”*, she lamented. *“Foul odour of rotten dried fish makes us sick”*, Shikha added. The unwelcome November storms confirm the increasing trend of a tropical depression transforming into a powerful cyclone in Bay of Bengal. However, the shabar yard, including the shacks, gets flooded for at least seven days once the heavy rains inundate the shabar (Figure 6). This dreadful situation is further revealed by the inadequate sanitation facilities for women in the shabar.

“There is knee-deep water everywhere, be it our house or the landing site.”, Shikha said.

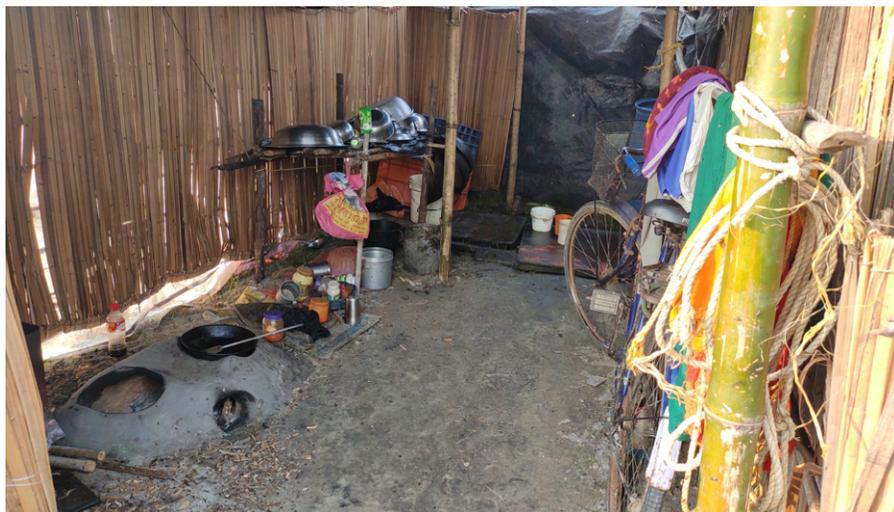


Figure 6. Inside a kitchen in the shabar. Credit: S. Bhattacharjee & A. Bandyopadhyay, 2021

While cyclonic surges shatter all arrangements in the shabar to refurbish it again, erratic winter rainfall spoils dried fish, which affects the profits of the owner. All these complexities finally end up curtailing the wage rate of the hajira workers. On the other hand, deep-sea fishing often claims fishers' lives as the boats are swamped by huge tidal waves, driven by sudden storms. In the Sundarbans, there are many widows whose husbands were lost to such storms in the sea. Repeated storm strikes lay bare the uneven, gendered vulnerabilities arising within the interactions between climate change induced disasters and sociopolitical complexities in the region. The degree of vulnerability has reached the tipping point with the unfolding and intensification of the trafficking of women by both men and women traffickers, especially in the Kakdwip areas of Sundarbans.

"As if the sea is advancing towards us to eat away the lands." observed Vandana.

"It was not like this before. The char outside the shabar, once used to be a paddy field.", chipped in Yasmin Begum, 62 years old. By 'char', she meant the silt deposited land erected by the sea.

"Do you receive relief after the cyclones?"

"We haven't got any relief after the most recent Bulbul and Yaas. In some villages, tarpaulins have been distributed to communities." replied Puja. *"We need concrete, disaster-proof shelters where we can dwell during cyclones. Our houses are too weak."* Vandana said.

Stepping out and stepping in the (un)told frontiers

Lives, there, are so connected that the ramifications of destruction in one's life can touch other's lives and thus, they accumulate experiences which help them to prepare for future impacts. We felt how the conversations initiated our journey with them along their stories of a 'shared reality', relatedness, and enactments. The afternoon sun emerged stronger, the fishers again headed towards the sea and our partners in the adda started getting ready to go back to work. We returned from the site silently as if all our ideas of the women's lives in this delta have been muddled up so that we can reinvent them in

more sensible and responsible ways. At the same time, we could relate to how the narratives of local lives keep rolling around (in)visible uncertainties and resilience amidst all that provides impetus to the growing complexities, debates, and decisions of the Anthropocene.

Acknowledgments

We are grateful to the women fish dryers of Lalgunj dried fish camp for generously spending time with us and remaining patient to our continuous probing during the adda. The Dried Fish Matters Project (<https://driedfishmatters.org/>), undertaken by University of Manitoba and funded by SSHRC (Canada), sponsored the field investigation in Frasergunj village. We are thankful to Mr. Narayan Das, Mr. Milan Mondal and Mr. Pradip Chatterjee of Dakshinbanga Matsyajibi Forum (DMF), our NGO partner in this project. We acknowledge our internal team of IIT Kharagpur comprising Dr. Anuradha Choudry, Ms. Shreyashi Bhattacharya and Mr. Souradip Pathak. We are thankful to Mr. Swarnadeep Bhattacharjee and Mr. Aishik Bandyopadhyay for taking photographs for us during the adda.

References

- Certeau, Michel de. 1984. *The Practice of Everyday Life* translated by S. Rendall. Berkeley, CA: University of California.
- Hewitt, Kenneth. 1983. *Interpretations of Calamity from the Viewpoint of Human Ecology*. Boston, MA: Allen and Unwin.
- Ivars, Benoit. 2020. 'Alluvial Tactics: Land Access and Control on the Ayeyarwady River.' *Journal of Burma Studies* 24, no. 1: 37–78. <https://doi.org/10.1353/jbs.2020.0003>

6. Residing With Risks: An Everyday Narrative of a Woman Fish Dryer in the Indian Sundarbans

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Jharna works as a ‘hajira’ labourer⁹ at the transient dried fish camps (locally called ‘shabar’) in the Baliara and Frasergunj villages of South 24 Parganas district in West Bengal. She works at various shabars, run by local dried fish producers who are also well-off fishers in the Namkhana block. She is involved in sorting and drying activities of raw fishes with her indigenous sorting tool locally called ‘Katani’ and a large round basket local called as ‘Jhuri’ for stockpiling the sorted ones. Jharna mentioned that she has acquired the mastery of such unique artisanal skills from her ancestors who were also involved in the same profession. In a shabar, they usually plunge into sorting out Bomla (Bombay duck) from the mound of fishes as soon as the male workers unload the crate of raw fishes from the trolleys. Then the fishes are bundled carefully and left hung in the bamboo racks in uniform arrays to dry them in the sun. Also, they separate other species including ribbonfish (fitey maach), honey gourami (chuno maach), gangetic hairfin anchovy (fyasha maach) and prawns from the large piles of marine catches. A long shift of

⁹ Contractual daily wage labourer in the dried fish camps.

eight to ten hours a day at the shabar earns her INR300 (USD 3.68) in Baliara.

Jharna arrives at Baliara shabar by six in the morning from Bokkhali, situated in proximity to the shabar. The shabar committee has her contact number, like all other hajira workers. More often, the hajira fish dryers are called upon by the owner of the shabar if there is an excessive amount of catch that requires extra labour. As Jharna belongs to a neighbouring village, she pays a visit to her home during the breakfast hour to manage a part of household tasks and then returns to the shabar by 10 AM. Shankar, her husband, is a deep-sea fisherman and therefore spends the bulk of his time on trawlers. Both her father-in-law and mother-in-law are old and they prefer to live with their younger son Shankar in their thatched homestead in Bakkhali. They have two children who are usually looked after by her mother-in-law. Jharna often prepares lunch for her family as she visits home during breakfast. When Shankar returns to the household, Jharna has at least some assistance with household chores, otherwise she has to make arrangements during the lunch hour. Most of the time, she brings her lunch from home and finishes it within 10-15 minutes at the shabar, so that she can maximize the lunch break through engaging herself in overtime work and secure an additional payment of INR 120 (USD 1.47). Jharna mentioned that, in the past, their daily payment was INR 260 (USD 3.19), which has increased as a result of unceasing efforts of deep-sea fishers and dry-fishers under the banner of Dakshinbanga Matshyajibi Forum¹⁰. In general, their daily activities continue until 5 PM, except for the late attendees who have to meet their daily quota after five through overtime work.

Jharna alleged that their wage is not satisfactory in terms of labour invested in their daily activities in comparison with the daily wage of labourers from other unorganized sectors who get at least a sum of INR 500 (USD 6.13) daily. Women hajira workers in a shabar are usually paid in cash once the packaged dried fish are dispatched to the retailer. The shabar committee further deducts INR 10 (USD 0.12) per day from each of them out of their

¹⁰ Dakshinbanga Matsyajibi Forum (DMF), an independent state organization of National Fisheries Forum (NFF), India.

daily wage of INR 300 (USD 3.68) daily. Jharna added that they are in seeking to raise their daily wage to INR 310 (USD 3.80) to attempt to at least a round figure of INR 300 (USD 3.68), excluding the committee's deduction.

In recent times, marine fish production has witnessed a gradual drop, severely threatening their job security. Moreover, there is no provision for women dried fish workers to be employed as permanent contractual workers for the entire dry fishing season (October to February). This is one of the glaring needs of the hajira women labourers like Jharna. She despairingly mentioned that they are compelled to accustom themselves to such an arduous profession due to a lack of opportunities in the region.

There are some women self-help groups operating in the Sundarbans, engaged in activities such as culturing saplings for nurseries, tailoring work, hatching freshwater aquarium fish, and puffed-rice production. However, funds are disbursed on the basis of political affiliation and favouritism, which unfortunately fails to offer access to income generation for a majority of the local women. The same problems occurred with the distribution of Panchayat¹¹ job cards introduced to permit local women access to employment as daily wage labourers in various government job security schemes. According to Jharna, such political dynamics compel the local women hajira workers to secure a significant proportion of their annual expenditure from a single fish drying season, which lasts only for a span of four months. Since their capacity to afford essential commodities has decreased over the last 10 years, the reality turned very grim for dried fish workers like Jharna in their efforts to secure a nominally decent livelihood. Moreover, their inland aquaculture was severely damaged due to the incursion of saline water and all the livestock (2 cows, 10 ducks and 30 chickens) died in the aftermath of the recurrent cyclonic floods (Cyclone Bulbul 2019; Cyclone Yaas 2021), after which they found themselves living in a ravaged homestead, faced with numerous stressors threatening their livelihood. Jharna also revealed that during the cyclones the local people had been moved to the nearby hotels in Bakkhali and flood shelters located at Bijaypati and

¹¹ The lowest stratum of three tier democratically elected rural governing apparatus in India.

Debnibas in Frasergunj during the cyclones. The local administration usually takes responsibility for such operations. In the post-disaster phase, Jharna's community faced widespread discrimination in provision of disaster relief as they lack sound political connections with the ruling party. Jharna told with grief that they did not receive the government compensations allotted for household damage due to cyclones. They had to remain content with a single tarpaulin sheet and dry food packets weighing 250 g for each household. Their family had to depend on an NGO run community kitchen for over a month after cyclone Yaas (2021) and received a small amount of groceries from some other NGOs. Moreover, COVID-19 had dismantled the normalcy and job security in their locality. During the entire lockdown they had to rely solely on government rations. Jharna stressed that apart from that, each of the families were given only one mask and one small container of hand sanitizer on behalf of the government.

Jharna stated that they live under consistent fear of cyclones and coastal floods. Once a disaster alert is received, they have to rapidly leave their place with their essential documents and move to safe shelters, with their children and elderly family members. Jharna described how the river, once being revered as the principal source for their livelihood, has been turning out to be an emblem of day-to-day risk in the wake of recurrent storms generated by frequent coastal floods. Their thatched home is next to the embankment. Meanwhile, the river is gradually approaching, and the nearest embankment has not been effectively maintained for over a year. Moreover, they had to borrow a sum of Rs. 30,000 to repair the damage inflicted due to cyclone Bulbul in 2019, but that was spent mostly during the lockdown because they had no other earning options left. Now, both Jharna and her husband Shankar are working hard so they can acquire at least a moderate amount of cash to return the borrowed money to the money-lender, and also to be able to conduct some basic repairs on their ravaged house. While narrating their day-to-day saga of living with the fear of cyclones in a high-risk coastal area, like the Indian Sundarbans, Jharna promptly admitted that they would prefer to migrate if they could find a sound relocation offer from the Government. Jharna concluded, with a gentle smile on her skinny face,

DRIED FISH MATTERS

that the term 'Sundarbans' literally means 'beautiful place' but that essence of beauty ironically gets altered for the millions of inhabitants like them who are dwelling amid the risks posed by erratic weather.

7. Dried Queenfish With Coconut Milk

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Summary

Sri Lanka is a multicultural country with a high diversity in all aspects of living, including the culinary arts. Cooking styles are distinct not only among ethnicities but also vary from region to region, community to community, and person to person. Sri Lanka has its own unique and traditional cuisines using coconut milk and spices. These recipes have been practiced since time immemorial. A recipe for the preparation of dried queenfish (*Seriphus politus*) in spicy coconut milk is shared in this chapter.

Introduction

Dried fish curry with coconut milk is a very popular dish prepared in every household irrespective of social status and income level in Sri Lanka. The curry adds animal protein, as well as a spicy, gravy texture to a rice meal. I learned this recipe from my grandmother when I was a 13-year-old schoolgirl. My grandmother came from the Gampaha district in the western interior part of the island, so this recipe might be more characteristic of this region.

First, I watched her as she prepared the curry, asking thousands of questions.

The next day she watched me as I prepared the curry, instructing me to get the process and ingredients right. Since that day, I often made this curry when I cooked with my mother and I now prepare the same dish to serve to my kids. My grandmother used to add tomatoes to the dried fish curry – this is commonly practiced by many families as it adds a delicious tangy flavour to the dried fish. The recipe illustrated with my photographs is as follows:

Ingredients

- 150g dried fish (queenfish, skipjack tuna or other available small or large fish varieties – cut into pieces)
- 1 medium size potato (optional)
- 2 tomatoes
- 1 sliced big onion
- 2 sliced green chillies
- 2 sliced cloves of garlic
- A few curry leaves
- A few pieces of pandan (screwpine) leaves
- ½ teaspoon chilli powder
- ½ teaspoon curry powder
- ½ teaspoon turmeric powder
- ½ teaspoon black pepper powder
- 2 cups of coconut milk ¹²
- Salt (if needed)

¹² Preparation of fresh coconut milk

Scrape a half of a coconut. Squeeze the scraped coconut flakes by adding a cup of water. Strain the slurry and separate the thick coconut milk. Squeeze the residue with another cup of water and strain into a thin milk. Now two sets of coconut milk of different dilutions have been prepared.

Note: Canned or powdered coconut milk can be substituted for fresh coconut milk.

7. DRIED QUEENFISH WITH COCONUT MILK

This recipe serves four people with rice and accompanying vegetable dishes.

Preparation

Cut the dried fish into small cubes and rinse well with water. Put the washed dried fish cubes into a pan (Figure 1¹³).



Figure 1

Peel the onion and wash. Cut them into slices (if you wish to add potato, peel the potato and add small cubes into the pan). Cut the tomatoes into four/six pieces and add to the mix. Cut green chillies, garlic, curry leaves, and pandan leaves into pieces (Figure 2).



Figure 2

¹³ All photos in this chapter were taken by Dilanthi Koralagama in 2021.

DRIED FISH MATTERS

Add all dried fish cubes, (potato cubes), onion, green chillies, garlic, curry leaves, pandan leaves, chilli powder, curry powder, turmeric powder, and black pepper powder and mix well. Season it for a few minutes (Figure 3).



Figure 3

Add one cup of coconut milk from each set (set 1 and 2) until it covers the dried fish cubes and mix well (Figure 4).



Figure 4

Close the lid and bring to boil in medium-low heat for 5-6 minutes (Figure 5).

7. DRIED QUEENFISH WITH COCONUT MILK



Figure 5

Stir the curry from time to time for even cooking and to make sure the spices are mixed. Add salt as needed and stir well. Cook for another 2-3 minutes without closing the lid (Figure 6).



Figure 6

8. Trawling the Shutki Tidalectics: Short Narratives From Fish Drying Womenfolk of Frasergunj, India

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We waved back at the women from far away, who were still huddled in a group, looking at us, as we kept walking on the sandy beach towards home. The sand in front of us glittered under the warm sun, with red crabs crawling out of it incessantly towards the sea, whose calm waves made a soothing rhythm for the ears. The serenity, however, isn't reflective of the lives of the women we just interacted with in a focus group discussion (FGD), the dried fish fisherwomen of Fraserganj, a coastal village in West Bengal, India.

The various interactions in the FGD brought forth the livelihood realities of the women who play an integral part in the drying of the fish being brought in by the men on boats and trawlers. The elderly ladies take on the role of teachers, who train the younger recruits, many of them members of their family, to sort and categorize the fish and knot the fishing nets. They teach the younger generation the fine points of the trade that they have acquired by being in this profession for decades and through intergenerational knowledge.

The older women sitting together share laughs as they tell us how the

younger girls are slow in picking up the skills while their trainees, most of them their daughters in law, seem unamused at the thought. The young women, belonging to a different generation, with different educational backgrounds, do not enjoy their efforts being undermined by their predecessors. Previously, the men and the women of the family were both invested heavily in the fish-drying sector, even in the off season, but in the last decade many of the men have taken jobs as migrant labourers outside the state, owing to less risky and better paying jobs. Still, they participate in fish drying when they are home, although their absence puts added pressure on the women of the families who are now completely under the guidance of their in-laws for months at a time.

Roopali, one of the younger ladies sitting in a corner, explains how she learned this new skill in a few months. Having been born into a non-fishing family, Roopali had to learn everything about this trade from scratch from her mother-in-law and sister-in-law. According to her, her in-laws had the privilege of learning the craft naturally because they were born into it. *“Ami class 12 pass tai barite amar r nonoder bacha k porate hoye, sonsarer kaaj korte hoye, tarpor ei kaaj korte hoye. Enara to esob koreni.”*, she says annoyingly while pointing at her mother-in-law. *“I have to teach my children and my sister in law’s children because I passed class 12 in school, I have to take care of the family and then do this job as well. They never had to do these things.”*

Roopali’s thoughts are echoed among most of the women of the younger generation, who are trying hard to learn the skills. They believe that better state interventions and awareness of welfare policies can help in combating the current challenges of the fish-drying sector, especially after the COVID-19 pandemic and successive cyclones in the region. However, as we finished the interaction and started to part ways, the women across all the ages, came forward to emphasize their attachment to the profession, which they state is synonymous with their regional identity, hoping that their honest confessions would find a place in the state’s development narrative for the region that often ignores local actors in favour of corporate entrants into the fishing business.

9. Tales From the Sea: Rendez-vous With Vishnu Bhaliya, Jafrabad, Gujarat

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It was by sheer chance that we met Vishnu Bhaliya on the landing site of Jafrabad - a major fishing centre on the Saurashtra coast of Gujarat, supervising the unloading of fish from his boat early in the morning. We have just started our field visit for scoping as part of the DFM project. It was a crisp morning of January 2021, the chill still trying to linger on, though the winter had started its retreat. We started talking to him, casually asking about the economics of Bombay Duck fishing and drying that Jafrabad is famous for. As we kept talking, he grew curious about our mission. Then he said suddenly that people sought him out generally to discuss his writings. *“What do you write?”* we asked. *“Oh, I write stories...”*, Vishnubhai told us nonchalantly. We were so excited to meet a writer in the most unlikely of places.

Vishnubhai has written and published several stories – all about the ocean and the life around it. The titles of many of his works reveal his passion for the seas: ‘The Illiterate Sailor’, ‘Sea is not your Enemy’, and ‘Dreams Rising in the Sea’. He has received many awards for his literary contributions. He particularly cherishes the one he won in in 2019 for his story ‘Salty Tears’, after competing with 293 story writers!

About the life of fishers in Jafrabad he says, *“If I have to describe our life in a single word, I would say struggle (sangharsh). If I have to use more words, then they would be ‘hard work... hard work... hard work.’”*

He also says that the sons of Kharwas, the dominant community of sailors and fishers on the western Indian coast, cannot live without the sea. *“The sea beckons them; and they run towards it. The ordinary man on one side and the mighty sea on the other. They spend the entire lives hanging on to the salty waves”.*

Born in 1984, Vishnu Bhaliya completed his bachelor’s degree in 2007. He joined his father’s fish business and started assisting his elder brother who was in charge of the overall management. They have inboard motorised boats, one made of fibreglass (FRP) (16 metres overall length) and of wood (14 metres long). Right from his childhood, reading was his hobby and he developed a close friendship with books as he was growing up. *“As a student I read a lot of children’s literature from the village library. It has played a vital role in making me a successful writer. It has been a source of inspiration. Even today if I have a leisurely moment, I will grab a book,”* he says.

About his writings Vishnubhai says, *“The sea has been at the center of most of my writings...because very little has been written on it. And I have come from this environment, I am formed in this. I live between a fleet of boats and a pile of fish, so I put the same things into words. Writing is my hobby and it gives me self-satisfaction.”* Incidentally, he also paints.

Vishnubhai’s family processes about 400-500 tonnes of fresh Bumla (Bombay duck, *Harpadon nehereus*) per month on an average to produce 140-150 tonnes of dried fish. Regarding the fish business he says, *“Jafrabad is basically a Bumla fishing harbour. This one fish feeds the whole harbour. We get other fish too, only for a certain period of time. While we harvest largest quantities of Bumla at the beginning of the season after the monsoon, the income from the fish keeps decreasing through the season.”*

He goes on explaining that the process of preparing dried Bumla for the market is long, tedious and costly. The fish has to be thoroughly cleaned, sorted well, and finally dried in the open air. Water must be arranged for washing the fish. Rent for the drying yard is the other item of cost. According to him, Bumla drying is an activity that demands attention day and night.

While boats keep going to the sea for fishing, women take care of the entire drying process – washing the fish, arranging them one by one on ropes fitted to scaffoldings, keeping a watch on the drying, removing the dried fish from the scaffolding, and packing carefully. If Bumla is not dried in time, it will spoil. Even after putting in such hard labour, sometimes it does not fetch a high enough price in the market. *“Our biggest problem here is untimely rainfall. After the harvest is brought to the shore, doing hard labour and paying wages to the labourers, when the rain falls on the dried up Bumla, it destroys everything! All the hard work done come to nought in an instant! You have to pay the workers wages for throwing away the spoilt fish! The fisher who tries to barely stand, breaks down. What else can happen? He has no return, no financial relief. During every season how many harvests gets spoilt like this!”*

On the 17th of May 2021 Jafrabad, along with a couple of harbours nearby, were violently assaulted by the unusually fierce cyclone Taukte. *“I am short of words to describe the catastrophe caused by Taukte”, Vishnu says. “Since 1982 we have been warned several times of storms and cyclones making us feel insecure and scared. But every time the sea has digested its anger. No storm has ever touched the shores of Jafrabad. But on the night of the 17th everything was ruined. On that stormy night, everyone’s life was hanging in the balance. Everyone was overcome by the uncanny fear that none will survive now. Our boats, the only means of our livelihood, were just like toys in the hands of the cyclone! Many people’s livelihoods were taken away, many people’s lifetime earnings were decimated...blown away...swallowed by the angry sea.”*

Unofficial estimates indicated huge financial losses to a large number of fisher households on Jafrabad due to damage and destruction of boats (costing USD 35,000 to 55,000), nets (USD 1,400 per net on average), and dried and fresh fish stock (USD 4,000 - 5,500 per household) apart from damage and destruction of houses. Moreover, thousands of women who sustain the fisheries economy through their hard work in processing lost their livelihoods. Vishnubhai says philosophically: *“We have been pushed back five-seven years... Our houses are broken, boats are broken, but not our courage. We will sail the seas again. We will challenge the same sea. And, the sea of faith will sustain us”*. Words that succinctly portray the indomitable survival spirit of the small fishers in

India.

Excerpt from Vishnu Bhaliya's story 'The Salty Tears'

Translated by Himani Baxi

"Yes, but he is not going to listen to you or me either," told Ramji in a shattered but hardened tone. He just grimaced, was about to speak, but words chose to remain unspoken.

"Whatever you say, ocean is flowing in his veins and that salty water will not let him rest."

The words however did not come out as his wife kept staring at him with desolate eyes.

"I know, you won't stop him. You are the one who encouraged him."

Ramji could feel the resentment in his wife Dhani. He quietly sat beside her and tried to pacify her. "Whatever happens, I will not let him go to this cruel sea." The old lady was reiterating this again and again. Don't know why, but since morning Dhani has been adamant like this. Ramji tried hard to convince her, but she didn't budge a bit. On the contrary she blamed her husband for supporting him. At last, Ramji could no longer hold his sorrow and fear.

He just screamed, "So should I make our young son sit at home and do nothing?" The old man was almost short of breath. He took a pause. He somehow managed to hide his tears and spoke again, "Is there anything else he could do in our village? What will he do? Remember, he is born in a family of fishers."

Ramji walked out of the room, leaving behind a deep moan. While leaving

DRIED FISH MATTERS

he admonished Dhani, "Don't forget, if you are a mother, you are a fisherwoman too."

10. Grandmother's Recipe

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Dried fish has been an integral part of the diet in our family for many generations. The recipes have been carried through generations from our ancestors to the present generation. During my grandmother's time, our families were predominantly rural-based and were living in villages. Later, the family members spread out to different states and countries.

My grandmother's recipes are unique to our region. Dried fish occupied a very special place in the menu most of the time and it was an all-time favourite to all age groups. My grandmother, especially, loved to have it on her plate every day and, if it was missed for some reason, I vividly remember her sulking about it the whole day. The conversation around the dried fish in the family among older women is nostalgic to me. The aroma of the dried fish was always pleasant to my memory, as it is to all my family members. We were never wary nor offended by the strong smell emanating from the kitchen while cooking dried fish. There was no inhibition in using the dried fish in rural life as compared to urban living, because there was homogeneity in the culture and food habits of people in the villages, which is missing in urban areas.

The storage of dried fish in the house was indeed very innovative and needs a mention. The strong aroma of the dried fish is not only enticing to the people, but also to the pets, especially cats. And it attracted pests as well, such

as ants. So protecting and safeguarding the food from the pets and pests has been a real challenge. The kitchen infrastructure was very limited in olden days. Traditionally, earthenware made by the local potter was used in the kitchen.

The family would buy dried fish from vendors of the fishing community who tread their path painstakingly to all villages from the sea coast, as the commuting was also limited and not affordable. Ours was one such village, which was close to the coast and we were hence accustomed to dried sea fish. The family would purchase fish in bulk to last for a few months. The fish was cut into small pieces, usually 5-6 cm in length, and stored in earthen pots. This pot with the lid was placed in a jute holder and hung on the roof. This arrangement ensured that the dried fish was not accessible to pets and pests. The fish was maintained in a dried state without exposure to moisture. The freshness of the fish was retained; the fish wouldn't get stale easily and the fish smell wouldn't emanate. This was an amazing arrangement, a tradition maintained in every household in the region, as there were no refrigerators in those days (before the 1980s). In the present day, we use refrigerators to store dried fish safely, mainly to prevent it getting stale and to preserve freshness.

The dried fish was used extensively in cooking. Several varieties of dried fish such as anchovy, ribbon fish, seer etc. were used in cooking. My grandmother's recipe is very simple and easy to make. It is commonly made with dried seer fish or ribbon fish.

Grandma's recipe

Dried fish fry: This is a basic recipe. It has a good shelf life and keeps fresh for days without spoilage at room temperature.

Ingredients

- Dried fish - 3-4 pieces or as required
- Cooking Oil (groundnut oil) - 10 ml
- Salt - for taste

10. GRANDMOTHER'S RECIPE

- Turmeric - a pinch
- Red Chilli powder- $\frac{1}{4}$ teaspoon or 1-2 grams

Equipment

- Stove
- Frying pan - shallow or flat
- Frying ladle - suitable for the pan

Procedure or preparation

- The dried fish is soaked in water for about half an hour.
- It is then cleaned to remove excess salt, scales, if any, sand or any other impurities.
- These two steps are common for any dried fish recipe.
- Place the frying pan on the stove.
- After it is slightly heated up, add oil.
- Wait for the oil to warm up.
- Now add the cleaned dried fish to the pan, sprinkle turmeric, and allow it to fry on slow flame.
- Keep turning from side to side to ensure uniform frying.
- When it's half fried, add red chilli powder and salt.
- Continue to fry as before, until the fish turns completely brown and crispy.
- Frying to this extent ensures that any moisture in the fish is totally eliminated and the fish is thoroughly cooked to avoid the risk of infections.
- Avoid charring. If left longer, it is likely to get charred.
- The flame is turned off at this point.
- Allow the fish to cool and transfer to the serving bowl.
- Close with a lid. Dried fish fry dish is ready to be served (Figure 1).



Figure 1. Left: Frying dried fish. Right: Served fried fish served. Credit: Nirupama Rebala, <https://m.youtube.com/@agoodplate>

The crispiness is the most alluring sensation of this recipe. It can be eaten directly, more like a wafer, if one prefers. Mostly, it serves as an accompaniment to other curries such as green leafy vegetables curry, bottle gourd curry, brinjal curry, dal soups etc., which are sour and tangy to taste.

There is another crude method to prepare the same dish by roasting, which is easy to make without any kitchen equipment. It is the simplest and quickest method. The washed and cleaned dried fish is cooked directly in the fire made with firewood, charcoal etc., until the fish gets roasted properly on all sides. The direct contact with fire gives a smoked flavour to the fish along with the crunchiness. It is tastier than the pan fried recipe.

Grandmother's recipe is very nostalgic and evokes many memories. There were varieties of dried fish recipes prepared by our family, in combination with different vegetables such as curry or gravy, fried or soup form. Some of the popular recipes include:

- Dried shrimp powder (Figure 2). This is another signature recipe of our family.

10. GRANDMOTHER'S RECIPE



Figure 2. Dried shrimp powder. Credit: N. Rebala,
<https://m.youtube.com/@agoodplate>

- Ridge gourd dried fish curry
- Brinjal dried fish curry
- Tomato dried fish curry
- Soup with tamarind pulp to which dried fish and vegetables like Colocasia, brinjal, and ladies finger are added.
- Dried fish *kadhi* (soup with buttermilk to which dried fish pieces and vegetables are added)
- Dried prawn curry with ridge gourd, brinjal etc. (Figure 4).

This list of permutations and combinations of dried fish with various foods explains the role of dried fish in our family diets.

DRIED FISH MATTERS

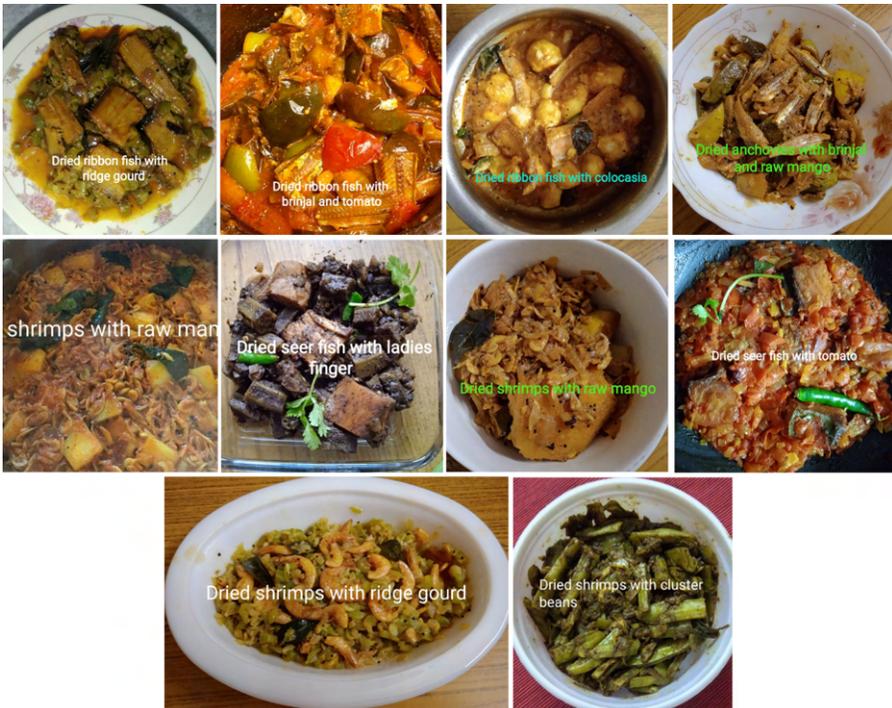


Figure 3. Dried fish dishes. Credit: N. Rebala,
<https://m.youtube.com/@agoodplate>

11. Dawn to Dusk: A Day in the Life of a Dried Fish Vendor

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Women from the fishing community in Visakhapatnam, Andhra Pradesh, India, are the marketeers of the fish, both fresh and dried, who walk through the streets calling out the names of the fish they are ready to sell. Most days, the women step out of the house in the wee hours, procure the material from various sources, and head for selling the same in designated localities. The women deem it a privilege to sell the fish and put in hard work in performing this traditional occupation.

The chapter provides insights and reflections on the socio-economic aspects based on one typical day in the life of a dry fish vendor — a woman who strives from dawn to dusk to fulfill the dried fish needs of the households.

Background

This is a story about the life and livelihood of Yellamma, a dried fish vendor from a fishing community.

Fishing is one of the caste-based traditional occupations in India. The fishing community was traditionally involved in fishing related occupations such as fishing in the deep sea and selling the catch. There are defined gender

roles in the fishing community occupations. While men go fishing out on the sea, women work as fish vendors, selling fish either door-to-door or at the marketplace, with the exception of certain kiosks run recently by men. The fishing community worships the sea as a Goddess called Gangamma in local language and there is a special annual festival called *Gangamma jatara* (fest) in honour of this goddess.

This narrative is based on a day's activity of a dried fish vendor and the social, economic, nutritional, and cultural aspects of her life. Hers is a life typical for scores of other women in the community.

Introducing Yellamma – the dry fish vendor

Yellamma is 50 years old and illiterate. She was born and brought up in the Visakhapatnam coastal belt. She has not gone through any formal education. Nevertheless, she runs her accounts and finances perfectly. She has been in the occupation of selling fish for over 30 years. She is married and blessed with three kids of whom only two survived; one daughter died at a very young age due to illness. She owns a two-room house on the sands close to the sea. Indeed, her house is so close that during high tides, the sea water reaches the house.

Yellamma's family includes her husband and two surviving children. Her husband is illiterate and works as a labourer in fishing boats. He also travels for labour in far-off places like Veraval in Gujarat, along with others in the fishing community of this area. Her two sons are 30 and 27 years old. The elder son has no formal education and is illiterate. He is married with two kids. The younger son studied until tenth class. Both sons are engaged in jobs unrelated to fishing. According to Yellamma, she doesn't get much financial support from either the husband or sons, even though they are employed.

Yellamma's everyday

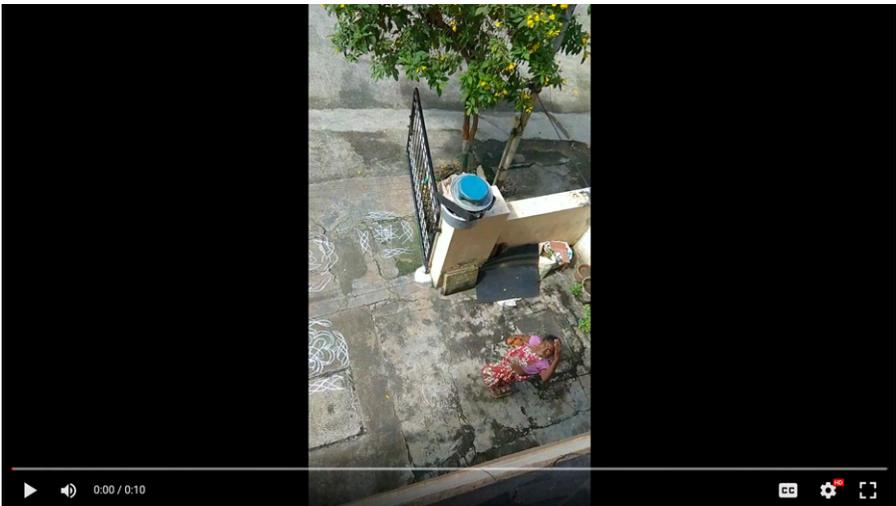
Yellamma's work starts quite early in the morning. She sets out to the fishing harbour at about 5:30 AM with her basket to buy the fish for the day's vending. She sells fish only for three days a week: Sunday, Tuesday, and Wednesday. Her occupation is influenced by the religion, culture, and customs of the region. The remaining days, Monday, Thursday, Friday, and Saturday are observed as sacred days in most parts of Andhra Pradesh, as they are attached to various deities and hence only vegetarianism is followed on these days. Saturday is considered the most auspicious day and the majority strictly abide to the practice of consuming only vegetarian food on this day. Since the residents consume only vegetarian food during these days, the demand for fish is minimal. Consequently, fisherwomen do not sell on these days even though the fish market remains open, with limited supply.

Yellamma acquired experience in selling fish and the business skills from her mother and mother-in-law who were also street fish vendors. She sells fish in an area of about 3 km in radius from her residence. Some women travel as far as 20 km to sell their commodity. She takes an autorickshaw to reach the work area. About ten women sell fish in the same area as Yellamma. Women operating in the same area commute together and disperse in various directions, thus serving the whole area (Figure 1 and the two short videos).

DRIED FISH MATTERS

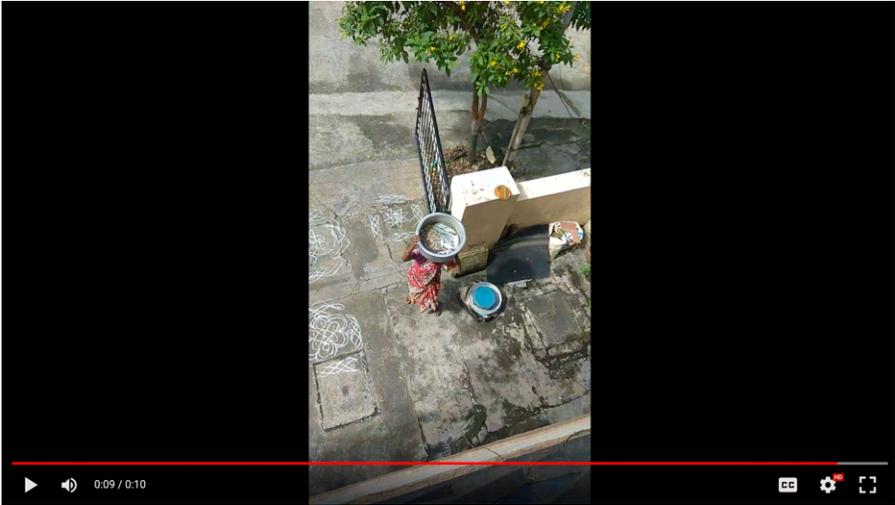


Figure 1. A fish vendor in action. Credit: Sai Leela Modem, 2021



Video 1. Fish vendor in action. Credit: S. L. Modem, 2021. Link: <https://bit.ly/3DjxQcg>

11. DAWN TO DUSK: A DAY IN THE LIFE OF A DRIED FISH VENDOR



Video 2. Fish vendor's activity at one of the households. Credit: S. L. Modem, 2021.

Link: <https://bit.ly/3rpcuaK>

Throughout the day Yellamma and every other fish vendor carry a basket load of fish on the head, which weighs about 5 kg. As they begin vending, they call out loudly to indicate their arrival to the residents. Since she sells regularly in the same area, she is familiar to most households. Her voice gets strained due to loud and continuous shouting in the field, which is likely why the voices of most women in this community have a certain hoarseness. Still, it is not clear if that is due to the strain of shouting or due to genetics.

Yellamma sets out to work without taking any food for herself, as she goes quite early in the morning. She doesn't have time for cooking before setting out. She would buy food and tea on the way and eat during the work. She returns home for lunch later in the day. Not much attention is paid either to food preparation or consumption. The nutritional value of the food she consumes in a day is questionable. Not only her own diet, but the food consumption of other family members' is affected due to her long hours at work. Her mother and mother-in-law were taking care of the children until they grew up.

For fish vendors like Yellamma, every day every day comes with new

challenges and experiences. They have to fend for themselves with respect to food, toilet needs, personal safety etc. They have the major task of selling the goods that are highly perishable, while making profit for the day and bargaining with the consumers. It is not an easy task to go through this ordeal every day and the women who practice and enjoy this profession are highly laudable.

In order to make a living and support the family, the fisherwomen have taken on this occupation, defying the traditional prevailing customs in the Indian society with regards to women. The gender norm dictates that women stay indoors and manage the household with reference to cooking, child rearing etc., while men are the breadwinners for the family. As fisherwomen were equally involved in the family's subsistence, there is a setback in this community in terms of children upbringing and nutritional care. In Yellamma's case, the elder child did not go to school and was brought up without education, even though there were ample facilities in the neighbourhood. Fortunately, Yellamma's children don't seem to have any social behavioural issues, unlike some of the other boys of their generation. It needs to be said that the social well-being of children in the fishing community was in jeopardy as they lacked the parental and adult attentiveness. It was obvious that the upbringing of children was not up to the standard in the fishing community, especially with reference to the male children. Several behavioural and social issues like alcohol abuse, illiteracy, marital problems, single parenting, broken families etc. were rampant in this community. Thus, it could be said that though the fisherwomen earn a livelihood, their family welfare was not satisfactory.

Their livelihood is also occasionally under threat due to a number of reasons. The most unpredictable one was the COVID-19 pandemic, which affected the business due to lockdowns, difficulty in mobility, social distancing etc. Another major challenge to the fishing community, according to Yellamma, is the extensive fishing, which reduces the daily availability of the catch, thus raising the demand and the price. Yet another threat is the migration of non-fishing communities to this occupation. It appears, however, that street vending is still women's domain in the fishing community. Another

area of concern are the changes in the consumption of dried fish, which has, according to Yellamma, reduced in recent times due to the easy and abundant availability of fresh fish. Only about four-five families ask for dried fish, which she supplies on demand.

Business vicissitudes of a dried fish vendor

Yellamma buys the fish once every two days for ₹1,500 ((Rupees: \$1 CAD = c. 60 rupees). She gets about ₹400-500 profit. Presumably, she has a weekly profit of ₹1,200-1,500 that translates to about ₹5,000-6,000 in a month. She sells both fresh and dried fish. Actually, it was observed that nobody sells dried fish exclusively, as selling only dried fish is not lucrative, due to low demand. When both fresh and dried fish are sold, her profit is high. Yellamma sells all fresh fish for ₹200/kg, while dried prawns and anchovies are sold for ₹400/kg. The price of Seer fish, locally called Vanjaram, is ₹500 per pair, with a profit of ₹100. Big anchovies were sold for ₹ 800/kg, while small ones were sold for ₹400-500/kg. Poor quality fish that is not properly dried was sold for ₹200/kg. The price also varied according to the size and quality of the fish. On average, Yellamma has a margin of ₹50/kg — this is the remuneration she gets for her hard day's work. She incurs expenditure for transportation, breakfast, snacks, and beverages which all amount to about ₹150 per day. Some days, the fish is left unsold and is put to dry at the end of the day to avoid spoilage (Figure 2).

DRIED FISH MATTERS



Figure 2. Left: Fish drying process. Middle: Fish drying on the cot and protected with a net. Right: Left over fish put up for drying. Credit: S. L. Modem, 2021

It is very clear that Yellamma's financial status is quite comfortable, as she has assets like a house and gold jewelry. Additionally, her husband and sons are employed. She loans money to others for interest. She and most other women in the city in the lower socioeconomic strata are being supported by the DHAN Foundation, an NGO which provides them with microfinance support. About 15 women in the neighbourhood formed a self-help group called Kalanjiam. Each group has a President, Vice-President, Secretary, and Treasurer. While most of the women of Yellamma's age are illiterate, this is not a deterrent for microfinancing. The foundation assigns one supervisor to about 16 such groups within the same locality or several localities. The supervisor helps the women develop skills such as accounting, bank operations, savings and others to empower them in the financial field. In addition, information on nutrition and health issues are also imparted through experts to create awareness of good health and quality of life. They are also offered loans at low interest to help them bridge financial emergencies. The supervisor meets the group members once a month. Not all members show an interest in attending these meetings. The success and benefits to the

group and individuals depends on the integrity of the group, in the repayment of loans to the bank regularly and other factors. Yellamma gets microfinance support from the self-help group at a low interest rate; in turn, she lends money to others at slightly higher interest rate. This is how she benefits from the NGO's support and this model of microfinance has been successful in supporting women in the city, as they are protected from the clutches of financiers in the region who lend money at exorbitant interest rates and cheat the people. Still, the fishing community turns to such money lenders in emergencies.

It is quite interesting how well Yellamma manages her financial situation, as well as some other women in this community, even though they are not educated and don't have any formal training in these matters. They are independent and autonomous in their financial matters and are very assertive when it comes to managing the households. Yet, they go through a lot of hardships because of the alcohol abuse among men. Yellamma's husband is also a heavy drinker and alcoholism in general is a major setback for the socio-economic development of the families in this region.

All about Yellamma's story

To summarize the life story of Yellamma, it is understood that she leads a pretty comfortable life, socially and economically, as compared to her neighbours and peers. Nevertheless, she goes painstakingly through the daily routine and earns a livelihood for financial independence. She is dedicated to the family tradition of selling fish, going door to door on foot, and calling out to the women to buy her products from dawn to dusk, daring various weather conditions, meeting the demands of the consumers, pleasing the bargainers and, at the end of the day, managing to avoid financial loss. One significant characteristic of the fisherwomen is that they are vociferous and this acts as an armour when they are out on the streets and helps them to carry on the daily tasks with ease. Yellamma enjoys her profession and is happy to serve the people to fulfill their taste for fresh and dried fish.

However, it appears that in a decade's time, this breed of street fish vendors

from the fishing community may vanish. Presently, women of Yellamma's age are leading this occupation and not many from the younger generation are interested in selling fish door to door. Some prefer to work as domestic helpers rather than selling fish. Many young people have changed their career to non-fishing jobs in construction and automobile sectors or they work in small businesses in secretarial or other small jobs, depending on their qualifications and skills. Some are also employed in white collar jobs. In Yellamma's opinion, varied job opportunities are available to younger generations due to education and increased awareness. Other factors include welfare schemes by the government for the oppressed, along with socio-economic development of the region, attitudinal changes of youth, and the paradigm shift regarding traditional occupation. Whatever the future course of this traditional occupation may be, it has provided livelihood and empowerment for generations of women. Yellamma's life is representative of other fisherwomen who sell fish door to door, striving from dawn to dusk, and who have carved a niche for themselves in fish marketing through generations.

12. A Woman in a Strange Place

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“An outsider is always an outsider.” The statement may irritate some people as it sounds xenophobic and can be controversial. Nevertheless, it was what the woman would hear oftentimes, ever since she moved in to live with her husband. Even though they had been married for over a decade, she was still considered an outsider.

A shy woman, who did not respond to any comments or insults from other women, intrigued us and we wanted to learn more about her and her life. The conversation with this woman forever changed my thinking of perceptions and societal dictations on women, which strongly influence women. The experience helped me reflect on myself as a woman who constantly feels lost, as though I don't belong anywhere else.

This essay is a woman's reflection on a woman whose life was culturally predetermined and restrained by her surroundings, including her in-laws. When we first met in the village in 2020, Cho Cho¹⁴ was a 30-year-old mother with two young children, working as a fish processor and retailer. The village is located in Maupin Township, Ayeyarwady Region, Myanmar, which is approximately 54 km from Yangon city. The most important sources of livelihood in the village included rice farming, fishing, rice-fish farming, fish

¹⁴ Pseudonym

processing, and casual labour jobs. We held focus group discussions with women and men as part of research on understanding endogenous meanings of women's empowerment in the rice-fish communities¹⁵. The concept of women's empowerment itself was peculiar for most of Myanmar. The major reason for this is the contested nature of the term; there is no direct linguistic translation in Burmese. While the research was designed to explore the understanding of the rice-fish communities, the definition was not provided ahead of the conversations and discussions.

During the exercise of mapping empowerment to express themselves (the research design has two phases of data collection with multiple research design tools), Cho Cho was labelled as the least empowered woman in the village by the group members even though they were asked not to determine each other's level of empowerment. The incident surprised us. Cho Cho was not different from her peers in terms of jobs, income, and education. She was mostly quiet in the discussion and agreed with how others described her. From my perspective, she seemed irritated and disappointed. The group told us that her husband was an alcoholic and a gambling addict, and could not provide for his family. She was the only one taking care of two young children by working at her sister-in-law's fish processing business. She also worked as a fish vendor in the morning. While she was identified as the least empowered woman by the rest of the group, some had recently lost their source of income, and some had no constant income. Some women mentioned that they could not make decisions by themselves and had to listen to their elders for their life decisions.

We decided to talk with her after the group discussion. We asked her and the other two women for an interview. The other two interviews went well without any distractions. When we set up an interview with Cho Cho, a group of men and women did not give us space to talk with her. Thus, we asked her permission to visit after her work. Although she said yes, other

¹⁵ "Methodology and Collaborative Study on Women's Empowerment" conducted by Includovate and WorldFish Myanmar in Ayeyarwady Region, Myanmar, from November 2019 and March 2020.

12. A WOMAN IN A STRANGE PLACE

women and men, including the community leaders, tried to convince us that her house was not fit to host any guests. Our group was comprised of four women, including one Australian and three Myanmar. We were concerned about disturbing their community, and at the same time, the curiosity was overwhelming. We were aware that we might give the others the impression that we favoured her. Therefore, we had to carefully inquire about the real reason for telling us not to visit that particular house.

We were told that Cho Cho was a complete stranger in the community. It was then that we found out she had been living there for more than a decade. We told the group by ensuring that the visit was not about the village but her experience, that there were no strings attached or support. However, the group proceeded to follow us around the village in the hope of preventing us from talking to Cho Cho. As an alternative, they suggested we talk to others and visit other houses, excluding that house. The final reason behind this suggestion from the group was that the house was in bad condition and not strong enough for us to sit inside.

We wandered around the village and visited other places before visiting Cho Cho. We have repeatedly been reminded of the same thing, not to visit the ruined house, especially with 'a lady foreigner'. Later, we decided to sit beside the road near where Cho Cho and the other women were working. It was Cho Cho's sister-in-law's fish processing place. We casually talked with other women, hoping the group would get tired of convincing us not to visit this particular house. We almost changed our plan and were worried that we might cause harm to their social harmony as the villagers were adamant they did not want us to visit Cho Cho.

Eventually, all men left us after we spent more than five hours in the village. I felt we had talked to almost everyone in the village to ensure that the villagers were comfortable that a stranger was picked to speak. It seemed that we could not dispose of the villagers' expectation that there was a possibility of getting support as a result of our field visit. It seemed to me that the group feared we might choose to support Cho Cho instead of other villagers. This may be based on their experience of non-government organizations coming to the village to provide infrastructure and financial support following the 2008

Cyclone Nargis. It was crucial for us to clearly explain to the villagers that there was no connection between those benefits and our field trip.

Finally, we were able to walk to her house after her shift. Fortunately, there were only one or two women around. We were exhausted and hungry, but the curiosity remained. We discovered that Cho Cho's house was no different from other houses in the village, and it was spacious with good ventilation. It was located on the same road as her sister-in-law's house. We also met her children. Some women came to see us randomly, but they had already lost interest in us.

Cho Cho mentioned that she was the one taking care of her family. Her husband worked in another town and occasionally came back to ask for money. The family had debts that she was paying. She told us that she was a stranger living by herself with the children in the village. She said she was trying hard to maintain a good relationship with her wealthy sister-in-law and the rest of the villagers because she recognized this was necessary. The community was relatively small, with approximately 100 households, and it seemed that the social network determined not only livelihood opportunities but also access to loans. Because of Cho Cho's good relationship with her sister-in-law, she has the opportunity to work as a fish processor for her sister-in-law whenever possible. Likewise, the local currency for daily transactions was 'trust,' with an obligation of reciprocity. Instead of using collateral or deposit, 'trust' is more important in business transaction. As part of 'obligation to reciprocate,' once a person sold a fish to someone, they can expect a similar transaction from this person in exchange. For instance, Cho Cho bought fish with credits from the wholesaler without collateral. Again, she sold fish for credit in the village and sold the fish for cash in other villages. She got loans from multiple sources; informal private moneylenders and microfinance institutions. The relationship among them was built with trust and reciprocity. Some money lenders were also her customers, and it is not surprising that she would feel obligated to sell fish with credits to her creditors as an obligatory gesture. Sometimes, the interest rate from the moneylenders got to 40 to 50 percent when she needed to pay the microfinance teams. Although she recognized the high-interest

rates, she felt thankful for the access to emergency loans from these private moneylenders. Without collateral, it was difficult to get a loan in the village. A relationship built on trust and reciprocity was the only collateral that Cho Cho had.

According to her, being a stranger in the village with several jobs constrained her ability to participate in social gatherings. She worked as a fish retailer, firewood seller, and casual labourer. Her days would start at 3 or 4 AM, and she would sell fish until 9 or 10 AM. Occasionally, she would go out in the afternoon to find firewood and sell it at home. The fish processing job was generally in the afternoon and only two or three days per week. She was earning more than average compared to other women from similar communities. She thought that the other women from the village were more empowered than her because they could rely on their husbands' income and did not have to worry about their livelihood. She agreed with the group's decision to place her as the least empowered woman in the village although we mentioned that it was her to decide how empowered she was. However, she believed she was more empowered ten years ago when she was single and living in her town. She also believed that work and livelihood determined her life, and that working hard was the only way to change their lives. Her hopes for her children included getting access to good education, which could help them avoid the same difficulties she endured. She said her children were the major reason she could not leave the village to find new livelihood opportunities. Factors such as her husband being a drunk and gambler, having multiple obligations to follow to maintain her livelihoods, relying on formal and informal loans, inability to mobilize, and being a migrant were contributing to her feeling disempowered. It was overwhelming to hear her say she felt trapped and incapable of making decisions and that she felt required to listen to her in-laws' opinions on what she could and could not do.

After the conversation, we spent some time at her place before returning to the nearby town for the night. That day was unforgettable, even though I already knew that there are cultural and traditional constraints for women in Myanmar. However, I could not understand that a simple perception of the

surroundings could influence and change an intrinsic definition of a woman's self-worth and identity.

Cho Cho's story might be ordinary in a community like hers. However, the idea of being characterized as a stranger in a xenophobic sense and the efforts of her peers, especially women, in influencing her life was very unsettling as it reminded me of my situation. I had moved to the city for work, and although Cho Cho and I had lived in particular places for more than ten years, we were still considered strangers. This experience made me even more curious about how society can dictate and influence women, regardless of their capabilities.

13. Davla and Dried Shrimps

Parag Tandel, visual auto-ethnographer and Mumbai-based artist, India
in collaboration with

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Parag Tandel, a Mumbai-based artist from the *Koli* (fisher-folk) community, is the co-founder of the Tandel Fund of Archives which seeks to document the community's cultural practices, music and the arts through participatory practice embedded in oral traditions. Food is at the heart of this extensive effort. During the strict lockdown from late March to end-May 2020, fresh fish was largely unavailable to the community as all livelihood activities had ceased. So Tandel and his mother opened up their reserve of dried seafood. To preserve and store food, including various fish, is a common custom amongst the Kolis. They believe that dried fish tastes best in the Monsoon season when fishing is restricted, because the seas are stormy and in order to allow for fish stock to replenish (thus, a sustainability reason). Every week the artist (and his mother) share recipes using dried seafood and ingredients found and cooked only in Koli homes. For this publication they share a rare recipe of dried shrimps cooked with Davla, a local shrub growing in salt marshes.

Parag Tandel collected this recipe of *Davla* and shrimps from his mother, Kamal Kashinath Tandel, from the ancient *Chendani Koliwada* (fishing village) port. This recipe is very close to her heart. Davla is a local natural growing vegetable in salt marshes, available year-round and well known in Western coastal communities. The recipe also can be cooked with fresh mud crabs.

Davla and dried shrimps



Davla and Dried Shrimps. Credit: Parag Tandel

Ingredients

- 250g Davla leaves
- 50g Dried Shrimps
- 2 Medium size onions
- 2 *Kokam* / *Garcinia Indica*
- 2-3 Tsp Red Chili powder
- *Koli Masala*
- Salt
- 1/2 Tsp Asafoetida
- 1 Tsp Turmeric powder
- 3-4 Tsp groundnut oil
- 1/2 inch ginger
- 5-6 Green Chilies

13. DAVLA AND DRIED SHRIMPS

- 5-6 Cups of water

Procedure

1. Heat 3-4 cups of water till it gets warm, wash Davla leaves in running water, add Davla leaves to warm water, cover the vessel and let it cook for 10 minutes.
2. Till then chop onions, green chilies & ginger.
3. After 10 minutes drain water from boiled Davla and let it cool.
4. Heat vessel add 3-4 Tbsp of groundnut oil, add chopped onions, green chilies & ginger, cover the vessel and let it cook till onions turn brown.
5. Wash dry shrimp in running water and let it soak for 5 minutes.
6. Add turmeric, red chili powder / Koli Masala, Asafoetida, add pinch of salt (Davla grows on salt marshes so it has natural salt) and stir well, add soaked shrimps, add two cups of water and stir, cover it and let it cook for 5 minutes.
7. After boiled Davla has been cooled squeeze excess salt content drain from it.
8. After 5 minutes add Davla leaves to half cooked shrimps.
9. Cover it and cook it for another 4-5 minutes.
10. Check salt proportion, and it's done, you can serve it with Rice Roti and steamed rice.

14. The Story of Maimul: Locating Marginalization and Discrimination in the Fishing Community of Sylhet, Bangladesh

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Summary

Maimul is a term widely used to denote the north-eastern haor centric families of Bangladesh, who are involved in fishing, fish farming, fish trading, and fish drying. We came across this term during the scoping field visit on dried fish in Sylhet and Sunamganj. The research participants in the dried fish market told us that though the Maimuls are Muslim, they are considered a lower caste in the society; hence, no one generally wants to have a marital relationship with these families. The term Maimul has a derogatory social connotation. Over the past two decades, people's perceptions of the Maimul suffix have been slowly transforming due to a change in economic circumstances of the people involved in dried fish production and trading. This chapter aims to unpack the tensions around the identity of Maimul in Sylhet, as well as to grasp the transformation of the identity which is intertwined with the local politics.

Introduction

In the north-eastern *haor*¹⁶ area of Bangladesh, ‘Maimul’ is a widely used term that denotes the people who are involved in the profession of catching, farming, trading, and drying fish. Although they are usually involved as a family occupation, those who are new to the profession are also identified as Maimul. The Maimuls are not a distinct ethnic group; rather, they are part of Sylheti Bengali Muslim society and share the same customs, culture, and lifestyle. Similarly to Hindus, there is, in theory, no caste system among Muslims. Therefore, why is the Bengali Sylheti-speaking Muslim fishing community termed Maimul? During our scoping visit to the dried fish market, Massimpur Bazar, a dried fish businessman told us, “*Joto takai rojgar kori, loke amader Maimul e bole, opoman kore*” (No matter, how much money I earn, people call us Maimul, denigrate us). Why are they being humiliated for their profession?

In this chapter, we explore these questions. Also, we tried to find out more about their marginality and the reason behind this. Moreover, we explore the value-chain system of their business. We present our findings in five sections. In the first section, we discuss the methodology of our research. The second section is on the historical transformation of the fishing community in the process of Islamization. In the third section, the process of social marginalization by the non-Maimuls is discussed. In the fourth section, we explore their current situation within the value chain system and their transformation of the business from fishing to dried fish. In the last section, we will summarize the discussion and point out the argument that we have made in the chapter.

¹⁶ Haor is a bowl-shaped wetland ecosystem, which is situated in the northeastern (Sylhet and Mymensingh region) parts of Bangladesh. In monsoon, it becomes a widespread turbulent water body by receiving surface runoff water from rivers and canals. A large portion of the area is transformed into agricultural land when it dries up in the post-monsoon period. *Haor*, *baor*, *beel* and *jheel* are four different types of freshwater wetlands in Bangladesh. Those may seem similar in the framework of the definition of a lake but they all have distinct ecosystems and diverse socio-cultural structures of people living in those areas.

1. Methodology

As mentioned earlier, we came across the term ‘Maimul’ during the scoping fieldwork (for the project Dried Fish Matters)¹⁷ on the fishers and trader community in November of 2020. To enquire about Maimul, we decided to conduct an additional qualitative study relating the caste differentiation and social hierarchies. The targeted population of the study was divided into two broad categories: members from the Maimul community and the residents of Sylhet division¹⁸ outside the Maimul community. From the Maimul point of view, we wanted to know more about their experiences of being referred to as Maimul. From the residents of Sylhet, we aimed to understand how they treat the Maimuls. Of the ten in-depth interviews, five were conducted with the members of the Maimul community, including fishers, dried fish wholesalers, and dried fish producers. Five more interviews were conducted with the non- Maimul of Sylhet. The interviewees were business people, service holders, and students of different levels.

We observed that the Maimul identity is a sensitive topic to talk about. Consequently, many participants from the Maimul community were offended when we wanted to talk to them about their identity and its functionality. Such interactions helped us to understand the complexities of Maimuls identity and the social stigma attached to them. The interactions which

¹⁷ Dried Fish Matters is a research project for mapping the social economy of dried fish in South and Southeast Asia for enhanced wellbeing and nutrition. The research has also highlighted urgent threats like ecological changes, industrial competition, and problems such as contamination and labour exploitation. The project forms a network of interdisciplinary research teams in six countries to address these major oversights. In Bangladesh, it has been conducted by Department of Anthropology, Jahangirnagar University, and Bangladesh Agricultural University. The responsibilities of these two authors of the Department of Anthropology, Jahangirnagar University, were to conduct scoping field visits and research on the inland water dried fish production in greater Sylhet.

¹⁸ Division is the first level administrative divide in Bangladesh. Currently, there are eight divisions, each named after the major cities within its jurisdiction. Sylhet division is at the north-eastern region of the country surrounded by India’s border. There are four districts within this division, which are Sylhet, Sunamganj, Habiganj, and Moulvibazar.

were recorded during the interviews are nothing but the manifestations of social oppression over a long period of time.

The entire research process has been done based on ethical practice. The consent and confidentiality of the participants have been given utmost importance while conducting interviews, and in writing. In addition, pseudonyms have been used for ensuring their anonymity.

2. Islamization and the fishing community

Islamization in the Sylhet has had important links with the origins of the Maimul community. The arrival of the famous Sufi saint Shah Jalal Muzarrade-e-Yamini (1303 AD) and the conquest of Sylhet by the Muslims brought a great change in the socio-cultural life of the local people. Since Shahjalal and his 360 followers (*awlias*) started preaching Islam in the region of Sylhet, lower-caste Hindus like Kaiberta, Patini, Namasudra, and others were attracted in large numbers to Islam's message of social equality and global brotherhood (Wise 1883; 1894). Among the lower caste (Wise 1883), Hindus who were involved in the fishing profession (i.e., Kaiberta, Patini, Jalo, Jaldas) had become known as Maimul after their religious conversion (Smith 1946). Etymologically, the word Maimul is a combination of two Persian words, *Mahi* and *Malla*, where *Mahi* means fish or associated with fish and *Malla* means the boatmen. In the vernacular approach of the general people's language, this *Mahi-Malla* has been changed to Maimul/Maimal (Allen 1905).

From this perspective, the rural production-based society of Sylhet and Sunamganj is broadly divided into *Halwa* and *Jalwa*. *Halwa* means people who carry *haal* or plough and are engaged in agricultural production. The word *Jalwa* denotes people who work with *Jaal* (fishing net), who cultivate and catch fish from artificial or natural sources and involved in fish trading and drying (Singha & Singh 2022). The *Jalwas* are known broadly as Maimul in many cases. As mentioned previously, this *Jalwa* community is neither a scheduled caste nor Hindu but is a community whose members are Muslim. Apart from this binary, there is another identity, known as *Abadi*. The *Abadi* are those who migrated from the nearby district Mymensingh and Kishoreganj

as agricultural labourers and settled permanently in Sylhet division. Though settlers are considered socially inferior because they are not originally from Sylhet, there is no stigma around agricultural cultivators. However, those who are permanent residents of the Sylhet and are involved in agricultural production are deemed to be on a higher social position based on their lineage status or '*khandan*'. However, due to the existing stigma linked to fishing as a profession and the former religious differentiation, the Maimuls are considered inferior even though they are permanent residents.

Muslim society of Sylhet is not different from the Muslims of other parts of the Indian subcontinent. Muslims of Sylhet are characterized by two broad social classes; *Ashraf* and *Ajlaf*. This social stratification is reflected by the activity of descent, occupation, endogamy, and social commensality. Here the elite and land-owning class (*Ashraf*) claims itself to be of foreign descent and remain at the top of the socio-economic hierarchy. *Ashraf* includes family titles like *Sheikh*, *Syed*, *Talukder*, *Pathan*, *Bhuiyan*, and many others who are originally converted from upper caste Hindus to the upper-class Muslims. *Ajlaf* refers to the *Maimul* (Muslim fishers), *Kiran* (Tenant farmer), *Patikar* (Mat makers), *Hajjam* (Barber), *Gulam* (Servants), including other professional castes and lower-caste Hindus who have been converted to Islam (Ahmed 2018; 2020). Many Maimuls use the title *Sheikh* because it was the family title of Hazrat Shahjalal. However, there is a wide social gap between landowner *Sheikh* and *Maimul Sheikh*. In the context of Sylhet, the third social class is called *Atrap*. It consists of the lowest strata, such as the *Bediya* (a nomadic group), with whom no other Muslims would associate, and who are forbidden to enter the Mosque or to use public burial spaces (Crooke 1991). These classes become visible when setting up a marriage relationship. Usually, the *Ashraf* does not want to have a marital relationship with any one from a family of *Ajlaf*. Marriage is practiced between different families among the *Ashrafs*. *Ajlafs* are from different occupational categories, and they have to follow endogamy because none of the *Ashraf* family will agree to have a marital relationship with them, though marriage between *Ashraf* and *Ajlaf* is not forbidden according to the religious scriptures. Likely, the *Maimul* have to maintain the endogamy among themselves.

A businessman from Sylhet, Ratan said, *“In my whole life, I did not see any of the family from our class (non-Maimul) who gets married to a member of Maimul community. Our families do not want to have Maimul relatives because of their occupations and behavior.”* He added that only once did he see a person from a Maimul family get married to a woman from a Bengali family, where the woman’s family was from another part of the country, and they got married while they were studying at the university. Shaily, a medical practitioner said in relation to this particular issue that,

“I have a male relative who got married to a person from member of a Maimul family which was not settled by the families but happened by the bride and groom’s “love affair”. They recently celebrated three decades of married life and yet when he attends any family function, he is ridiculed because of the fact that he chose his partner from a Maimul family.”

3. Marginality of Maimul identity

Maimul identity seems to be similar to the Hindu caste system, however, Maimuls are Muslim, and overall, there is an understanding that Muslims do not have a caste system. The three important elements of the caste system are repulsion, hierarchy, and hereditary specialization (Chaudhry 2013). Unlike the common understandings about Muslims, these elements of caste system are evident in the everyday life of the Maimul people. They are socially repulsed by non-Maimuls in terms of having a marital relationship. Furthermore, in the villages, there exist a segregated spheres of lives, which means there is a fixed place for the Maimul’s residences which others avoid to go.

In educational institutions, students from the Maimul family are subjected to specialized sardonic words or they experience ignominious behavior from their classmates or even their teachers. A university student, Roy, from Sunamganj with a non-Maimul background, said that it is usual for a Maimul student to hear derogatory treatment from their classmates and teachers. Roy observed in schools that teachers classify students in the classroom according to their father’s profession. When a teacher heard that a student comes from

the Maimul family he insults them by saying, “*Oh! Your father is a fisher? So you also will be a fisher or fish trader. Why do you come to school for studying?*” Such behavior impacts student’s motivation for learning. When some of them try to resist such behavior, again they are being blamed for not behaving well, “*we blame them by saying that it is difficult to maintain social relationships with them*”, Roy said.

The socially unequal relationship between the non-Maimul Sylhetti and Maimul is caste-like in function. According to M.N Srinivas’s (1962) definition of caste, Maimuls are Muslim; still, they are like a caste as they are forced to be an endogamous group and they are localized. Their identity is traditionally associated with a fishing-associated occupation, so a lower position is fixed for them within the local hierarchy. The notion of purity and pollution is embedded in the social hierarchy as their houses are segregated in the village and non-Maimuls avoid them. When they are highly educated, anyone from the Maimul community can shift to a different profession. But usually, the non-Maimuls do not like to change their attitude towards that person.

Akhlaq Uddin, a dried fish trader, said that people from Maimul families have very little opportunity to get involved in different professions in the Sylhet area. Other Sylheties are not interested in accepting Maimuls as their colleagues, just as they are not interested in any marital relationship with the Maimul families. Hasan, a non-Maimul Sylhetti said that, even if a Maimul reaches a higher economic level, he would still be considered a person from the lower class. He added that a wealthy Maimul is even more despised for earning *Kancha Taka*, which connotes newly earned wealth in Bangladeshi society. *Kancha Taka* is seen as inferior to income inherited from the landed production. Those who have earned *Kancha Taka* are newly rich (*nobyo dhoni*) and they are not considered aristocrats. In Bangladeshi society, ascribed socio-economic status is more valued than the achieved economic ability.

If someone from the Maimul community wants to establish themselves in politics, it is often observed that they are hiding their community identity. Karim, a student from a college of Sylhet who also participates in student politics noted that once, one of the political leaders who was originally from

a Maimul background and was studying at a university in Dhaka, had come to Sylhet after getting a higher position at the party's central level committee. While talking to us, he kept saying, "*Do not misunderstand, I am not a Maimul*". Karim added that a person would say this if he was interested in being involved in local politics. This shows the identity for which the political leader was being admired by others in Sylhet was the identity that he had acquired after his passage from Sylhet to Dhaka. And his original community identity was not a factor in getting the political position in a student political party. However, when he wants to be active in local politics in Sylhet, it might have become necessary to hide his original community identity. Although he was admired for being a central leader, he thought that the Maimul identity could be a big obstacle for him to become active in the regional power structure.

Likewise, a few days earlier the local union council elections were held in the Sylhet where candidates participated with the support and symbols of their respective parties. In one such election in Habiganj¹⁹, a Maimul candidate contested the election with the support of the ruling party and lost with a huge difference among the contestants. The tireless election campaign of the party campaigners failed to gain him public support. Kabir, a businessman, and a local voter, said, "*Ordinary voters were not interested in electing a Maimul as their representative, no matter how much support he got from the ruling party.*" He added, there is a proverb that expresses the local common people understanding that "*maimul der chokhe rokto nai*" (There is no blood in the eyes of the Maimuls). They do not mean that Maimuls do not have blood in their eyes; however, metaphorically it means, Maimul's behavior is unpredictable and not trustworthy. Socially, eyes are not only to see, but also to communicate affection, shame, truthfulness etc. For instance, it is common to say after a wrongdoing, s/he cannot defend her/him while maintaining eye contact, they keep their eyelids down. Kabir said, "*If one Maimul faces a problem, the whole community comes to their side and counter the opposition.*" This expresses that the loyalty which a non-Maimul expects from a Maimul does not exist in the cases of conflicts. Hence, a member of the

¹⁹ An administrative district in Sylhet division,

Maimul community is not seen to be a trustworthy political leader. There is an assumption that s/he will only serve the Maimuls. The eyes of the Maimul do not consist of actual blood, which means they lack shame and trustfulness and if they do wrong, they will always have their community support. Kabir's discussion signifies the Maimuls' (Siran 1989) otherness through the lens of the majority of non-Maimuls who consider the Maimuls socially inferior, and their hostility towards Maimul is evident.

Though Maimuls' experiences resemble that of the communities of the caste system, we cannot label them as a caste because in the caste system, communities are divided into inherited professional groups. Usually, the children of Maimul community members follow their forefather's professions. Their name of the community is not Maimul; however, the non-Maimuls call them as Maimul. Furthermore, as we mentioned earlier all people who are involved in fishing related tasks, such as fishers, business people of fish, dried fish business people are also considered as Maimul. Therefore, newly involved dried fish business people are also termed as Maimul by the non-Maimuls.

4. From fresh fish to dried fish business

The timeline of involvement of the Maimul community in the production and trading of dried fish is not very old. Sylhet's oldest wholesale dried fish market is situated in Massimpur²⁰. This was established during the liberation of Bangladesh and the initiative was taken by the Maimul community of two villages (Hossain et al. 2022). For the last two decades (personal

²⁰ Dried fish have been sold in Massimpur market for the last fifty years, and fish is brought here from different parts of Sylhet and Sunamganj. The middlemen (*Bapari*/middleperson) bring dried fish to Massimpur from places like Chittagong, Cox's Bazar, Syedpur, Faridpur, and greater Sylhet-Mymensingh areas. Most of the freshwater dried fish come from greater Sylhet haor basin, different parts of Mymensingh (KularChar and Mohangonj), Faridpur, Lalpur of Brahamanbaria, and the marine dried products come from Chittagong, Cox's Bazaar and Barisal-Patuakhali area. Along with trading of dried fish dominated by marine fish, fermented fish is also prepared and traded here. The sold dried fish is sent to different parts of the country and abroad.

communication during a scoping field visit), since the beginning of the new wave of dried fish production, both the people of the Maimul community and those from outside have joined the business. According to records, dried fish business people have been involved in the business for four generations. However, they were not involved in fishing. Meanwhile, the growing demand for specialized fermented fish (*Chepa* and *Shidol*) in Sylhet has also played a significant role in the growth of their business. While the Muslims of Sylhet were not accustomed to eating dried fish, recently they have started to include it in their diet. Marian W. Smith (1946) reported in his paper “*Some of the fish is dried, but Moslems do not think it proper food because of their general religious practice of abstaining from all but freshly killed meat.*” Urbanization here plays an important role in dried fish consumption. Due to the inadequacy of protein collected from natural sources, rising commodity prices, and the decline of overall purchasing ability, dried fish has become an affordable, low-budget protein for the urban economic lower-middle class and lower-class people.

In addition to the increase in commercial poultry and fish feed production, there has been a special demand for dried fish, which has become a reliable source of supply for dried fish wholesalers. Majnu Mia, a wholesaler and a member of the Maimul community said:

“When I started the business a decade ago, I could neither buy a large quantity of fresh fish at a time and nor could keep it in the warehouse. If I failed to sell them on time, always there is then a risk for the product to turn rotten. But now I can send the unsold products to the feed factories and can recover the capital with a small amount of profit. This procedure helps me to buy a large amount of fish from the fishers during the drying season and can save more money to invest for next drying season.”

But in most cases, the dried fish producer Maimuls from the Maimul community do not have sufficient capital to set up the *Dangaries* (a platform for drying fresh fish) in every drying season and cannot get loans from any government source. Although some NGOs are interested in giving loans, most of the producers are not interested in taking loans from them due to high-interest rates and strict time-limit for paying installments. Instead, they depend on the local fisher associations or *Dadan* (unofficial money

lending system with high-interest rates) merchants for the capital of the business. The warehouse owners also lend money to the fishers for a six percent commission/interest on strict conditions, including that the fresh fish should be sent to the warehouse of that particular wholesaler.

On the other hand, the demand for dried fish has grown significantly among the Bengali diaspora community living in the United Kingdom. It also becomes easy to send the products anywhere in the world through couriers. Presently, the sellers in the main wholesale markets of Sylhet have started sending a great amount of dried fish to the Bengali community and supermarkets abroad every month.

Dried fish production has opened up new avenues for the Maimul community to earn cash regularly during the drying seasons. In the past, they had to rely only on fresh fish catching, selling, or farming. However, now they have new sources of income through fish processing, drying, and trading on a large scale. When a Maimul family is launching a *Dangari* in the drying season that means they can arrange employment for at least several more Maimul members. During our scoping field visit, we have seen that the number of *Dangaries* in the Sylhet division has increased a lot in the last decade. As a result, when a group of Maimuls are raising capital for the dried fish business, they are simultaneously securing their economic position. They would not have been able to achieve this if they had bound themselves to the traditional characteristics of their profession in Sylhet. In the cities, the Maimuls involved in the dried fish or other fish businesses, have consolidated their position through economic contributions to various religious and social institutions (such as mosques, clubs, *dargahs*, political organizations). These contributions have given them the social recognition and, in some cases, higher statuses. As a result, Maimuls get the scope to temporarily suspend their identity. However, this only happens in the case of those Maimuls who can contribute to the social and religious organizations. Furthermore, as they are small in number, they cannot make significant changes to society's opinion of the Maimul identity.

5. Conclusion

In this chapter, we have tried to illustrate the existence of social and cultural marginality of the Maimul identity by revealing the vulnerability that is created by non-Maimuls. In the past during Islamization, many lower caste Hindus were converted to Islam. However, after the conversion, their social status was unchanged and they continue to be considered Ajlaf, those belonging to the lower Muslim strata. The general perception is that social stratification does not exist among Muslims. However, historically in Bengal, social stratifications are evident in every aspect of peoples' lives. As Maimuls are not necessarily members of this community by birth, they are not completely analogous to a Hindu caste. Also, their social status is not fixed. Maimuls are often labelled by non-Maimuls as untrustworthy, without leadership qualities, etc. Among non-Maimul communities, it is believed that Maimuls are polluted, which Arefin (1982) suggested in his study on Muslim stratification. This is how their marginality has been continuously created and recreated.

Although the socio-political marginal identities of Maimuls dominate their economic status, this community has been transcending their marginality through the new economic expansion resulting from participating in the dried fish business. This has given them new opportunities for social mobility. In semi-urban and urban areas social and political participation has been increased through education and improved economic capacities, although marginality is still pertinent. There is also a significant number of Maimuls who, like other Sylheties, have been working in the UK as immigrants. This has been contributing to their economic capacity as well as to their economic contribution to society. Besides, educated and repatriated Maimuls are changing the pattern of the dried fish business. An online dried fish export business has been started. They are fulfilling the demand of both the diaspora community abroad as well as the other districts inside the country. This has been helping to expand their business and add more value to the well-being of some Maimuls.

References

Ahmed, Ohi Uddin. 2018. 'Landed Aristocracy Emergence of Social Stratification among Muslims in Chachar (1830-1947):' *International journal of Advance Research* 6, (October 2018): 332-337.

Ahmed, Ohi Uddin. 2020. 'Talukdars and Tapadars: Landed Aristocracy and Social Stratification among the Muslims of Karimganj in Southern Assam.' *Journal of Critical Reviews* 7, no. 6 (2020): 2774-79. <https://www.jcreview.com/?mno=59368>.

Allen, B.C. 1905. 'Assam District Gazetteers.' *Calcutta: Calendonian Steam Printing Press* 2.

Arefin, H.K. 'The Stream of Muslim Stratification in Bangladesh.' *Samaj Nirikshan* 14, (1982): 34-67.

Chaudhry, Prashant. 2013. 'Caste as an Institutionalised System of Social Exclusion and Discrimination: Some Evidences.' *International Journal of Gender and Women's Studies* 1, no. 1: 56-63.

Crooke, W. *Census Report, Bengal, 1901: The People of India*. New Delhi: Munshiram Manoharlal, 1991.

Hossain, Mostafa, Mirza Taslima Sultana, Sayeed Ferdous, Md Samsul Alam, Rasheda Akhtar, Md. Siddiqur Rahman, Md. Sumon Shahjahan, and Mahmudul H. "Key Locations: Dry Fish Processing and Trading in Bangladesh." *The University of Manitoba and Bangladesh Agricultural University and Jahangirnagar University* (2022).

Siran, Jean-Louis. 1989. 'Names and Proverbs among the Vute (Cameroon): Signification, Meaning and Value.' *Journal of Folklore Research* 26, no. 3: 207-227.

Nilkamal Singha, and Oinam Ranjit Singh, O.R. 2022. *Early Assam Shaping of the Cultural Landscape*. Chennai: Clever Fox Publishing.

Smith, Marian W. 1946. 'Village Notes from Bengal.' *American Anthropologist* 48: 574-592.

Srinivas, M.N. 'Caste in Modern India and Other Essays.' *International Affairs* 39, no. 3. (1962). <https://doi.org/10.1093/ia/39.3.471a>.

Wise, James. 1883. *Notes on Races, Castes and Trades in Eastern Bengal*. London: Harisons and Sons.

Wise, James. 1894. 'The Muhammadans of Eastern Bengal.' *The Journal of Asiatic Society of Bengal* LXIII, no. 3: 28-61.

III

Describing Dried Fish Value Chains

Introduction: The Diverse Values of Dried Fish Across Value Chains

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This introduction aims to provide an overview to the ‘Describing Dried Fish Value Chains’ section of the book with special attention to the threads that cut across the chapters in this section.

The concept of ‘social economies’ provides broader framing for this section. Social economies are described as internally diverse and largely informal sectors of the economy that are embedded in particular social, cultural contexts and histories. Methodologically, the chapters in this section underpin a range of approaches and methods. Hossain and colleagues, for example, take a narrative approach to explore socially embedded fish fermentation practices in the floodplains of Bangladesh (Ch. 16: Fish Fermentation in the Floodplain) while Pradhan and colleagues review published literature to establish critical conceptual linkages among different areas of scholarship (Ch. 24: From the Neoclassical Economic to the Social-Ecological System Perspective). This methodological blend enriches our academic engagement in moving forward dried fish research as a partnership.

The value chains section is structured into two separate sub-sections: a) describing value chains and b) theorizing value chains. The former includes eight chapters that deepen our empirical understanding of the movement of

dried fish as a commodity while the latter includes four chapters that explore concepts, theories, and ideas that can advance our scholarly understanding. Several important threads emerge across these two sub-sections.

In particular, the chapters grouped into the **Describing Value Chains** sub-section weave together six important threads. First, value chain mapping and attention to structural organization (e.g., nodes, linkages, and segments) offer a flexible approach to selecting a focal point(s) for in-depth study. For example, Rungruengrayup and colleagues focus on the trading segment and the experiences of shopping for dried fish in Thailand (Ch. 19: Shopping for Dried Fish). Galappaththi and colleagues, on the other hand, explore the processing nodes of coastal and inland value chains in Sri Lanka (Ch. 17: Coastal and Inland Dried Fish Value Chains in Sri Lanka).

Second, the chapters shed light on the diversity of ecosystems that sustain dried fish value chains such as coastal and marine ecosystems, lakes, reservoirs, rivers, and floodplains. These ecosystems not only add to the complexity through different fish varieties, products, processing methods, and associated livelihoods but also make the study of dried fish an intriguing endeavor.

Third, the study of dried fish across geographies can be undertaken at different scales and with attention to various phenomena. In the case of India, for example, Srinivasan undertakes a macro-scale analysis of country's dried fish trade (Ch. 22: India's Fish and Dried Fish Trade) while Salagrama and Dasu focus on micro-scale dried fish trading practices in northern Andhra Pradesh state (Ch. 20: Living on the Edge). The insights that emerge at these different scales therefore converge in ways that advance a contextually rich understanding of how dried fish social economies work.

Fourth, gender dimensions emerge as a defining characteristic of dried fish value chains. For example, gender division of labour, norms, practices, working conditions, and other issues associated with value chain work come to light through several empirical investigations in this sub-section and across study contexts.

Fifth, the dynamic nature of dried fish value chains is also evident across the chapters. These changes include responses to the COVID-19 global pandemic

like the study by Almine and Chuenpagdee on online marketing of premium dried fish products in Thailand (Ch. 23: Online Marketing and E-commerce of Dried Fish in Thailand) and Srinivasan's study on structural shifts in India's dried fish trade over time (Ch. 22).

Lastly, the chapters provide evidence of value chain adaptations in face of change. These adaptations include both positive and negative responses and raise questions about the long-term sustainability of dried fish value chains. For instance, Almine and Chuenpagdee highlight the expansion into online marketing in Thailand (Ch. 23) while Salagrama and Dasu explore challenges to intergenerational transfer of dried fish operations due to increasing trends of younger women in fishing families seeking alternative employment opportunities (Ch. 20).

Overall, the first sub-section is an empirically grounded reflection on different ways of representing value chains. Then, how can we unpack these empirical realities by drawing from various concepts, theories, and frameworks offered through existing bodies of scholarship? Are those adequate to advance a comprehensive understanding of dried fish or do we need to broaden their scope? If so, how? These questions are explored in the chapters grouped into the second sub-section: **Theorizing Value Chains**.

Several threads also run across the chapters in this second sub-section. First, the chapters critique the conventional economic-oriented approaches to understanding the process of value creation within value chains. They then explore ways to broaden the scope of value, both conceptually and analytically. In doing so, the authors pursue different points of departure. For example, Pradhan and colleagues take a social-ecological systems approach to reimagine value chains (Ch. 24) while Rahman brings a socio-cultural perspective (Ch. 25: Examining Value from a Socio-cultural Perspective). Other authors also explore new analytical approaches, such as the semantic analysis employed in Thrift's chapter on gastronomic traditions of air-dried fermented fish in Faroe Islands (Ch. 27: Dried Fish as Sustainable Gastronomy). Through such interrogations, the authors offer novel frameworks and thinking to guide future dried fish value chain research in ways that yield

rich understandings.

Second, the authors creatively explore a variety of research questions conceived through various approaches while showcasing the emergent, curiosity-driven nature of dried fish research. Jyotishi and colleagues, for example, question why some parts of the value chain use traditional non-standardized measurements while other parts use the metric system to weigh and measure dried fish (Ch. 26: Navigating Weights and Measurements in the Dried Fish Supply Chain).

Lastly, the chapters in this sub-section also explore applied perspectives of dried fish and relevance to sustainability discourse more broadly. For instance, Thrift highlights direct linkages between culinary traditions and consumption patterns associated with dried fish and the United Nations' Sustainable Development Goals (Ch. 27).

In sum, the first sub-section emphasizes structural complexity, ecosystem diversity, scale, gender dimensions, dynamics, and various adaptations of dried fish value chains in the face of change. The second sub-section provides guidance for future scholarship through novel conceptualizations, applied perspectives, and creative explorations. While weaving these threads, the two sub-sections together illuminate different 'fragments' of dried fish value chains and begin to move towards a more holistic understanding of dried fish, the goal envisioned by the Dried Fish Matters Partnership at the outset.

15. Maldive Fish Processing in Southern Sri Lanka

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Abstract

Maldive fish is a special form of dried fish utilized as a flavour-enhancing condiment in Sri Lankan curries and *sambals*. However, the processing technique differs from normal salted and sun-dried fish in that it includes boiling, smoking, and drying. Maldive fish processing is popular on the south coast of Sri Lanka, especially as a cottage level industry. Yet it is consumed as a product in the entire island. Using gendered value chain and social wellbeing approaches, this chapter analyses the Maldive fish processing techniques, gender relations, and wellbeing of processors, based on qualitative data collected through thirty in-depth interviews. Field work was conducted in four main processing sites, Kudawella and Gandara in Hambantota district, and Kottegoda and Dondra in Matara district in southern Sri Lanka. Changes in processing methods used in the past and present, the extent of women's and men's engagement, trading, value addition, and scale of operations are discussed, with special focus on how these practices contribute to the wellbeing of processors. Opportunities for increasing production, quality

and value-addition, as well as constraints relating to technology, credit, and health hazards need to be addressed to increase the economic returns and wellbeing of producers.

Introduction: Socio-economic context of Maldive fish processing

Sri Lanka possesses a considerably long history of Maldive fish processing. What is commonly known as Maldive fish (*umbalakada* in Sinhalese, *maasi* in Tamil), is a specially processed form of several tuna varieties, used to flavour a variety of curries and other food, serving as a vital source of protein for the people in both Sri Lanka and Maldive Islands. Originally produced in the Maldives, this processed fish began to be produced more intensively in Sri Lanka most likely from the 1970s, when an import substitution policy was instituted for a large number of food items. Because fish is susceptible to spoilage, processing is generally required to prevent post-harvest losses (Cutting 1996). The main forms of value additions in fisheries in Sri Lanka are salting and sun drying, or processing 'Maldive fish', which includes boiling and smoking, in addition to sun drying. Fishing communities engaged in Maldive fish production in coastal areas use their excess tuna catches or purchase raw materials from auctions to engage in this process. The current producers refer to a tradition and knowledge of processing Maldive fish and dried fish handling passed on through previous generations. These processed fish items generate fairly good income for the family and are also utilized for family consumption. The engagement and the involvement of men and women in Maldive fish production provides employment opportunities, especially for people in coastal areas. The purpose of this chapter is to present an overview of Maldive fish production and trade, including the relations of production and trading, social wellbeing, opportunities, and constraints in the main producing areas on the south coast of Sri Lanka.

Methods

Study locations

Kottegoda and Dondra in Matara district and Kudawella and Gandara in Hambantota district were selected as study sites (see Figure 1) in the Southern Province of Sri Lanka. These are all coastal fishing communities, with the majority of households engaged in fisheries-related livelihoods.



Figure 1. Study locations in the Southern Province, Sri Lanka. Source: Authors' rendering

Data collection and analysis methods

Processors were selected from each area using a snowball sampling technique. Thirty processors were interviewed, of whom half were women and half were men, from all four sites. Primary data were gathered from these research participants through semi-structured, in-depth interviews to elicit information on processing methods, fish varieties, gender roles, value addition, wellbeing, constraints, and opportunities. In addition, three focus group discussions with ten research participants, including processors, fishers

and traders, were conducted in Dondra. The majority of focus group participants were women as enterprises in these study sites on the south coast are mainly run by women. Focus group discussions in Kottegoda, Kudawella, and Gandara could not be held as planned due to the COVID-19 pandemic. Atlas.ti software was used to code and analyze transcripts and field observations.

Fish species and processing methods

Fish species

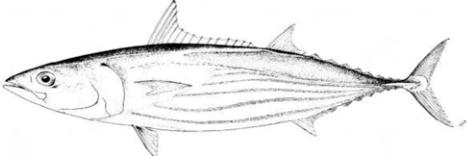
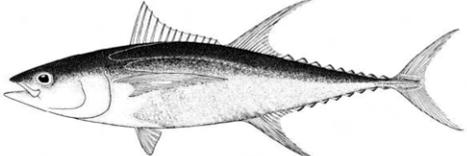
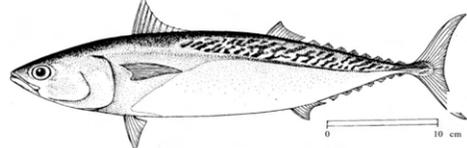
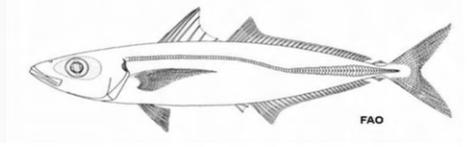
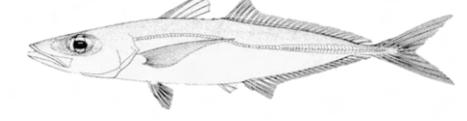
The findings of this study revealed that the processors prepared Maldivian fish using Skipjack tuna (*Katsuwonus pelamis*), Yellowfin tuna (*Thunnus albacares*), and Frigate tuna (*Auxis thazard*) species as the commonly used raw material. Indian scad (*Decapterus Russell*) and Bigeye scad (*Selar crumenophthalmus*) are also used to prepare Maldivian fish (see Table 1). Processors purchase fresh fish from Kudawella, Dondra, Mirissa, and Galle fisheries harbours, which are located in the Southern Province.

Overall, processors mainly depend on Skipjack tuna. The reason for the preference is that processing of Skipjack tuna is the most profitable and easiest compared with other fish varieties. Processing of small varieties is less profitable than processing of large varieties, as more effort and larger spaces were needed to process small fish varieties. Generally, fresh fish of grade 2 or 3²¹ quality are used for processing Maldivian fish. The processing of Frigate tuna, Indian scad, and Bigeye scad is a relatively recent phenomenon, resulting from an increased catch of these species by the expansion of multi-day boats engaged in off-shore fishing since the 1980s.

²¹ There are three different types of fish grades. The first grade of quality fish is used as fresh fish for human consumption, while the remaining two grades are used for processing. Fish that has been bruised or injured is of second grade. Long-term stored fish is included in grade three. Fishermen and processors can identify and grade fish by its appearance, texture, and odour.

15. MALDIVE FISH PROCESSING IN SOUTHERN SRI LANKA

Table 1. Fish species used to prepare Maldive fish. Source: Illustration courtesy FAO Species Catalog: Scombrids of the World

Fish species	Sinhala, English, and Latin names
	<p>Balaya Skipjack tuna <i>Katsuwonus pelamis</i></p>
	<p>Kelawalla Yellowfin tuna <i>Thunnus albacares</i></p>
	<p>Alagoduwa Frigate tuna <i>Auxis thazard</i></p>
	<p>Linna Indian scad <i>Decapterus russelli</i></p>
	<p>Bolla Bigeye scad <i>Selar crumenophthalmus</i></p>

Processing methods

The processing method and techniques have changed from the past due to changes in the scale of operation, profit expectations, space availability, and hygiene concerns. Thus, we can see clear changes between traditional and modern processing techniques.

Traditional method

This traditional method was used by processors until 10 to 15 years ago (Figure 2). First, after de-heading and descaling the fish, the gills, gut, viscera, and internal organs are removed by splitting it in half. Then clean, fresh water is used to wash the fish thoroughly. A colander is filled with water and the fish is drained. The fish is boiled for more than one hour. After boiling, the boiled fish is taken out with a metal spoon and the fish laid on drying racks. The fish is separated into 2-4 parts after cooling. Stacking fish on top of each other is avoided. The fish is dried for two to three days under direct sunlight. After drying, the fish is smeared with ash to prevent insect infestation, then placed in racks for further drying. Dried fish is then weighed, packed, sealed and stored at room temperature.

15. MALDIVE FISH PROCESSING IN SOUTHERN SRI LANKA



Figure 2. Maldivian fish processing steps: Traditional method used in the past.

Source: Koralagama et al. (In review)

In the past, ash was added for the processing of Maldivian fish to prevent infestation of insects and fungal growth. Fish was not cooked in saucepans as it is done now. At the stage of boiling in barrels, fish was usually placed inside gunny bags (made of jute fibre) and put into the barrel. After boiling, the fish was taken out of the bags, mainly used to prevent breakage of the fish. Some people used woven plastic bags during the boiling process. They placed four fish in one bag and put it into the barrel and reused the same bag several times. Therefore, when heat was applied, the bag's chemical components, such as labelling dyes and microplastics mixed with the fish, resulting in

health hazards. Therefore, some processors preferred to use metal crates instead of woven plastic bags while others used gunny bags. Most did not use crates as these were expensive. Some used banana leaves to prevent corrosion of the bottom of the barrel from salt. In the past, Maldivian fish was dried on coconut fronds. Polythene tents were used to cover the drying fish, in order to reduce fly infestations.

I use banana leaves to protect the bottom of the barrel from salt damage. These are natural and not harmful to health. (Female processor, 30 years, Kottegoda)

One processor in Gandara, covers Maldivian fish with blue coloured polythene tents at the drying stage.

While drying, there is gecko and iguana damage to Maldivian fish. Therefore, we have to be careful to prevent damages, otherwise the quality is reduced. We cover Maldivian fish with blue coloured tents, in order to reduce the impact of flies. (Female processor, 44 years, Gandara)

Modern method

The modern method for processing Maldivian fish is summarized in Figure 4 and described in detail as follows. First, following de-heading and descaling, the gills, gut, viscera and internal organs are removed from the fish by splitting it in half. Then clean, fresh water is used to wash the fish thoroughly. A colander is filled with water and the fish is drained. Four fish are placed in each plastic bag and approximately 15 bags are inserted into a barrel or metal crates, which are then placed inside boiling pans. Then salt is added into the barrel or boiling pans. Approximately 5 sacks (around 200 kg) of salt are used for 1,000 kg of fresh fish. Water is added to cover the entire fish volume. The fish is boiled for two hours and left to dry for around one hour. The salted fish is removed from the strainer and smoked for around 8-12 hours. After that the separated parts are arranged or laid on the mesh of a

15. MALDIVE FISH PROCESSING IN SOUTHERN SRI LANKA

wire screen. To make sure that the fish is dried evenly, they are not stacked on top of each other. The smoked fish is dried for six to seven days in the sun or direct sunlight. To prevent contamination while drying, the fish is covered with polythene sheets. The processed Maldive fish is then weighed, packed, sealed, and stored at room temperature.

At present the processors do not use wood ash during the processing due to two main reasons: the restriction laid down by the PHI and other government institutions and the possible health hazards. Currently they use the smoking method to prevent damage by maggots (larval stage of house flies), make the texture hard and reduce water content. The smoking technique also helps to expedite the drying process, especially in the rainy season. They use a 'Dum Massa' or a home-made oven out of concrete and metal for the smoking process.

Some processors use sawdust as a burning material instead of coconut husks. They are of the opinion that wood ash smoke prevents Maldive fish turning black in colour, so that the quality of the final product is high.



Figure 3. Insect attack. Credit: Anupama Adikary, 2020

While boiling the fish, a few processors add gamboge (*Garcinia tinctoria*), tamarind (*Tamarindus indica*), pandan leaves (*Pandanus amaryllifolius*), and curry leaves (*Murraya koenigii*). The purpose of using these ingredients is to

give a better flavour, toughness, and smell.

We put gamboge and salt to the boiling water as it makes Maldive fish tastier. And the Maldive fish gets harder than otherwise. Good Maldive fish can be identified by its smell. If the gamboge and salt are not in good balance the Maldive fish is not strong [“goraka and lunu padamata awe nethinam umbalakada shakthimath ne”]. (Male processor, 75 years, Kottegoda)

These also prevent flies from being attracted to the products as well. Approximately 250 g of gamboge or tamarind are added for 6 kg of salt. There is no exact proportion of pandan leaves and curry leaves, which are instead measured by experienced approximation. However, application of these ingredients is difficult for large scale producers, due to limited availability and additional processing costs. Further, the health hazards caused by contamination must be assessed when using acidic ingredients, such as gamboge and tamarind, in aluminum vessels.

When these ingredients are added, processors incur an extra cost, making it difficult for them to compete with other processors who do not add these ingredients to their products. If they raise their prices to cover the cost, it has a negative impact on their business. Therefore, instead of adding curry leaves and pandan leaves, they use gamboge and tamarind during the seasons in which these fruits are cheapest. Otherwise, the ingredients are not added at all during processing. Cinnamon leaves are also used by some processors.

Some people add cinnamon leaves too. Then the Maldive fish gets a good smell and taste. We prefer to add cinnamon leaves, but these are difficult to find. Then, the fish is drained to remove the water and cool. It is stacked in the ‘dara poranuwa’ [wood oven]. It is smoked for two days. I do this myself. Normally we use the wooden charcoal that remains in the evening from the day of boiling the fish. The next morning, we smoke again using firewood. (Female processor, 45 years, Kottegoda)

15. MALDIVE FISH PROCESSING IN SOUTHERN SRI LANKA

There is an effort to conserve wood, as the charcoal for smoking the fish is from the firewood burned previously for boiling.

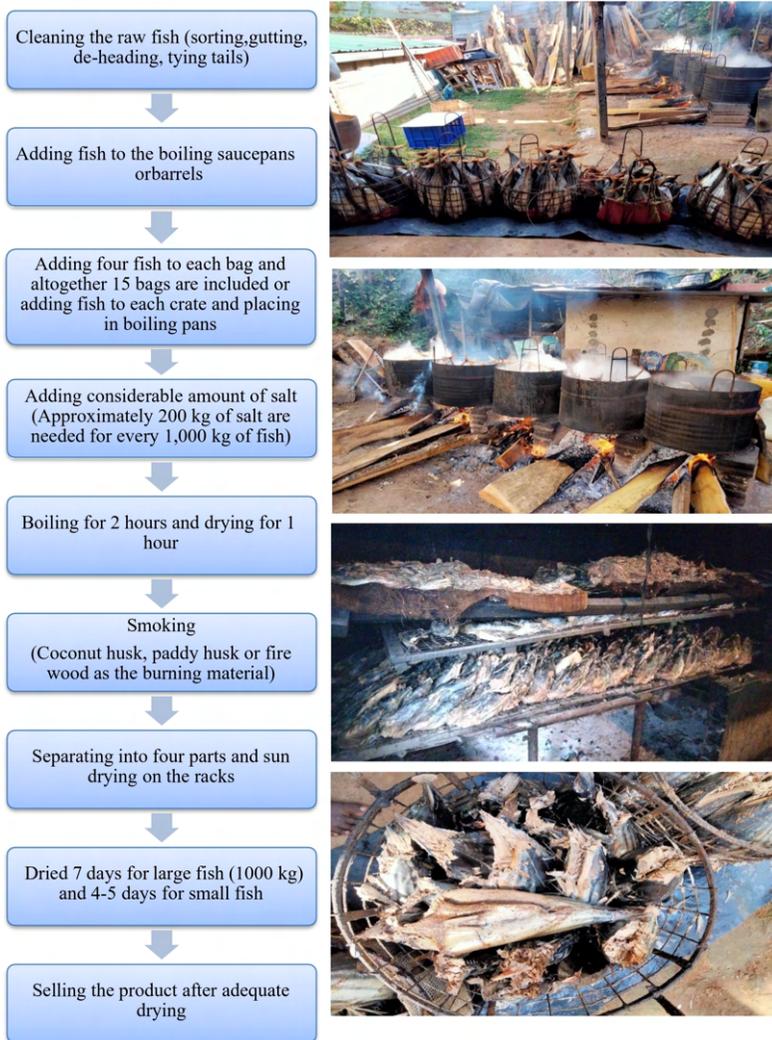


Figure 4. Maldivian fish processing steps: current. Source: Koralagama et al. (in review)

The contamination of the product during the processing stage is a matter of

serious concern, most notably the health hazards due to the use of plastic bags in boiling the fish and aluminum cooking pans in combination with acidic fruit for flavouring.

The Maldive fish value chain in Southern Province

Gender relations in the processing node

The number of workers and daily wages vary with the raw material, volume, and working hours. There is a clear gendered division of labour in processing. During processing of Maldive fish, most of the owners hire three persons to process 1,000 kg of raw material. Of the three workers, two are generally women and the other is male. Female workers help to boil the fish while the male worker cuts, de-heads, and disposes of the heads and all other discarded parts. In addition, two female workers are hired for the Maldive fish drying process after completing the boiling and smoking processes.

Female workers engaged in boiling fish earn LKR 1,500²² for working 5 hours per day, processing 1,000 kg of fish. This is 75 percent of the wage received by male workers engaged in cutting and de-heading, as men receive around LKR 2,000 for working the same number of hours (5) per day. Female workers engaged in drying Maldive fish are paid around LKR 1,000 for working three hours per day. Labor utilization by owners varies with their requirements. According to our survey, approximately 72 percent of owners hired both male and females for processing. Owners who hired only females relied on the males in their families to carry out the 'male' tasks. Around 17 percent of owners did not hire outside labour because they were not satisfied with the workers, or they preferred to do processing using only family labour.

²² US\$ 1= approximately LKR 186, during the fieldwork period.

Gendered mapping of the value chain

Gendered mapping (Mayoux & Mackie 2008; AgriProFocus 2012) of the Maldive fish value chain, based on two main locations, local and urban markets respectively, revealed several important characteristics in structure and function. Figure 5 shows the participation of men and women in the various functions of the two market segments as a percentage of the total numbers engaged.

While functions and activities dominated by women are visible, men get considerable support from their wives, daughters or hired female employees, and women’s involvement in supporting roles is often invisible or undervalued. Overall, there is a high functional integration of value chain actors, with the same actors engaged in the processing/wholesaling, processing/retailing, wholesaling/retailing or processing/wholesaling/retailing functions, especially in the local market segment.

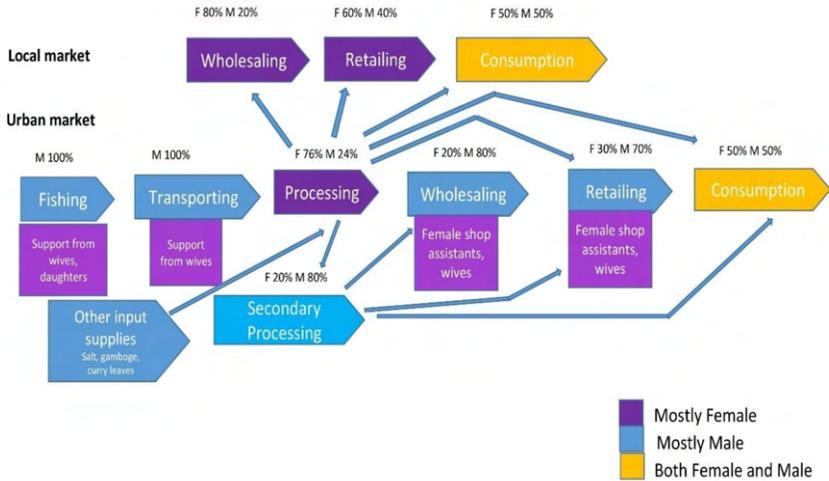


Figure 5. Mapping of value chain

Main actors in the value chain

Raw material suppliers: Fishers

While marine fishing has traditionally been a male-dominated activity influenced by a variety of social, cultural, and economic factors, women provide essential support for fishing activities, especially in financial management and providing meals. In addition, women sometimes engage in fishing-related activities, such as disentangling fish from nets, sorting fresh fish for sale and net mending, which are not always visible. Raw material suppliers in this value chain in the study locations were predominantly men, fishing offshore for several days at a time, landing their catch in nearby fishing harbours.

Transporters

Some processors use their own vehicles, such as lorries and three wheelers, to transport fresh fish from auction at the shore to processing enterprises. Owners and drivers of these vehicles are generally men, who purchase fresh fish from Mirissa, Kudawella, and Dondra fisheries harbours. Male workers in these locations load the fish onto lorries. The processor has to make a small payment (around LKR 20) to the loaders, in addition to transportation costs. Processors who do not possess vehicles of their own will rent a vehicle or hire a driver who specializes in transporting fish. They typically pay around LKR 4,000 as the transport fee; the transport cost per 1 kg of fish is around LKR 10–20, and varies with the distance.

Processors

Both women and men operate Maldivian fish processing enterprises within local fishing communities. Some processors are mainly dependent on family labour. However, most processors hire both female and male labour for processing Maldivian fish. Owners of processing enterprises, as well as workers, were predominantly female in the study locations. Processing techniques were passed down from their parents or grandparents.

Traders

Trading within this value chain can involve collectors, wholesalers, and retailers. The local market segment is dominated by the processors themselves or micro and small traders from the local fishing communities. Most of these local traders are women. Traders engaged in the urban market segment come from different towns and cities, such as Beruwala, Colombo, Negombo, Chilaw, and Kalpitiya on the west coast, Mirissa, Kudawella, Dondra, Hikkaduwa, and Ambalangoda on the south coast, as well as Kandy and Kegalle in the interior. These urban-based traders who purchase Maldivian fish are of Sinhalese and Muslim ethnicity and were predominantly male in the study locations. Some traders do frequent business, purchasing every week, while others purchase monthly or several times per month.

Consumers

Consumers of Maldivian fish comprise both women and men, distributed across the country. Maldivian fish is consumed as a flavour-enhancing condiment in a range of dishes, and thus a vital ingredient in the cuisine of all ethnic groups and social classes in the island. The quality of Maldivian fish is an important factor in consumer choice. Colour, smell, and texture are the most important characteristics on which purchases are based. The best quality Maldivian fish is required to be red inside, with a gold or dark black hue on the outer surface. Paler colouration both inside and out is considered a marker of inferior quality.

Value addition

As summarized in Table 2, processors and traders add value to the Maldivian fish product in several different operations. These include flavour enhancing spices added during the processing, sorting, and grading at the level of wholesalers, and transformation into flakes prior to retailing. Traders generally prepare Maldivian fish flakes; this is extremely rare at the processor

DRIED FISH MATTERS

level. There is also secondary processing into packeted or bottled ready-to-eat products, such as relishes and pickles, which are used as accompaniments in main meals (Figure 6).

Table 2. The process of value addition in the Maldivian fish value chain

<i>Stage of value chain</i>	Actions that provide value
<i>Processors</i>	During processing, some processors add a few ingredients to enhance taste. Gamboge, cinnamon leaves, and curry leaves are used based on the availability, processing volume, and market price.
<i>Wholesale</i>	Wholesalers practice sorting and grading to enhance value of Maldivian fish. Grading quality is determined by using three indicators. They are the colour pinkish red, appearance (glassy), and the sound ('tan, tan').
<i>Retailing</i>	Retailers break larger pieces of Maldivian fish into flakes and pack before sale, in addition to selling entire pieces.
<i>Secondary processing</i>	Following any of the stages described above, Maldivian fish can also undergo secondary processing to be retailed as ready-to-eat bottled or packeted products. Under this category, popular products include Maldivian fish sambal, (<i>umbalakada/maasi sambola</i>), caramelized onion sambal (<i>seeni sambola</i>), and chillie sambal (<i>katta sambola</i>). These products have gained increased popularity as they save food preparation time for modern consumers pressed for time. Fish guts and bones are also used for processed by-products; while fish guts are used for making chillie paste for human consumption, bones are often used in the production of animal feed.



Figure 6. Value added products: Maldivian fish flakes (left); Maldivian fish sambal (right)

Social wellbeing of value chain actors

The term ‘social wellbeing’ refers to an individual’s or a group’s social, economic, physiological, spiritual, and mental state of being. According to McGregor (2008), social wellbeing is: “A state of being with others that arises where human needs are met, where individuals and groups can act meaningfully to pursue their goals, and where they are satisfied with their way of life”. Thus, social wellbeing encompasses three dimensions - a material dimension focusing on needs and resources; a relational dimension that looks at social relations; and a subjective dimension that includes feelings and aspirations.

The wellbeing factors indicated by Maldivian fish processors and traders included all three dimensions of wellbeing (Table 3). Material wellbeing factors frequently mentioned included occupation, profit, assets, consumption, physical health, and education. Relational wellbeing factors indicated were clustered around support, responsibilities towards others and social relations within the family, kin, and community. Subjective wellbeing factors referred to satisfaction with life, peace of mind, mental health, entertainment, and religious belief and practice.

Table 3. Wellbeing factors

Material wellbeing	Relational wellbeing	Subjective wellbeing
<ul style="list-style-type: none"> • Occupation • Profit • Assets • Consumption • Health • Education 	<ul style="list-style-type: none"> • Support • Responsibilities • Social relations 	<ul style="list-style-type: none"> • Satisfaction • Peace of mind • Health • Entertainment • Religious belief and practice

Processors who engage in large-scale processing (6,000-7,000 kg fresh fish at a time) perceived that they had a good life in their village. Thus, approximately 30-40 percent of research participants said that they had a good life. Their

wellbeing was articulated in terms of a combination of material, relational and subjective dimensions.

We can live happily when the business is running smoothly without financial problems, family problems, and poverty. (Female processor, 38 years, Kottegoda)

They indicated that they have good relations with people and have maintained continuous communication with a number of traders. They referred to the ownership of valuable assets such as shops, vehicles, houses, and access to adequate space for drying.

Since I have plenty of space to prepare Maldive fish, I want to expand my business even further. This was started on a small basis by few residents of the village and has since grown into a large-scale operation. They [those who first started] have strong interpersonal relationships and work with many traders. They also have shops, vehicles, and houses. (Female processor, 48 years, Kudawella)

Peace of mind and freedom were also valued as a part of the good life.

We live happily in the village. We have provided a great help to those who work for wages by doing this business. If there is peace of mind, without problems, without jealousy, then happiness in life will be there with you. (Male processor, 50 years, Gandara)

We need money and mental freedom to live happily. If we can live in harmony without having disputes with others, then happiness in life is not far away. (Female processor, 63 years, Gandara)

Therefore, most processors and traders aspired to expand their businesses so that they could achieve a better life and social recognition. Many research participants said they were satisfied and thankful for their occupation because

it has provided a better standard of living over time. According to their perspective, Maldivian fish production and trading as occupations have the potential to generate good profit and savings. They desired regulatory protection of the industry and articulated that if imports of Maldivian fish were to be stopped, it would raise their living standard to a higher level.

Many women processors indicated that they were happy with this occupation as it was homebased and they could take care of both housework and their children. But commitment was perceived as essential to pursue Maldivian fish processing and trading full-time. Thus, sometimes they had to go for other important work. Their spouses, who were fishers or fish workers and spent their time at sea (for deep sea fishing), were rarely home. Therefore, they indicated that the love and affection needed for one's life were often missing. Taking care of the home and engaging in everyday livelihoods was mainly the responsibility of women themselves.

In terms of future aspirations, they do not wish their children to engage in Maldivian fish production. Similarly, children appeared to have little interest in their parents' work. One research participant mentioned that his younger son sometimes collected fish bones, dried and sold these to traders of animal feed to make pocket money which he used to buy stationery for school. Most processors and traders interviewed expressed the desire to provide a good education for their children, as they hoped that their children would engage in better professions than their own.

Some research participants expressed dissatisfaction with their occupation due to the hard work and difficult lifestyle, inadequate funds, and poor market linkages. They also referred to dishonest traders who made business transactions risky. A few also perceived that their occupation might not be consistent with their religion, Buddhism. This is because fishing involves taking life and occupations associated with taking life are considered to contravene the Buddhist principle of 'right livelihood'. However, they indicated that they had to practice this form of livelihood as they did not have any other options. In some cases, it was mentioned that they had made up their mind to quit the occupation gradually. In aiming to increase their subjective wellbeing, they contributed to a number of religious

rituals at their local temples, such as giving alms to the monks and making financial donations for the Katina festival whenever possible. The 2,500-year-old Katina festival commemorates the Buddhist year's major alms-giving ceremony; it happens in October and November, at the end of the Vassa, or monsoon season.

In analyzing their perceptions of social wellbeing, some noteworthy changes in Maldivian fish processing livelihoods emerge. The turnover of sales has increased remarkably over the last few decades, with increased quantities of fish being processed. Expanding their business, increasing sales, improving customer networks, educating their children well, buying a vehicle, and leading a better life than at present, are major expectations articulated for their lives over the next 10 years.

Constraints and opportunities

Constraints

Maldivian fish processors identified many more constraints in pursuing their livelihood than opportunities. For most processors, the main problem they experienced was the lack of adequate space to dry Maldivian fish after smoking. The land available for processing has gradually decreased. As they can process only around 200-300 kg at a time in a small yard, profit margins are low. Direct sunlight is reduced due to crowded housing conditions.

Insufficient marketing conditions and opportunities were also highlighted as a constraint. Traders sometimes purchase Maldivian fish on credit and abscond without settling their bills. Processors need to pay fresh fish traders on the date of purchase or within two days. However, if buyers of Maldivian fish do not follow the same time frame of payment, processors face issues of continuing production or suffer losses. Local processors additionally face difficulties in competing with imported Maldivian fish sold at a cheaper price. Therefore, a specialized Maldivian fish selling center, managed by a person with a sound knowledge of the field, was suggested as a solution. Research participants perceived that wholesale traders, supermarkets and retailers

could purchase directly from such a selling center without the intervention of middlemen.

The absence of price stability for both fresh and dried fish was mentioned as another constraint. When fresh fish prices are high, processors find it difficult to find traders to sell their products and turnover is lower. When fish prices fall, the processed Maldivian fish is sold at lower profit. During COVID-19 fresh fish prices decreased overall, except in December to February when the fish catch is generally low and prices increase. Although the Maldivian fish price also increases during this time, most processors and traders do not like to pay the higher prices as consumers do not necessarily buy Maldivian fish at such high prices. During the COVID-19 pandemic, when large catches of fish were available, there were no customers to buy Maldivian fish. Instead, the demand for other dried fish products increased. However, this situation might change in the future. Processors also mentioned that since the Burevi cyclone of December 2020, there has been a scarcity of fresh fish and an increase in fish prices.

A lack of affordable modern technology is another constraint faced by processors. There are ovens with drawers, where the stock can be dried during the rainy season without spoilage. However, not all processors can afford these. During the boiling process some processors use woven plastic produce bags. They place four fish in one bag and put it into the barrel to prevent breakage, reusing the same bag to reduce expenses. When heat is applied, chemical components of the bag, such as dye and microplastics, mix with fish and cause health hazards. While metal crates can be used, these are considered too expensive.

Earlier, processors dried processed Maldivian fish on the ground. After being strictly advised by the Public Health Inspector (PHI) and Fisheries Inspector (FI) not to do so for hygienic reasons, racks came to be commonly used for the drying process. Disposal of fish heads and other waste is another health issue related to processing. While many processors dry much of the waste to sell as chicken feed, the remaining waste is often thrown into lagoons, causing pollution and health hazards.

Another technological constraint is the inadequate use of ice by fishers

or traders between the time of catch and delivery at the shore, a practice that negatively affects the quality of the raw fish sourced. Processors often recognize the quality of the raw fish only after boiling. This can result in financial losses, as some fish needs to be discarded. Lack of storage was a constraint mentioned by processors as well. If there were no sales the processed fish needed to be continuously aired under the sun to prevent contamination, resulting in reduction of weight and financial losses.

An additional constraint indicated by processors was the weather. The rainy season from May to June prevents Maldivian fish processing over a period of several weeks. Even in other seasons rain is unpredictable, and material costs include the use of polythene sheets to cover racks, in order to minimize the possibility of seepage and to preserve the dryness of the product. Moreover, vigilance over the weather, and covering and uncovering the fish depending on rain or sun, also entailed labour costs. The unpleasant smell that emanates from the fish during the rainy season was also considered a hindrance.

Thus, lack of space, poor market opportunities and access to credit, and lack of training offered by state institutions or NGOs on new methods and technology to improve the quality of the product and manage their enterprises efficiently, are the main constraints faced by processors.

Opportunities

Maldivian fish processing is an important and preferred source of income for women in the study locations on the south coast, as it enables working from home. As women possess knowledge, skills, and experience in this occupation, it provides a space for them to achieve better economic returns and wellbeing. Moreover, it is a sphere in which women are not only workers but also owners of micro and small enterprises, and thus provides potential for women to upscale to medium enterprises and to engage in value addition. There are increased sales opportunities during the festival seasons, such as Sinhala and Tamil New Year, and Christmas.

The long shelf life of Maldivian fish provides an additional opportunity for processors and traders. As Maldivian fish can be stored for over a month

without an impact on its quality, they can retain stocks whenever possible and limit losses due to market fluctuations. Additionally, as Maldivian fish processing has been practiced in these fishing communities for a considerable length of time, skilled and experienced employees are available, providing the opportunity to supply a high-quality product to the market. Imports of Maldivian fish from foreign countries were limited due to the COVID-19 pandemic. This was a benefit indicated by processors and traders, as demand for local products has soared.

In addition, there is increased demand for ready-to-consume packages and bottled products containing Maldivian fish in the urban market segment, and opportunities for secondary processing could bring increased economic returns to local processors. Capturing these emerging new markets, however, would require access to training, technology, and credit to increase the quality of the product.

Conclusion

Maldivian fish, as a condiment made mainly from tuna varieties, is an important component of Sri Lankan cuisine of all ethnic groups and social classes. Originating as a food item in the Maldivian Islands, Maldivian fish has been produced in Sri Lanka for many decades. Based on gendered value chain analysis in four study locations on the south coast, we determined that women play a predominant role in the processing node of both the local and urban market segments, as well as in the trading node (wholesaling and retailing) in the local market segment. However, sourcing of raw materials (fishing) and transport in both segments, and trading within the urban market segment, is mostly in the hands of male actors. Processing techniques have changed somewhat during the last 10-15 years but training, credit, and new technology to improve the quality of the product and marketing conditions within the value chain overall remain inadequate. Moreover, the use of plastic bags in the boiling stage of the process and aluminum pans in combination with acidic flavour-enhancing substances poses health hazards to consumers. As Maldivian fish processing constitutes an important livelihood for the social

wellbeing of fishing households, especially women, in the study locations, addressing the issues of improving markets, enhancing product quality, and preventing health hazards is critical.

References

- AgriProFocus. 2012. *Gender in value chains: Practical toolkit to integrate a gender perspective in agricultural value chains*. Arnhem: AgriProFocus.
- Cutting, C.L. 'Fish: Processing and Preservation.' H.S. Offset Press. (1996): 1-2.
- FAO Species Catalogue. 1983. *Scombrids of the World: An Annotated and Illustrated Catalogue of Tunas, Mackerels, Bonitos and Related Species Known to Date*. Food and Agriculture Organization of the United Nations, Rome.
- FAO-FIGIS. 2001. *A World Overview of Species of Interest to Fisheries*. FIGIS Species Fact Sheets, Species Identification and Data Programme – SIDP, FAO-FIGIS. May 30, 2005. www.fao.org/figis/servlet/species?fid=2900.2p.
- Koralagama, Dilanthi, Shalika Wickrama, and Anupama Adikari. 2020. *A Preliminary Analysis of the Social Economy of Dried Fish in Sri Lanka*. Dried Fish Matters Project. Literature Review Report.
- Koralagama, Dilanthi, Shalika Wickrama, Anupama Adikary, and Thilakshana, U.P.G.K.J. In review. *Socio-Economic Assessment on Dried Fish Value Chain in Sri Lanka*. Dried Fish Matters Sri Lanka. Draft Scoping Report.
- McGregor, Allister. 2008. *Well-Being, Poverty and Conflict*. Bath: University of Bath. ESRC Research Group on Well-being in Developing Countries. Briefing Paper.
- Mayoux, L. and Mackie, G. 2008. *A practical guide to mainstreaming gender*

15. MALDIVE FISH PROCESSING IN SOUTHERN SRI LANKA

analysis in value chain development. Addis Ababa: ILO.

16. Fish Fermentation in the Floodplain: A Photo Essay

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Summary

Fermenting fish is a familiar strategy of food preservation in Bangladesh. Although a number of fermented fish products are available, the most popular is *chapa* or *shidol*. Chapa has long been an important food in local diets, particularly in the north-central, north-eastern, and southern hilly regions. It is a delicacy and a common protein source in the diet of poor and middle-class people.

Thousands of men, women, and children are involved in the fish fermentation sectors. They supply the raw fish and are engaged in processing, which includes drying and fermenting, and in trading. This photo essay traces the process of making, marketing, and consuming chapa across the value chain. We aim to contribute an appreciation of the socially embedded practices around chapa and hence broaden understanding of fish fermentation in the floodplains of Bangladesh.

Introduction

Fish is a natural complement to rice in the national diet of Bangladesh, giving rise to the adage '*Maache-Bhate Bangali*', literally meaning – 'fish and rice make a Bangladeshi'. The fish sector, second only to agriculture in the overall economy of the country, contributes nearly 60 percent of the daily animal protein intake, and 3.5 percent of GDP (DoF 2020).

Fish fermenting has long been a common strategy of food preservation in Bangladesh. Four different types of fermented fish products – chapa or shidol (alternatively shidhal), *nga-pi* and *lona ilish* – are produced in the country. The most popular of these is chapa or shidol. In terms of production and trade volume, chapa represents more than 80 percent of the fermented fish produced in Bangladesh. Chapa has long been a regular part of the diets of people of almost all categories particularly in the north-central, north-eastern and southern hilly regions of Bangladesh. Fermented chapa is produced in the floodplains of Mymensingh, Sylhet, Comilla, Netrokona, Brahmanbaria, Jamalpur, Sherpur and Kishoregonj (Hossain et al. 2015). Thousands of men, women, and children are involved in the wider value chain of chapa – in fishing, supplying raw fish, processing (drying and fermenting), and trading. The chapa is not only consumed locally but has high demand in overseas, as well, for affluent non-resident Bangladeshis living mainly in Europe and USA and poor labourers working in Middle Eastern and East Asian countries. Traditionally Bangladeshi women, particularly rural women, are seen as most fond of food products that are hot and spicy with strong flavour to a greater extent than the men in the households. Accordingly, women are considered to like chapa more than men.

Commonly four freshwater barbs and four coastal anchovies are used as raw fish to produce chapa along with a number of freshwater and marine fishes that are occasionally used.

DRIED FISH MATTERS

Table 1. The fish species used to produce chapa

Uses	Common English name	Scientific name	Bangla name	Waterbodies*
Major species	Swamp barb	<i>Puntius chola</i>	<i>Chala punti</i>	R-F
	Pool barb	<i>P. sophore</i>	<i>Bhadi punti</i>	R-F
	Ticto Barb	<i>P. ticto</i>	<i>Tit punti</i>	R-F
	Spotted sail Barb	<i>P. phutunio</i>	<i>Phutani punti</i>	R-F
	Hairfin anchovy	<i>Setipinna phasa</i>	<i>Phaisa</i>	E-R
	Scaly hairfin anchovy	<i>S. taty</i>	<i>Teli phaisa</i>	E-R
	Hamilton's thryssa	<i>Thryssa hamiltonii</i>	<i>Phewa</i>	E-R
Occasionally used	Oblique-jaw thryssa	<i>T. purava</i>	<i>Phewa</i>	E-R
	Rosy barb	<i>Puntius conchonus</i>	<i>Kanchon punti</i>	R-F
	Olive barb	<i>P. sarana</i>	<i>Sarpunti</i>	R-F
	Coitor croaker	<i>Johnius coitor</i>	<i>Poa</i>	E-R
	Kuria labeo	<i>Labeo gonius</i>	<i>Gonia</i>	R-F
	Butter catfish	<i>Ompok pabda</i>	<i>Modhu pabda</i>	R-F
	Butter catfish	<i>O. bimaculatus</i>	<i>Kani pabda</i>	R-F
	Hilsa shad	<i>Tenualosa ilisha</i>	<i>Ilish</i>	E-R
Toli shad	<i>T. toil</i>	<i>Chandona Ilish</i>	E-R	

*The sources of the fresh/raw fish; R-F – River and Floodplain; E-R – Estuary and River

16. FISH FERMENTATION IN THE FLOODPLAIN: A PHOTO ESSAY

Table 2. The *chapa* stakeholders

Stakeholder groups	Involvement in the <i>chapa</i> value chain
Fishers	Permanent or part-time. Catch fish from rivers, floodplains, and marine environments and bring to landing centers, wholesale, and retail markets.
<i>Aratdars</i> (Wholesaler)	Mostly act as commission agents Fermented fish yard owners purchase fish from them though auction. <i>Aratdar</i> , after keeping commission (2-5% of the sale price), pay the fishers.
Yard owners	Owner of one or more fermentation units. Arrange capital, hire labour, purchase raw materials, and send ready-to-sell products to wholesalers.
Moneylenders	Give loans to yard owners, fishers and others, charge high interest but provide loans anytime without much paperwork and collateral.
Labourers	Permanent and temporary labour, including children and women, involved with day to day activities: bringing raw fish, salting, processing (gutting, scaling, washing, cleaning, salting) drying, packing etc.
Punti oil producers	Usually, women involved in gutting and scaling of freshwater barbs who collect the guts, scales and other byproducts. Upon arrival at the home, they boil the collected materials and extract the oil. Yard owners purchase the oil which they use to condition the earthen containers used for fermentation.
<i>Motka</i> (earthen container) Conditioner	These workers condition the earthen container (known as <i>motkas</i>) using punti oil.
<i>Motka vorani</i>	Fill the conditioned earthen containers with semi-dried fish using special techniques.
Storage area owners	Once the earthen pots are filled, the yard owners bring the sealed containers to the storage owners and store them for 4-6 months to allow proper fermentation. Storage owners charge money to the yard owners depending on how long the pots are stored.
Wholesalers	Generally, wholesalers are rich businessmen and have wholesale shops in large markets. They purchase fermented fish from the yard owners with cash and credit.
Retailer	Retailers have small shops in fish markets or at the side of roads. They also can be mobile street vendors. They purchase fermented fish from the wholesaler using cash and credit.
Consumer	Mostly poor and middle-class people of the greater Sylhet-Mymensingh-Dhaka divisions consume <i>chapa</i> . There are two common preparations: <i>chapa</i> paste and <i>chapa</i> curry with vegetables. Commonly, women are held to prefer <i>chapa</i> more than the men.

The Process



Figure 1. a) Fishers catching freshwater barbs and other fish in the haor (floodplains) of Mithamoin Upazila (subdistricts) of Kishoreganj District in northern Bangladesh to supply to drying yards. b) A group of coastal Fishers catching anchovies, Bombay ducks, and eel gobies at a fishing ground in the Meghna River Estuary. The catch will be dried in marine fish drying yards.



Figure 2. a) Fish are purchased by Yard Owners in a wholesale market in

16. FISH FERMENTATION IN THE FLOODPLAIN: A PHOTO ESSAY

Sylhet to be brought to one of the largest fish drying, fermenting, and trading sites in the northeast – Massimpur by the river Surma. b) **Cart Pullers** in Nazirar Tek in Cox’s Bazar bring a cart full of small marine fish purchased by a drying yard owner in the fish landing site close to one of the largest fish drying yards on the Bay of Bengal coast. For delivery of each cart full of fish from landing center to the drying yard (distance about half a mile), the cart pullers each receive Tk. 100-150 (USD \$1 to USD \$1.20).



Figure 3. a) Marine fish are sorted (species-wise), washed, cleaned, and salted in a Nazirar Tek drying yard, Cox’s Bazar. Most of the **Labourers** are Rohingya (a stateless community from Myanmar) women and children. b) **Labour** - Women and children are processing (removing scales, fins, and gut) freshwater barb in the haor (floodplain in the north-eastern part of Bangladesh) region of Sunamgonj.

DRIED FISH MATTERS



Figure 4. a) During processing of freshwater barbs (punti), the guts and other byproducts are collected to produce oil for conditioning the earthen pots used for fermentation. b) A women **Punti Oil Producer** is boiling the punti guts and other byproducts to extract oil. She will sell the oil to fermentation **Yard Owners** @BDT 150-200/L.



Figure 5. a) Freshwater barbs (punti) are sun-dried in the Hakaluki Haor area, Sunamgonj caught from nearby floodplain. The semi-dried punti will be fermented to produce chapa. b) Anchovies are sun-dried in Nazirar Tek. When they are semi-dried, they will be packed and sent to floodplain areas of Sylhet, Brahmanbaria and Mymensingh for fermenting to produce chapa.

16. FISH FERMENTATION IN THE FLOODPLAIN: A PHOTO ESSAY



Figure 6. a) A **Motka Conditioner** is rubbing punti oil on the inner and outer sides of earthen containers (motka) to condition them. Conditioning is essential as fish won't be properly fermented if the container is not prepared in this way. The pot needs to be rubbed with oil several times over the course of two to three days of sun-drying until the pots can no longer absorb any more oil. b) Earthen containers are rubbed with punti oil and placed on the bank of the river Surma, Massimpur, Sylhet for sun-drying to ensure proper conditioning.



Figure 7. a) A **Motka Vorani** (Container filler) washes and soaks semi-dried fish in the water of the river Surma, Massimpur, Sylhet. b) The earthen containers are in position (half-buried). Conditioned containers are ready to

DRIED FISH MATTERS

be filled with wet semi-dried fish by pressure (in Bangla 'chap', the root of the term 'chapa'). To make the containers airtight, at the top of the pressed fish dried punti powder is spread over the fish and the contained wrapped and sealed with a plastic sheet.



Figure 8. a) Sealed containers (motka) filled with fish in Lalpur Fermentation Yard (the largest fish fermentation facility of Bangladesh), Ashugonj, Brahmanbaria. b) The fish-filled containers are stored in a shady storehouse for about 6 months to allow fermentation, Lalpur, Ashugonj, Brahmanbaria.

Storage Owners charge BDT 50-100 for each container from the fermentation yard owners.

16. FISH FERMENTATION IN THE FLOODPLAIN: A PHOTO ESSAY



Figure 9. Once properly fermented, chapa containers are sent to different wholesale markets by the yard owners. Often middlemen purchase from the yard owners and sell chapa in wholesale and retail markets.



Figure 10. Retailers and street vendors sell chapa to **Consumers**. Puntı chapa (BDT 800-1200/kg) fetches 3-4 times higher price than the phaisa chapa (BDT 250-350/kg) at the consumers' level. a) Phaisa (marine anchovy) chapa. b) Puntı (freshwater barb) chapa.



Figure 11. a) A **Retailer** selling punti chapa along with other dried fish in a rural market in Mymensingh. b) Wonderfully arranged Phaisa chapa in an aluminum bowl to attract **Consumers** in a retail market in Sylhet.



Figure 12. Rural women prepare a number of mouth-watering dishes from chapa. a) Punti chapa (under the spoon) cooked with sweet gourd and spices – salt, turmeric, vegetable oil, coriander powder, ground cumin seed, ginger, onion, garlic and chili powder and served with a number of fried, mashed, and curried leafy vegetable and gourds. b) The tastiest hot and spicy garlic chapa (*bhuna*) - chapa and all the spices except garlic are dry-roasted in a pan for five minutes and garlic and lukewarm water added and boiled for ten more minutes.

Conclusion

Fermented fish, particularly chapa, has long been a traditional and highly popular food in Bangladesh. Chapa is particularly important for poor consumers, and its production provides a livelihood for large numbers of people who have few alternatives from Sylhet, Mymensingh, and Comilla floodplain areas. In general, it is a delicacy for poor and middle-class consumers from these areas, but many better-off households also regularly consume fermented fish, and there is high demand among non-resident Bangladeshis, particularly people originating from Sylhet and living in the UK and Bangladeshi workers originating from north-east and north-central Bangladesh working in the Middle east, Saudi Arabia, and other countries.

Note

All photos in this chapter are by Mostafa A. R. Hossain.

References

DoF, 2020. National Fish Week Compendium (in Bangla). Department of Fisheries, Ministry of Fisheries and Livestock, Bangladesh. 160 p.

Hossain, M. A. R., Belton, B. and Thilsted, S. H. 2015. Dried fish value chain in Bangladesh. WorldFish, Bangladesh and South Asia Office, Dhaka, Bangladesh. 122 p.

17. Coastal and Inland Dried Fish Value Chains in Sri Lanka: A Photo Essay Exploring the Processing Node and its Linkages

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Summary

The goal of this chapter is to explore the processing node and its linkages within two distinct dried fish value chains in Sri Lanka to gain insights into their organization and functioning. The two value chains we present include a coastal marine value chain and an inland freshwater value chain, with a series of photos to enable visual engagement. In doing so, we outline the activities

within the processing node, their structural organization, and linkages to adjacent fishing and trading nodes. The accounts we present also encompass resource usage, livelihood aspects, and place-based connections of these value chains, including gendered tasks and responsibilities. We conclude the chapter with a broad comparison between the two study value chains and brief reflections on areas for further investigation.

Introduction

Dried fish value chains are an important sub-sector of small-scale fisheries that support fishing livelihoods and local economies, predominantly in the Global South. Despite their importance, dried fish value chains remain hidden and undervalued (Belton et al. 2022). In particular, the organization and functioning of activities and nodes that comprise dried fish value chains have been rarely documented and poorly understood. Better understanding of the workings of these value chains is crucial to identify the opportunities to improve them to better support the livelihoods of those who participate in them.

The goal of this chapter is to explore the processing node and its linkages within two distinct place-based dried fish value chains in Sri Lanka to gain insights into their organization and functioning. The processing node of the value chain warrants special attention as it encompasses the land-based activities where raw fish is transformed to dried fish, a product that can be stored at ambient temperature. The processing node therefore primarily sets apart a dried fish value chain from other similar value chains such as fresh fish chains and cold chains. Due to processors' engagement in multiple activities, it is also anticipated that the exploration of the processing node will provide insights into its linkages to the adjacent nodes of the value chain.

The two value chains presented here represent urban coastal dried fish production and inland freshwater artisanal dried fish production. They have been carefully selected based on several criteria and in consultation with the local researchers. The selection criteria included type of fishery (marine vs. freshwater), location (urban coastal vs. inland rural), and evidence

of both men's and women's involvement. The value chains were studied from January to October 2021 using in-depth interviews with dried fish processors (n=70) and key informant interviews (n=19). Key informants included the stakeholders who have influence over the institutional and governance context of dried fish such as the fisheries managers, harbour officials, development officials, and community leaders.

Sri Lanka is a tropical island in the Indian Ocean located approximately 100 km from the southeastern coast of India. The island has 1,770 km of coastline and an Exclusive Economic Zone (EEZ) that spans over 517,000 km². The fisheries sector of the country is considered small in scale, comprising both marine and inland fisheries. Marine fishing activities take place in coastal waters, within the EEZ, and beyond in international waters. Sri Lanka has also 2,600 km² of freshwater bodies (natural and human-made) that host inland fisheries.

Salting and sun-drying, smoking, and pickling are the traditional fish processing methods in Sri Lanka. Dried fish is a major source of animal protein in local rice-based diets and an important culinary ingredient. Local annual dried fish production has steadily increased over the past couple of decades from 24,000 Mt in 2,000 to 64,000 Mt in 2017, although about 30 percent of the local demand is being met through imports (Fisheries Statistics 2019). Marine fish is processed along the entire coastal belt around the island. Substantial inland dried fish production also occurs, mainly surrounding the perennial reservoirs of the country.

The following section explores in detail the activities associated with the processing nodes of the two study value chains.

Kalutara coastal dried fish value chain

Kalutara is an urban coastal district in the Southwestern province of Sri Lanka. There are nine fisheries divisions along the coastal strip of Kalutara district. Most recent fisheries statistics report about 80 households engaging in dried fish processing. In 2020, 1,047,300 kg of dried fish production was recorded in the entire district. This volume suggests that about 40 percent of

the total fish harvest was processed as dried fish during that year (total fish harvest volume was 2,740,200 kg) (Fisheries Statistics 2020).

The data collection took place in the communities of Payagala, Maggona, and Beruwala (Figure 1). Salting and sun drying is the main fish processing method in this area.²³ Fish drying activities are organized as private-owned independently managed businesses. They range from small to medium scale businesses and use family labour and/or hired casual wage labour, depending on the volumes processed. Most processing sites operate year-around while some are home-based small seasonal operations. Commonly dried fish varieties include both large/medium-sized fish such as skipjack tuna, queen fish, yellowfin tuna, dolphin fish, sharks, rays, and Indian scad as well as small pelagic fish species such as anchovies and smoothbelly sardinella.

Gendered tasks and responsibilities

About one third of the fish drying workforce is comprised of women. They are expected to perform salting, washing, and drying activities whereas cutting and carrying are designated as men's activities. This division of tasks is shaped by the local attitudes and perceptions around the need to assign 'heavy work' to men. However, in practice, both women and men collaborate in performing the tasks depending on labour availability and the fish volume to be processed in a given day. In fact, in a few drying sites it was observed that the entire operation is handled only by women.

Gendered differences also exist in ownership and handling of drying operations. Men own and manage all the small and medium scale operations while employing workers belonging to both gender groups. In contrast, home-based small fish drying operations are often handled by women with assistance from family members, especially during peak seasons. Some of these women also engage in selling dried fish in roadside stalls within the

²³ Pickling of small pelagic fish (locally known as 'jaadi') is also a traditional method of fish preservation in Sri Lanka, although this method is rarely practiced today. A small quantity of fish is also processed as Maldiv fish, which involves the additional steps of boiling and smoking prior to sun-drying.

community. All sales operations outside the village are handled by men.

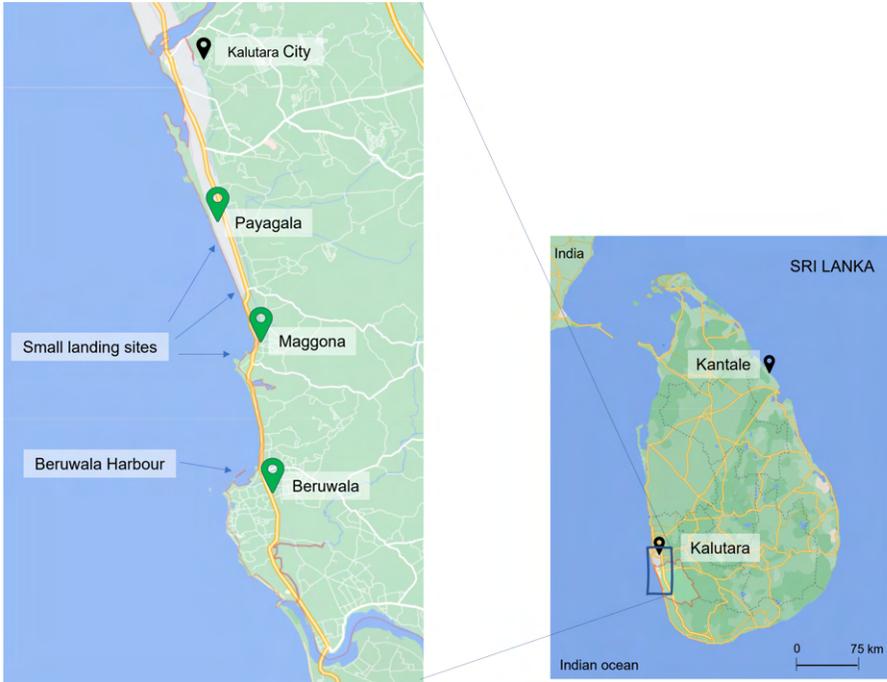


Figure 1. Study communities in Kalutara. Source: Google maps

Processing related activities and organization

Sourcing of raw fish for drying

Raw fish used for dried fish production is supplied through three main sources: auction at the fishing harbour, small landing sites and seasonal beach seine landing sites, and excess fish stocks bought from other places in the country.

a) Outdoor auction at Beruwala fishing harbour

The main source of fish used for drying is from Beruwala harbour, one of the

main fishing harbours in the country. All the activities at the harbour auction are performed by men, therefore, women are rarely seen at the harbour.

Fish landed at the harbour are caught by multi-day fishing vessels (30"-45" in length with capacity for ice storage) in offshore fishing trips that last about 30-40 days. The types of gear used are gill nets, long lines, and coarse nets (local name for small purse seines targeting schooling fish such as Indian scad). About 15 multi-day vessels land in the harbour each day. Each boat lands a catch volume of about 12,000-15,000 kg during each trip, however, these catches are typically considered of lower quality due to the longer duration of preservation in ice. Smaller vessels (28" in length) also land at the harbour. These vessels are used for 5-6 days fishing trips within the country's territorial waters and these catches are considered fresh.



Figure 2. Multi-day fishing vessels (Left) and the entrance to the auction at the fishing harbour (Right). Credit: Wedige Chathurika Hiroshini, 2021

The fish auction at the harbour starts around 5 am each day. Fish stocks to be auctioned (boatloads) are graded into three grades based on quality. First to be auctioned is the fresh fish —grades 1 and 2 — destined for different local markets. Grade 3 ('kapana maalu') is typically used for drying, although grades 1 and 2 are also used during peak seasons. The auctioning of Grade 3 fish begins around 7 AM. An estimated 5,000 - 6,000 kg of fish is sold each

DRIED FISH MATTERS

day for drying in nearby sites at a rate around CAD 2.25/kg (=LKR 350/kg).²⁴ These transactions happen largely based on credit relations underpinned by local networks of contact and trust relations, although some processors prefer to buy with cash.



Figure 3. Skipjack tuna stocks sold for dried fish making. Credit: Ishan Weththasinghe, 2021

Partially processed fish at sea

In addition to raw (iced) fish, each multi-day boat also lands about 5,000 - 6,000 kg of partially processed fish, mostly Skipjack tuna. Partial processing at sea entails beheading, gutting, cleaning, and storage in salt brine in plastic barrels (Figure 4). Partially processed fish is locally referred to as 'lunu maalu' (salted fish). The quantity of salted fish landed is higher during rainy or stormy weather. The barrels of salted fish are purchased by the dried fish producers at a lower price than raw fish (CAD 1.92/kg = LKR 300/kg).

²⁴ Price levels as of April 2021 at an exchange rate of: 1 CAD = 156 LKR (Sri Lankan Rupees)



Figure 4. Barrels of partially processed fish. Credit: Lakshitha Fernando, 2021

Fully processed fish at sea

A much smaller quantity of fish, 200-500 kg/boat, is also fully processed at sea (cleaned, salted, and dried) and landed by the offshore fishing vessels. Boat dried fish, referred to as 'bottu karawala', is popular among locals for its unique taste, texture, and perceived high quality. Upon arrival, it is customary that the boat owners share several of these bags among crew members as a gift in appreciation of labour at sea during the long fishing trips.



Figure 5: Boat dried fish. Credit: L. Fernando, 2021

b) Traditional small landing sites and seasonal beach seine

Several small traditional landing sites, called ‘thotupola’, are also located along the coast in Thudawa, South Payagala, North Payagala, and Maggona. Each of these landing sites has about 3-10 small boats, traditional-style 18½” fiberglass canoes with a single outrigger (Figure 6) or an outboard engine. These boats are mostly used for day trips (from dawn to 11 am) in coastal waters. Only a small portion of these harvests are used for dried fish production as the quality of fish is higher due to the shorter duration of the trips. These fish catches are referred to as ‘dawal maalu’ (daytime fish).

The Kalutara area is also known for its intergenerational seasonal beach seine fishery that operates from around October to March (Figure 6). Fish availability during the season largely depends on the rhythms of the sea. Calmer and shallower coastal waters (locally referred to as ‘walaala muhuda’) are considered ideal for this fishery. However, the number of beach seines in operation has drastically reduced over the past few years: from 135 in 2016 to 40 in 2019 (Fisheries Statistics, 2019). Beach seines target smaller pelagic fish such as anchovies and sardinella, which are very popular among locals in dried form. According to fishers, the sharing of common beach space between fish drying people and beach seine fishers is governed by local traditional practices, which give priority to the beach seine when in operation.



Figure 6. Traditional boat landing (Left) and a beach seine stored away during off-season (Right). Credit: L. Fernando, 2021

c) Fish bought and transported from other fishing harbours

Large excess fish harvests from other areas, such as the Southern areas of Galle, Kudawella, Tangalle, and Mirissa, and sometimes also from Western areas such as Negombo, are purchased by the processors using established contacts. The fishers then arrange the transportation of these fish stocks by lorries directly to the drying sites in Kalutara area. The size of these stocks can go up to 5,000 kg per lorry.



Figure 7. Large dried fish sold as pieces (Left) and small dried fish sold as the whole fish (Right). Credit: Sachindu Weththasinghe, 2021

Cleaning and salting of raw fish

The drying node involves a series of activities that takes place once the fish arrives at the drying site. First, the fish is cleaned by de-heading and gutting. For bigger fish, a few small cuts are made on each side of the fish to allow better salt absorption, and washed with running water. The amount of salt to be rubbed is determined by experience (some workers described it as when the red colour of ‘meat’ becomes invisible). Smaller fish varieties (e.g., Indian scad) are cleaned by removing only the guts.

The fish are salted the same day by carefully rubbing with salt, and then stored in barrels or concrete tanks (tanks are used in most medium-scale

DRIED FISH MATTERS

operations) for a period of two days to a week depending on the weather and the availability of drying space. Barrels are often tightened with the lid or using a polyethene cover to protect from fly infestations. Lid-less barrels are also often seen with a heavy rock placed on top of fish to ensure that the fish is submerged in salt water as salt also acts as a fly repellent (Figure 8).



Figure 8. Salting barrels. Credit: L. Fernando, 2021

Washing and preparation of salted fish for drying

Washing mostly happens in batches and only in a quantity that can be handled based on space availability and also the weather patterns (drying takes longer during cloudy days or during intermittent rains and it is not done at all during heavy rains). Most places use a shallow concrete tank for washing. Salted fish is brushed to remove excess salt and washed well with running water just before sun drying. For the fish salted at sea (partially processed), the fish is washed directly and sun dried within 2-3 days.



Figure 9. Washing off excess salt (Left) and draining the fish before sun drying (Right). Credit: W. C. Hiroshini, 2021

Sun drying

Sun drying is done at drying sites on private lands closer to the beach, some of which are the backyards of the processors' homes. The sun drying process takes about 2-3 days and the fish are laid out in a single layer to dry in the morning, flipped once in the afternoon, and stored away each evening until fully dried. Drying is done mostly on large coir mats spread on the ground, outdoor cement floors or on permanent drying racks (Figure 10). In some cases of home-based micro-scale operations, drying is done on the roofs or on rocks at the beach. Once fully dried, the weight conversion ratio of raw fish to dried fish is about 3:1.



Figure 10. Sun drying using coir mats (Left) and drying racks (Right). Credit: L. Fernando, 2021

Trading and distribution

Dried fish is traded using several main channels – wholesale shops, small traders who buy and sell, roadside retail stalls, and selling directly to consumers who visit the processing sites. Larger dried fish stocks (1,000-2,000 kg) are sold to mostly dried fish wholesalers in Colombo. In addition, some processors also send their stocks to traders in regional produce markets (e.g., Dambulla, Kandy), who then supply to retail shops across the country. Many small traders, who buy and sell in relatively smaller quantities, also arrive at the drying sites to purchase and distribute in smaller quantities (10-50 kg). They sell to retailers in inland areas, sell in farmers’ markets or sell directly to consumers.

Roadside dried fish stalls along the coast, especially in Maggona and Beruwala, are popular for both smaller and medium quantity purchases by consumers and small traders. There are about 15 such stalls, each carrying a range of dried fish products. These products sometimes include dried fish produced in northwestern or northeastern areas of the country, and sometimes also even imported products (e.g., anchovies or queen fish).



Figure 11. Roadside dried fish stalls in Beruwala. Credit: W.C. Hiroshini and L. Fernando, 2021

Kantale inland dried fish value chain

Kantale is a small inland town located in the Trincomalee district of Northeastern Sri Lanka. As shown in Figure 12, the study communities included Agbopura, Wewsirigama, Mollipathana, Galmitiyawa, Jayanthigama, Suriyapura, and Seeni Kamhala.

Kantale is locally well-known for its freshwater fishery and artisanal dried fish production. Traditionally, salting and sun drying, and smoking are the main methods of fish processing. Fish drying operations are dispersed across the villages surrounding the freshwater bodies, which include Kantale reservoir and many other perennial and seasonal lakes (e.g., Wan Ela wewa, Janasavi wewa, Paravipaggan wewa, Janaranjana wewa).

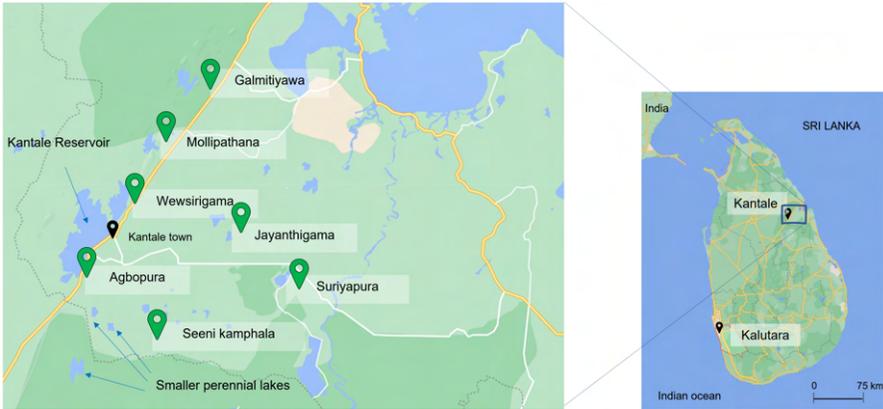


Figure 12. Study communities in Kantale. Source: Google maps

Gendered tasks and responsibilities

Unlike the coastal value chain, fishing is done by both men and women. Women's participation in the fishing, however, is shaped by the local gendered norms and expectations which restrict women's scope for participation. For example, married women we interviewed mentioned that they go fishing only with their husbands while unmarried women mentioned that they fish alone or with another woman (a relative or a neighbour).

Fish drying is generally perceived as a women-led activity. Most drying operations are organized as wife-husband teams with help from older children, parents and/or in-laws. A few processors who handle larger quantities hire part-time wage workers, who are also neighbours or relatives. Dried fish trading is also done by both women and men. However, women sell within the village and men target outside markets and handle larger quantities of dried fish.

Processing related activities and organization

The dried fish value chain in Kantale is organized as backyard community-based drying operations and dispersed across the villages surrounding the reservoir and other small lakes.

Sourcing of raw fish

Fish for drying is sourced in three main ways — fishers processing their own harvests, processors who buy raw fish at the landing, and the processors who purchase the entire fish stock in a seasonal shallow lake(s). The total amount of fish processed by each processor during each day therefore may come from Kantale reservoir and/or the small lakes in surrounding areas. The daily catch amounts processed by each processor may range from 2 to 50 kg.

a) Fishers catching and processing all or some of their own harvests

Some of the fish used for drying is caught then dried by the fishers themselves, i.e. some processors are also fishers. Fishers who do not process fish on their own sell their catches to others.

The main source of fish is Kantale reservoir,²⁵ an ancient lake built for irrigating rice lands (Figure 13). The reservoir fishery is culture-based (e.g., tilapia and carp) and harbours some wild fish varieties as well (e.g., stinging catfish, pearl spot cichlid). Fish fingerlings are stocked by the National Aquaculture Resources Development Authority (NAQDA) in collaboration with the Village Fisheries Societies. In addition, several smaller perennial and seasonal lakes in the area also provide many families with access to fishing. A few small lakes are also cultured while most smaller lakes harbour only wild fish varieties.

Fishing is done using traditional canoes called ‘Oruwa’, a non-motorized

²⁵ Kantale reservoir is an ancient lake built in 604-614 AD by King Aggabodhi II using the Mahaweli River as its main water source, the largest and longest river in Sri Lanka. The primary purpose of the reservoir is to irrigate rice lands with fishing as a supplementary activity (rice is the staple food of Sri Lanka).

DRIED FISH MATTERS

boat with an outrigger (Figure 13). Gill nets (4") are used in the reservoir and in the perennial culture-based lakes. Some fishers use a separate net with smaller mesh size (1 1/3") called 'Karawala dela or Binthul dela' to target wild varieties for drying. Each canoe typically lands about 10-15 kg of fish each day, although the catch amounts generally fluctuate seasonally and due to overfishing. Once landed, larger fish are sold to fresh fish sellers. Generally, juveniles of relatively large fish varieties (e.g., carp, stinging catfish) or smaller fish varieties (pearl spot cichlid) are used to produce dried fish. Cold storage in post-harvest handling is minimal and is limited to Styrofoam boxes that sometimes contain homemade ice. Prices vary by the size of fish (small fish vs. big fish) and not the variety.



Figure 13. Kantale reservoir and traditional fishing canoes. Credit: R. Ishan Indunil, 2021

Some processors prefer (and can afford) to buy the fish from one or more lakes rather than fishing on their own. This is because fishing involves fluctuating catch amounts as well as the hardship and risks (e.g., nets have to be set at night and fishers must spend the night on the lake to prevent theft of their nets).



Figure 14. A traditional fish landing site at the lake and cultured fish. Credit: R. I. Indunil, 2021

b) Purchasing the entire fish stock in seasonal shallow lakes

Several Village Rice Farmers' Societies, who manage smaller rain-fed lakes, sell the entire fish stock to a selected individual processor for producing dried fish. These buyers are often local people, sometimes fishers themselves. Cast nets are used to catch the fish (wild varieties) as these are shallow lakes. Daily fish catch is about 50-60 kg and the fishing takes place for about 2-4 weeks until all the fish of a large enough size for processing are caught.

17. COASTAL AND INLAND DRIED FISH VALUE CHAINS IN SRI LANKA:...



Figure 16. Sun drying on simple structures and roofing metal sheets. Credit: R. I. Indunil, 2021



Figure 17. Artisanal smoking. Credit: R. I. Indunil, 2021

Trading and distribution

Processors generally attempt to sell their dried fish stocks within a period of two weeks, as dried fish absorbs moisture from the air, especially during rainy weather. The prices are determined based on the size of the dried fish, with smaller fish fetching about CAD 2.24/kg (= LKR 350) and larger fish CAD 3.20/kg (= LKR 500).



Figure 18. A roadside stall with a sign that reads “Smoked fish freshwater dried fish available”. Credit: R. I. Indunil, 2021

Dried fish is mainly sold to collectors who visit the processors door-to-door. Some of these collectors visit from distant areas, while others are local small traders or processors who also act as collectors. Local collectors usually prepare boxes of dried fish to be loaded on the lorries that pass through Kantale and transport marine fish and marine dried fish from the northeastern coastal areas to regional wholesale produce markets (e.g., Kandy, Dambulla). A small quality of dried fish is also sold at roadside stalls. Some processors prefer to bring their products to more distant retail or wholesale

stores with which they have long-standing trade relations.



Figure 19. Salted-sun-dried fish and smoked fish. Credit: R. I. Indunil, 2021

Conclusion

This chapter explored the processing node and its linkages within both coastal and inland dried fish value chains in Sri Lanka. In doing so, we gained insights into the workings of the value chains and how embedded they are in local contexts, for example, by revealing processing methods, key activities, resource dependencies (e.g., fish, drying space, labour), and how the value chains underpin local livelihoods.

It is apparent that most processors engage in the processing node as well as fishing and trading nodes within both value chains at some level. As a result, this chapter also facilitates the development of broad insights about the entire value chain in both study locations, allowing for a high-level comparison between the two. Structurally, the two value chains demonstrate similarities as well as differences. The key similarities include the complexity

of organization within each chain, decentralized operations, and heavily overlapping nodes. Each value chain comprises a series of different channels through which dried fish move. Some channels, for example, involve wholesale dried fish shops whereas others involve processing and direct sales to consumers at roadside stalls. Both value chains also have decentralized operations, where there is no single actor such as a wholesale market or an intermediary through which dried fish is centrally distributed. As alluded to above, both value chains have heavily overlapping nodes. For example, some fishers process and sell their own catch (i.e., overlaps among fishing, processing, and trading nodes) while some processors sell directly to consumers (i.e., overlaps between processing and trading nodes).

On the other hand, the key differences between the two value chains include volumes handled and the associated complexity of activity organization within each chain, level of commercialization, and gendered tasks. In the coastal value chain, the scale of year-around production ranges from home-based operations to small and medium scale drying sites using wage labour that can handle large production volumes. However, fish drying operations comprising the inland value chain are family-run small businesses although the production volumes are much lower than the coastal one. The coastal chain is also more commercialized and profit-oriented than the inland chain, which is artisanal and supports rural livelihoods. Gendered tasks and responsibilities also vary between the two. For example, men lead activities across the coastal chain while women participate in the fish drying workforce or selling within the village. In comparison, women play vital roles across the inland value chain while leading the drying node.

Overall, the details explored through this chapter provide foundational accounts of the two study value chains encompassing the organization of activities, livelihood aspects, and place-based connections while also shedding light on areas for further research. For example, gendered value chain participation and relational underpinnings of the value chains undoubtedly emerge as stimulating areas for further investigation, among others.

References

Belton, Ben, Derek Johnson, Eric Thrift, Jonah Olsen, Mostafa Hossain, and Shakuntala Thilsted. 2022. Dried Fish at the Intersection of Food Science, Economy, and Culture: A Global survey. *Fish and Fisheries*. <https://doi.org/10.1111/faf.12664>.

Fisheries Statistics. 2019. Ministry of Fisheries and Aquaculture Resources Development, Sri Lanka 2019.

Fisheries Statistics. 2020. Ministry of Fisheries and Aquaculture Resources Development, Sri Lanka 2020.

18. Dried Small Indigenous Fish are the Pride of Assam: The Story of Suman Halдар

Adored by some and scorned by others

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Figure 1. Dried fish stall of Suman at Maligaon market, Assam. Credit: Sourabh Kumar Dubey, 2021

Fish is a dietary staple for the vast majority of inhabitants residing in the northeastern region of India. Assam is an important fish-consuming state within the eastern Himalayan ecosystem where almost all people (99 percent) eat fish. Besides fresh fish available from Assam's vast and luxuriant waterscapes, dried fish and a variety of other traditional processed fish-based products are popular among the residents of Assam. Due to the great demand for these products in the region, various dried fishes are imported from coastal states like West Bengal, Odisha, Andhra Pradesh, Tamil Nadu, and Gujarat, as well as landlocked states like Uttar Pradesh and Bihar. Apart from that, some specific dried fish and fermented fish-based products are also imported from countries like Bangladesh and Myanmar. Assam's dried fish supply chain is complex and centered on the Jagiroad market situated at Morigaon district, 50 km away from the capital city of Guwahati, which is regarded as Asia's largest dried fish market.

Suman Halder (35) has owned and operated a small dried fish retail stall along with a petty shop adjacent to the Maligaon fish market for the last two years (Figure 1). A traditional fisher by caste, Suman has lived in Assam since birth, but his ancestors originally migrated from West Bengal. Popularly known as 'Hukan Mas' in Assam, Suman refers to dried fish as 'Hutki', a name that evokes the pungent aroma that emanates while it is cooked. Suman sells more than a dozen varieties of dried fish, both of freshwater and marine origin, including Hilsa (*Tenualosa ilisha*), Gangetic hairfin anchovy (*Setipinna phasa*), Indian river shad (*Gudusia chapra*), Ribbonfish (*Trichiurus lepturus*), Bombay duck (*Harpadon nehereus*), Dhela (*Osteobrama cotio*), Mola carplet (*Amblypharyngodon mola*) and Pool barb (*Puntius sophore*). Suman gets all of his dried fish from the Jagiroad wholesale market. Suman remembers that in his village, when he was a child, a large proportion of the community were fishers and their families. He sees a great number of small indigenous fish species (SIS), not only in the markets but also in their locality every year during the months of Bhada (23rd of August to 22nd of September) and Ahin (18th of September to 18th of October). SIS such as Puthi (*P. sophore*), Moa (*A. mola*), Pavo (*Ompok pabda*), Hingara (*Mystus tengara*), Lau puthi (*O. cotio*), Koroti (*G. chapra*), Kholihona (*Trichogaster fasciata*) etc. were common in daily

meals during Suman's childhood.



Figure 2. Different types of dried Mola (Amblypharyngodon mola).

Credit: S. K. Dubey, 2021

Though 'Hukoti' and 'Namsing' are popular traditional fermented fish products in the region, Suman perceives that 'Shidol hukti' is the pride of the northeastern people. 'Shidol' is prepared exclusively from Puthi (*P. sophore*), a common SIS in this area. The procedure for making Shidol is the most cumbersome of all local preservation processes, according to Suman. Suman notes that women fisherfolk in his village sort the larger Puthi from the smaller ones; the larger ones are for the market, while the smaller ones, once sorted, are given for Shidol. For traditional Shidol preparation, after descaling, degutting and washing, the raw fresh *P. sophore* are allowed to dry partially in the sun for 4-5 days and then placed in the airtight earthen pot, locally known as Koloh or Mutkas. The round-bottomed and narrow-necked earthen pots will have previously been soaked and saturated with Puthi oil (extracted by boiling the gut, viscera etc.). The filled earthen pot is then sealed tightly with clay, creating an anaerobic environment, and left to ferment

for three to four months at ambient temperature. 'Shidol Chutney', also known as 'Shidol Bhorta', is a divine concoction of Shidol, onions, and garlic, seasoned with a liberal amount of red chili powder. It is consumed as a side dish with rice or bread.

Moa and Puthi are the most popular among the four varieties of dried SIS sold by Suman (Figures 2 and 3). Dried Puthi fetches more, at 600 Indian Rupees (INR) per kg, while Moa sells for 500 INR per kg in the Maligaon market. "*1 kilogram of raw SIS like Moa, Puthi, Lau puthi become 300-400 grams after drying*", Suman added. The winter season lasts from October to mid-March and is the most preferred time for dried fish consumers from the Assamese and Bengali communities. The demand for dried SIS peaks from December to February. "*Assam is a genuine treasure trove of open-water ecosystems, with beels (a natural low-lying wetland formed mainly due to meandering action of rivers) and rivers providing the bulk of Moa and Puthi for the dried fish business*", Suman proudly told us. Along with dried SIS, the demand for 'Loitta or Bomla hutki' (dried Bombay duck) and 'Nona Ilish' (dried and salted Hilsa) is also high across Assam (Figure 4). During the summer season, dried Moa is marketed but Puthi is not. Still, the demand for 'Shidol Puthi' remains high throughout the year and fetching 1,000 INR per kilogram. Dried Moa and Puthi are consumed with mixed vegetable curry and are also used to make the mustiest mouthwatering chutney. Suman related the interesting fact that, during the off-season, dried small fish are often purchased by the customers for their pet cats.



Figure 3. Dried Puthi (*Puntius sophore*) and Lau puthi (*Osteobrama cotio*). Credit: S. K. Dubey, 2021

Suman believes that, although few adore it, and many despise it, eating dry fish, particularly SIS, keeps the body warm throughout the winter, enhances immunity, and protects against diseases such as typhoid and malaria. It also appeals to children since it contains few soft bones. Suman sells dried fish from his small kiosk for 18,000 to 20,000 INR per month during peak season, but his sales drop to 5,000 to 8,000 INR during the summer season. In the last two years, he experienced 30-35 percent profit from his total sales. His major concerns are storage and weight reduction of dried fish during the summer season. Suman intends to start a wholesale dried fish business in the future centering on the Maligaon fish market.

The north-eastern region of India is a kaleidoscope of cultural and social assimilation and the Indigenous ethnic communities of this region have cultivated rich Indigenous knowledge systems connected to fishing and ethnic fish-based food products. “Dried indigenous small fishes have a bright future in the context of Assam”, Suman added. He believes that aquaculture production of SIS such as Puthi, Moa, Lau puthi, Koroti, and Hingara will enhance availability, affordability, and consumption of dried SIS while also

18. DRIED SMALL INDIGENOUS FISH ARE THE PRIDE OF ASSAM: THE...

reducing the impact on the natural aquatic ecosystems. Besides incentivizing the small dried fish retailers through various fiscal programs, Suman urged that the government should place a greater emphasis on the protection and conservation of numerous small fishes and their habitat which are becoming threatened as a result of various human-induced interventions.



Figure 4. 'Nona Ilish' (dried and salted Hilsa) is most famous in Assam. Credit: S. K. Dubey, 2021

19. Shopping for Dried Fish: A Photo Essay Portraying the Varieties of Dried Fish Products in Thailand

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Summary

Fish is an unassuming food for the Thais. Fish, whether fresh, cooked, dried or in other preserved forms, is easy to find in local, open-air markets, supermarkets, and convenience stores. The varieties of fish products, especially dried fish, are impressive, and overwhelming to document. Dried squids and dried anchovies, for instance, are made into numerous textures and flavours, with the latter being promoted as healthy food, especially when mixed with sesame seeds, herbs, and spices. Through this photo essay, we present a range of dried fish products commonly found in markets in Thailand, not only as a glimpse into the diverse culinary dried fish scene, but also as an illustration of the challenges in dried fish research.

Fish – an unassuming food

Fish is an unassuming food for the Thais. Fish, whether fresh, cooked, dried or in other preserved forms, is easy to find in local, open-air markets, supermarkets, and convenience stores. Thai people grow up eating a large variety of freshwater and marine fish in various dishes, prepared in numerous ways, cooked at home, bought from food stalls, or in restaurants. Fish is a staple food for the rich and the poor alike. Not too many people would pause and ask questions about fish, what it is, where it is from or how it is processed in the case of dried fish. All they know is that they can always get fish. From the consumer's perspective, this is certainly a good thing. Unless one is very particular about certain fish, there are many substitutes. This is also the case with most of the dried fish products, since there are several types to choose from and the varieties of dried fish that one can buy are truly impressive.

Fish is also easy to buy and many people have favourite shopping locations. Fresh fish is available in local, open-air markets in districts and villages across the country, as well as in grocery stores and supermarkets in the cities. Uncooked dried fish is not as readily available in local markets; one needs to know where to go to buy it. But cooked, ready-to-eat, flavoured dried fish is popping up in convenience stores, flea markets, and groceries. Dried fish, in particular, is becoming a major product for online marketing and e-commerce, with increasing popularity since the COVID-19 pandemic.

The varieties of dried fish products in Thailand, while impressive, are rather overwhelming, especially from a research perspective. Dried squids and dried anchovies, for instance, are made into numerous textures and flavours, with the latter being promoted as healthy food, especially when mixed with sesame seeds, herbs, and spices. There are also seasonal varieties and fluctuation in demand due to cultural celebrations. Dried squid is a good example. It is in high demand during the Chinese New Year and the price of dried squid is particularly high during this period.

In our effort to learn as much as we could about the dried fish products in Thailand, we visited key wholesale and retailed markets in and around Bangkok, and in key fisheries provinces. We made use of photographs that we

took of the products to illustrate the varieties. While this survey of products does not represent a complete inventory, it offers a good glimpse of what is being sold in different types of markets and reveals some important patterns and trends that can be further investigated.

Wholesale/retail dried fish markets

There are three main wholesale/retail dried fish markets in and near Bangkok: Talad Mahachai in Samut Sakhon Province, ‘Talad Si Moom Mueng’ in Pathumthani Province, and Talad Tha Tien in the heart of Bangkok. Note that the word ‘Talad’ means market in Thai, and the three markets are referred to in the report using the Thai name.

1) Talad Mahachai

Talad Mahachai is popular and well-known among the Thais for fish and seafood products, both fresh and dried. It is situated about 50 km southwest of Bangkok, on the Tha Chin River, near its estuary at the upper Gulf of Thailand. Its proximity to the sea gives an impression of guaranteed freshness of seafood to consumers. It is also the largest dried fish wholesale and retailed market in Thailand, having close to 40 vendors, selling a large variety of dried fish products. As we learned from our initial scoping study, these dried fish vendors have been operating at the market on average for about 13 years. These vendors are independent operators, not belonging to any association, and are similar in the type and the prices of products that they sell. Almost all the vendors are local (from the province) and about a quarter of them operate as family-run, small business enterprises. The most common dried fish products sold by all vendors in this market are dried fish (anchovies and others), Kapi (cooking paste made from *Acetes* shrimp), dried squid, and dried shrimp. The varieties and quantities of products sold vary between vendors, but none of the vendors specializes in certain dried fish products.

19. SHOPPING FOR DRIED FISH: A PHOTO ESSAY PORTRAYING THE...

Those looking for something specific, can ask the vendor, and negotiate the prices.

Certain products are labeled with the name, in this case, giant sea catfish, to differentiate the product from a cheaper version.



Store name "Sang Thai" with vendor number showing the organization of the market.

Women are involved in dried fish marketing (a shop owner - back to the camera - and a helper).

Many shops don't just sell dried fish but other favorites like these palm sugar candies.

Some products are already weighed and packed, with prices, for convenience to both sellers and customers.

Figure 1. A typical dried fish shop. Credit: Ratana Chuenpagdee, Talad Mahachai, April 2020

Some of the vendors processed their own dried fish but the majority indicated that they sourced the products locally, from nearby processors in the province. A few of them sourced the products from other provinces such as Petchburi and Prachubkirikhan, further to the south. When visiting this market, one cannot help but appreciate how important dried fish is to both the vendors and the buyers.

2) Talad Simummuang (Four Corners Market)

Bangkok used to be the center for the trading of goods and products from across the country, with collectors and traders transporting items to wholesale and retail markets for further distribution. Over the time, Bangkok became too congested due to rapid growth and limited urban planning; thus it was no longer convenient to serve as a market and trading

center. In 1981, Talad Si Moom Mueng was established under the Fifth National Economic and Social Development Plan to serve as a new center for trading of all agricultural products from ‘four corners’ of the countries, as per its name. Situated in Pathumthani Province about 25 km north of Bangkok, the market is the largest agricultural distribution centre in Thailand, open 24/7 and covering an area of 350 rais (about 56 hectares). While the majority of the products sold and trade are fresh, there are a couple of dried fish vendors selling all types of products, similar to Talad Mahachai.

One female vendor, Khun A,²⁶ the owner of the largest dried fish store in the market, offered some information about her business, which began 30 years ago. She buys numerous types of dried fish products, mainly from the other two wholesale markets (Talad Mahachi and Talad Tha Tien). Her buyers are retailers, restaurant and hotel operators, schools, a military base, and prisons. She does not offer delivery service or credit to customers. Thus, buyers come to the store to pick up their order and pay in cash. She was interested in online marketing and e-commerce during the COVID-19 pandemic, but didn’t find it cost effective due to a high level of competition. Storefront transactions are therefore her mainstay. In addition to herself, she has one helper who she hires on a monthly basis. Khun A has a refrigerator at home to store products to maintain their freshness. According to her, the challenges in her business are related mostly to the rising cost of the products, uncertainty in the product availability, and transportation issues (congestion and unreliability). Khun A hopes that her children will take over her dried fish business one day considering what it has provided for them. She sees flexibility and adaptability in how to run the business, which should make it more appealing for her children. Our conversation with Khun A clearly indicated that business innovation is going to be a very important aspect of the dried fish value chain.

²⁶ A pseudo name; ‘Khun’ is a polite prefix to refer to a person. Thai people also use ‘nicknames’ to refer to each other. ‘A’ is one of the common names.



Khun A's shop is easy to find in Talad Simoommuang since it is the largest store selling dried fish. One cannot avoid feeling overwhelmed when walking around the store, looking at it from all sides, and seeing what it has to offer. And don't forget to look up as some of the products are hanging from the rail.

Figure 2. Khun A's shop in Talad Simoommuang. Credit: Kongpop Rungruengrayap, April 2021

3) Talad Tha Tien

This market was a surprise and a delightful find. It is not as well-known among consumers, but many dried fish vendors have mentioned it as one of the main wholesale markets where they buy fish for their store. The first surprise element of this market is its location. The market is situated in the historical district of Bangkok, near touristic landmarks like the Grand Palace and the Chao Phraya River. Once the biggest trading center in the 17th-18th centuries, Talad Tha Tien retains its main function today as a key trading hub for dried fish products.

DRIED FISH MATTERS

Unlike the modern markets, it feels like being transported back through time when walking into Talad Tha Tian. The market is built in a U-shape, with wooden structure and frame. The interior of the market is dim, as it relies mostly on natural light.



The products are displayed in traditional containers, like bowls, paper boxes and sacks. Shop owners are friendly and are willing to chat, probably because the market is in the tourist area.

Figure 3. The charming Talad Tha Tien. Credit: K. Rungruengrayap, February 2021

There were four dried fish vendors operating in the market on the day of our visit (February 2021). According to them, the number of vendors had gone down in the years prior to the COVID-19 pandemic, but the travel restrictions had made things worse for the markets due to the lack of tourists. Regular customers continue to shop at the market, however, keeping these traditional vendors going. One vendor is 78-year-old lady, who said that she started working in the shop, which is a family-owned business, at the age of 17. The other vendor said she is the fourth generation running the shop, which has existed as a family business for 50 years. Similarly, two other shops are family-run and have respectively been in operation for 30 and 40 years. All are hoping that their children or grandchildren will take over their business when they retire. For now, they rely on hired labourers (mostly foreign workers from neighbouring countries) to help in the shop. Perhaps it should not be a surprise that the occupants of this old market would have a rich history and background.

Dried fish sold at this market are from Talad Mahachai and other coastal provinces, like Samut Sakhon, Chonburi, and Rayong, as well as from the south. One of the vendors said that she goes to the provinces and buy the products herself, after tasting and selecting products she likes. The shop owners mentioned that in addition to their regular customers, including tourists, retailers, and hotel, and restaurant owners, they also sell to supermarkets. They offer delivery services (by post and courier) for large orders. All four vendors talked about the high cost of fish and competition with other vendors, including large-scale supermarkets, as key challenges.

Dried fish in local markets

The importance of fish in the Thai people's diet means that fresh and dried fish are readily available in all provinces across the country. One of the cultural symbols in Thailand is a local market as a place for people to buy produce, dried goods, and other necessities. Even though air-conditioned convenience stores and supermarkets are attractive options, local people rely on open-air market for their staples, as well as for the interactions with people they know. Shop owners and customers are often familiar with each other and going to the market means updating each other on family news and current affairs. Another key aspect about the local market is that prices are negotiable. Negotiating price is thus another social skill that Thai people develop as part of their market visits.

Some of the local markets are organized and managed by the municipality, while some are run by private market associations. In either case, vendors pay a small fee to maintain stalls in the market. These markets vary in terms of size, but carry similar items, from fresh fruit and vegetables to meat, fish and seafood. There are normally a couple of shops selling dried fish products, among other dried goods. Markets in touristic areas often have shops that sell pre-packaged, popular dried fish items to visitors.

The best place to learn about dried fish in each province is therefore a local market. This is what we did during our field research in March 2021, which revealed that dried fish shops in the local markets in the coastal provinces

share many characteristics in common. What may vary are the sources of dried fish products, although some common locations have been identified. Below is an example of what we learned from a conversation with a male dried fish shop owner in Trang Province, southern Thailand.

Khun B's dried fish shop has a nice array of products. Khun B talked about each of them proudly, indicating where they are from. He started with a popular item, small anchovies (local name: Pla Jing Jung), which are seasonally available. During the first half of the year, he buys them from the Andaman Sea provinces, but between April to October, they are available from Songkhla Province on the Gulf of Thailand. His dried squid is from Japan, as it is lighter in colour and more desirable to consumers; thus he can sell it at a higher price than local squid. Yet, the best squid is that which has been captured using a squid falling net (with light luring device), and dried onboard immediately after capture. Another best-seller is dried shrimp, which fetches a high price of about 800 Baht/kg (about CAD30). He sourced them from the lower south provinces, e.g., Songkhla, Pattani, and Satun. Khun B was proud of his dried shrimp, noting that they are top quality, not salty, and are much cheaper than those sold in Chinatown in Bangkok (1,200-1,500 Baht/kg or around CAD 50). Finally, he showed three different presentations of Kapi: in pre-packaged jars, as a block sold by weight, or as a big round ball also sold by weight. The jarred Kapi is from Trang Province, while the others are from Satun.

Prior to becoming a dried fish vendor, Khun B worked as an employee for a company in Bangkok for about 20 years. He did not enjoy Bangkok life all that much and was tired of the busy and congested city. He moved to Trang Province to help his wife with the dried fish shop and found his quality of life to be greatly improved. He is in charge of opening the shop at 6 AM and works until 11 AM, when an employee comes in to take care of the shop. He returns to the shop in the evening to collect the money and close the shop. His business philosophy is fairness and honesty.

The way Khun B talked about his shop reveals how much he enjoys his work, especially the freedom that the fish selling livelihood offers him. It also speaks well of the importance of knowing where the dried fish is from and

the quality that he can trust, and how he takes great pride in that knowledge.



A vendor in the main market in the city of Songkhla, talking about her products.



Pre-packed dried fish products are offered in a souvenir store in Rayong Province.



A visit to the dried fish store in the market means getting other ingredients for cooking.



Conducting research during the COVID-19 pandemic is not as easy but can be done under a proper protocol.

Figure 4. Many dried fish products can be found in any local market. Credit: top-left R. Chuenpagdee, August 2019; top-right K. Rungruengrayap, February 2021, and bottom S. Traesupap, March 2021

Dried fish in grocery/convenience stores

Dried fish sold in the markets is mostly uncooked while products in the groceries and convenience stores and supermarkets is sold as 'ready-to-eat' snacks. We visited a couple of key large chain stores in Bangkok, one serving high-end customers and ex-pats while the other targets lower-end customers in suburban areas. In both cases, a large variety of dried fish products is offered with the products coming from various locations in Thailand. The main differences between the products sold in these stores are the packaging and the prices. As shown in Figure 5, the packaged dried fish in high-end

DRIED FISH MATTERS

markets like Tops is attractive and includes information in English. These products contain labels showing the ingredients, nutritional value, and an indication that they meet the required health and safety food standards. Dried fish products in the low-end store, on the other hand, are sold in less attractive packages, often without a label and at lower prices.



*Figure 5. Comparison of dried fish products in the high-end vs. low-end markets.
Credit: K. Rungruengrayap, May 2019*

Closing thoughts

As consumers, shopping for dried fish can be fun and exciting. Dried fish is readily available at affordable prices, both as uncooked and ready-to-eat products. For researchers studying dried fish, appraising what products

19. SHOPPING FOR DRIED FISH: A PHOTO ESSAY PORTRAYING THE...

are offered in different types of markets alone is an exciting but exhausting exercise. A rapid scan of markets, coupled with initial visits as performed and reported here, is helpful in narrowing the scope of the study. It also came to our attention during this preliminary scoping research that many dried fish products are sold online through e-commerce (see Figure 6). For the in-depth value chain study, we ruled out ‘cooked’ products since these are too numerous, but will be investigating them as part of a study about emerging online marketing and e-commerce and the role it plays on the local economy and the nutritional food security, especially of the people in upland areas.



Figure 6. Many vendors are engaging in online marketing and e-commerce of dried fish products. Credit: R. Chuenpagdee, August 2020

20. Living on the Edge: Experiences of Women Fish Processors and Traders in Coastal Northern Andhra Pradesh, India

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Abridged by **Madu Galappaththi**, University of Waterloo, Canada

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Traditionally, dried fish processing and trade in coastal Andhra Pradesh, India, have been associated almost exclusively with women, although some men also participate in these activities. In fact, about 95 percent of fish processors are women, who continue to make a living by participating in dried fish activities while also contributing to an important strand within the local fishing economy (Figure 1).

While fish trade, both fresh and dried, was once considered primarily the domain of single, poor and/or aged women, nowadays a few married women have also begun participating in these activities. This reportedly became necessary on account of the declining income from fishing that their

menfolk bring home. Another important factor is the migration of men from the coastal fishing villages to distant places like Chennai, Gujarat, and Goa, leaving their families behind. As the monthly remittances from the men tend to be intermittent and irregular, and frequently insufficient to meet family needs, the burden of running the family falls upon the shoulders of women who, being closest to the sea and the fish, take up the fish business as their first choice.



Figure 1. Women sun drying fish near to the market. Credit: District Fishermen Youth Welfare Association, 2021

In Northern Andhra Pradesh, fishing and related activities, including dried fish processing, have largely remained in the hands of traditional fishing castes such as Vadabaliyas, Jalaris, and Agnikula Kshatriyas (the latter also known as Palles). Once the fish moves beyond fishing villages or where ancillary activities like basket weaving are concerned, the actors tend to belong to other castes and communities. However, the actual process of dried fish making is a caste-fishers' occupation. Some labourers may occasionally be recruited from the neighbouring agrarian communities although such instances are rare. In comparison, fresh fish trade reportedly attracts more women from non-fishing castes or inland fishing castes (e.g., Nyla, Eeta, Yadava); however,

they tend to buy their fish at the fishing harbours, not the traditional landing centres.

The typical age of these women ranges from 40 to 65 years. Although the women involved in dried fish processing generally have low literacy levels or are even illiterate, they are exceptionally good at working with numbers and can manage all aspects of their businesses: procurements, supplies, transactions, margins, and the like.

The strong demand for dried fish from the traditional markets in interior and upland communities within the state as well as the inter-state markets (e.g., Kerala, Odisha) is a key factor that has kept most processors in business. Both the regular dried fish markets and the weekly wholesale fish markets are dominated by women although the long-distance distribution is handled by men, owing to the practical difficulties for women to travel long distances (Figure 2). Dried fish activities thus reinforce the traditional gender-based division of labour within fishing communities. Women who engage in fresh fish selling in neighbouring villages can simultaneously undertake dried fish processing and trading while conforming to the prevailing social and cultural arrangements.



Figure 2. A woman dried fish seller at the market. Credit: District Fishermen Youth Welfare Association, 2021

This chapter outlines the work routines, working conditions, and livelihood context of women in northern coastal Andhra Pradesh whose livelihoods comprise small-scale fish processing (i.e., salting, sun-drying and smoking) and trading. Depicted in Table 1 below is the regular work routine of one such woman whose livelihood involves a four-day cycle, from fish buying to processing and selling in the weekly fish market. On the remaining days of the week, she may sell dried fish door-to-door in towns and villages within a 50-100 km radius. Similarly, the workday for many women starts at dawn and involves continuous work until past midnight on most days, handling both work and domestic chores without a break. As the fish landing centres and the markets move farther away, so does the need for women to spend longer hours traveling. Challenges related to their ability to sell all the fish during each visit and the timely availability of transport or other circumstances could prolong their daily work hours.

DRIED FISH MATTERS

Table 1. Work routine of fish drying and selling women in Pudimadaka

Activity	Start time	End time	Time in hours
Day 1: Fish procurement and preparation			
Travel: Pudimadaka-Visakhapatnam fish harbour (65km) by autorickshaw for fish purchase	3:00	5:00	2
Fish procurement, packing and loading	5:00	8:00	3
Return: fishing harbour to Pudimadaka (heavy traffic)	8:00	11:00	3
Household work (cooking, water collection, washing)	11:00	13:00	2
Preparing fish for drying: removal of scales, gills, gut; washing; salting, and curing	13:00	17:00	4
Wash and rest	17:00	18:00	1
Household work (cooking, etc.)	18:00	20:00	2
Sleeping	22:00	2:00	4
Travel: Pudimadaka-Vizag fishing harbour for collection of fish	3:00	5:00	2
Day 2: Fish processing			
Domestic chores (cooking, readying children for school, groceries, water etc.)	5:00	7:00	2
Removal of fish from the vats, washing, and spreading out to dry	7:00	10:00	3
Fish drying: turning the fish over, keeping guard, preparing fresh batches of fish for curing/drying	10:00	17:00	7
Collection of semi-dried fish in heaps and covering with tarpaulin/plastic sheets	17:00	18:00	1
Household work	18:00	20:00	2
Day 3 & 4: Sale at weekly fish market			
Drying of fish completed (turning fish, removing damaged/broken fish, pooling catches)	8:00	12:00	4
Household work	12:00	14:00	2
Packing dried fish according to species and quality in gunny bags	14:00	18:00	4
Travel to Nakkapalli Friday weekly dried fish market by van	1:00	3:00	2
Fish sales	3:00	6:00	3
Collection of payments, making purchases for household work	6:00	8:00	2
Travel back to Pudimadaka	8:00	10:00	2

These long working hours are compounded by harsh working conditions, with the processors always being in a rush and under considerable strain. As they keep running around to buy fish and arrange for its transport, they hardly get the time for even a quick bite; many forego that 'luxury' in order to save the money, settling for a cup of tea instead. They also avoid drinking water and other liquids, despite spending hours under the scorching sun, for a more sensitive reason, specifically the lack of easy access to safe toilets.

The trouble women have with a lack of access to toilets is not confined to their fish procurement areas and the markets alone. Even in their own

villages, sanitation facilities are a major concern. For the women in several fishing villages, the single most important necessity is the construction of safe toilets in the absence of which they suffer untold miseries. Open defecation, usually confined to early or late hours in the day, is not only physically uncomfortable but also unsafe; increasingly, as new developments encroach upon the common areas, the women lose both space and privacy. Community toilets tend to be built too far away from the habitations, are poorly managed and maintained, and generally not used.

A fish processor's days are as hectic as they are tedious, and even as she is busy running to buy or sell fish, there are long waiting periods that punctuate her working day which are tedious and unproductive. For instance, her workday includes long waiting periods until boats land or transportation vehicles arrive and waiting until fish is being dried or sold at the markets, during which she can neither relax nor do anything productive (Figure 3). Since she fully concentrates on ensuring her supplies or sale of fish, and on obtaining a decent margin on the money she has invested, a woman's time investments become secondary or completely overlooked in her calculations. At the same time, there are real implications in terms of women's health.

DRIED FISH MATTERS



Figure 3. A dried fish market in Northern Andhra Pradesh. Credit: District Fishermen Youth Welfare Association, 2021

A woman's working hours are also unpredictable and depend on such irregular variables as the arrival of catches, the woman's ability to buy and sell quickly, and finding transport on time. Depending on her success in procuring/selling her fish, a woman's working day could stretch for a long time, causing immediate problems such as fatigue and weakness, and deeper concerns relating to her safety and security, as well as social opprobrium. Door-to-door sales of fish also present several uniquely difficult problems, including health issues (e.g., carrying heavy weights on the head, dehydration, lack of easy access to toilets, and no fixed meal times). Still, without any alternatives, the women simply must do it.

Back in their villages, they must prepare each batch of fish for drying, then

wash and salt it, and later spread it out in the open for drying (Figure 4). They have to stand guard over the drying fish, protecting them from the weather, animals and poachers, and turning them from time to time to ensure uniform drying. All such activities require long and backbreaking work and take place under the harsh glare of the sun relentlessly beating down on them, which, as a woman processor puts it, “*is better than having rain, which means a total loss*”. Whereas earlier fish processing used to be a family-based enterprise involving several women, today the women must work alone or employ wage labourers, as joint/large families have given way to nuclear/small families.

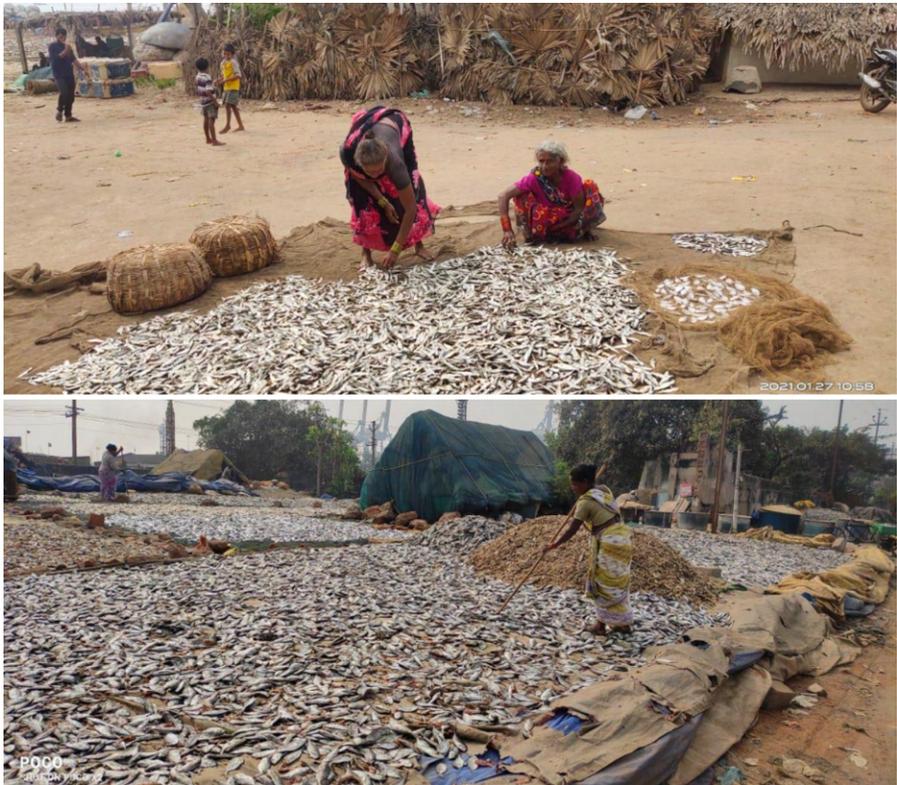


Figure 4. Women sun drying fish within fishing communities. Credit: District Fishermen Youth Welfare Association, 2021

The average age of a women fish processors (40 – 65 years) has a significant implication on the long-term sustainability of the activity. Women over 65 are often too weak to carry on with the hard and strenuous work of fish drying. However, it is the absence of people under 40 which indicated that younger people are not interested in entering this business, partly due to the hardship involved. Most current processors have reported that they entered the business around the age of 12, when they started by helping their mothers in the activity and became more involved in the business after their marriage, around the age of 14 to 16. The younger generation are unwilling to get involved in the traditional businesses, one of the reasons for their reluctance being the difficulties involved in the operation.

Children's role in the family has changed in several ways, the most important being that most children now go to school for a period ranging from a few years to until the end of their local studies, sometimes longer. One consequence of the rising educational standards has been that youth view dried fish processing (and fishing itself) as a low-status activity and aspire to other professions, as there are few hopeful signs that the dried fish business will yet become a profitable sector. Hence, their unwillingness to join their parents in the business is not without foundation. What it does imply is that fresh recruitment into the ranks of dried fish processors has dried up, exacerbated further by the desertion of fish drying by a number of women who prefer fresh fish vending instead.

Although fish smoking is a marginal activity undertaken only in certain pockets of northern coastal Andhra Pradesh, the working conditions of the women engaged in the activity may have a detrimental effect on their health. This is because a large part of their day is spent exposed to continuous smoke in enclosed surroundings as the fish are arranged on bamboo platforms with a fire underneath, emitting mostly smoke. The heat and smoke lead to all sorts of health complications for the women, who must also turn the fish over at regular intervals in the hot chamber.

Lack of space, poor services, and heavy workload have an impact on the health of the women, many of whom suffer from a number of occupational health problems, including sleep deprivation, hypertension and anxiety,

dehydration, and restlessness. With no healthcare systems to diagnose and extend support to the women, they rarely go to the hospital for treatment. As well as the cost of the consultation and medicines, they fear the loss of working time, which they cannot afford.

As the women processors explained, improving the economic efficiencies in fish drying might be a priority (e.g., reducing losses, value addition, and higher prices), but they have more pressing concerns. They can improve their practices by themselves if they are taught how (e.g., better moisture control during drying, adequate levels of ice usage for fish). What is more important for them is to make efforts aimed at optimising their daily workload so they can get a few extra hours of rest and work in less strenuous conditions. The occupational health issues of the fisherwomen processors have so far received little attention or, as one processor put it, *“We have been taught more about how we can keep our fish looking well than about keeping ourselves healthy.”*

In remote landing centres in Srikakulam district, fish are sold on a credit basis, allowing the women to process the fish and sell it first before paying back the pre-agreed price to the fishers. This flexibility in payment allows the women to buy almost any quantity of fish that is landed (and gives assurance to the fishers that they could sell any amount of catch they may land), although the women frequently complain about having made a loss at the market but still being forced to pay the fishers as per the agreement. In the urban and rural landing centres (Figure 5), where women must pay cash immediately upon purchasing their supplies, it is easier to get a handle on their investments, though it remains difficult to assess the varieties and quantities of fish purchased or the eventual earnings from the investment. The nature of the system demands that the markets operate flexibly, which means that there are few standards when it comes to pricing and payments. Thus, a woman processor was able to procure almost 240 kg of fresh fish from Visakhapatnam fishing harbour for a total investment of Rs. 15,000 on one day and the same woman could hardly manage to buy 170 kg of supplies (of a similar composition as the previous week) for the same investment a week later. Interestingly, in both cases, she earned roughly the same amount of money.



Figure 5. A fish landing site. Credit: District Fishermen Youth Welfare Association, 2021

The interactions with the dried fish processors in groups and individually indicate that their incomes are probably higher than those working as agricultural labourers, which is the one non-fisheries-related activity that most women often move into. The processors compare their higher earnings against two additional factors: greater workload (requiring up to 10-14 working hours a day) and higher financial risk (there are as many cases where the women made a loss as there are when they made a profit). The issue of risk in fish business, a subject that has never really been studied to any great depth in relation to small-scale fish marketing, is of no significance in the case of dried fish processors.

As far as earnings are concerned, the women's contention is that while the market prices have been adequately compensating for declining production, it is just enough to help the women to fill the gap in the men's earnings at home and keep up with the new needs such as the children's education. In other words, their earnings allow the women to keep afloat while not exactly giving them enough either to save or to invest in their businesses, let alone in new enterprises.

Although a woman practically manages the household and keeps it running day in and day out, she remains subject to societal and cultural inhibitions

and constraints in the village: her ability to travel independently and to spend long enough time at a supply centre or at a market to get the best bargains is constrained by propriety norms. Even as the woman must spend long, uncomfortable nights at fish landing centres and at markets in order to pay for her family's subsistence, she must make sure that she is not overstepping her freedom. Her business might require extended stays and uncertain hours, but the women cannot afford to spend the extra time without drawing attention to themselves, especially if they are young.

Within the village, the women's role in the decision-making processes has improved over the years, but it is still not proportionate to her other role as an important income earner in the family. Even in the meetings to discuss the dried fish trade, men would chip in with their own take on the issue under discussion, lightly dismissing the woman's point by saying, "*She doesn't know.*"

21. Dried Fish Consumption in Myanmar

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Introduction

Dried fish – fish, shrimp, and other aquatic animals that have been processed using simple techniques including sun-drying, salting, fermentation, and smoking to allow them to be stored as food at room temperature for extended periods of time – are a central part of the diet and cuisine throughout much of Myanmar.

For example, in the Dry Zone of central Myanmar, the typical meal of a farming household is a big portion of rice with chickpeas and fish paste, in some cases, together with vegetables. This meal is consumed at least twice per day. Dried fish is also eaten in small portions on an almost daily basis. In contrast, meat is usually consumed 1-3 days a week, and in small portions (Antonio 2015).

Based on analysis of a nationally representative household survey, Belton et al. (2015) reported that 97 percent of households consumed fish products within the past seven days while around 90 percent reported having consumed meat. Fish account for 50 percent of animal source foods consumed nationally

while dried fish products account for 34 percent of all fish consumed in Myanmar (Belton et al. 2015). However, despite their evident importance as a source of human nutrition and cultural value, there have been no dedicated studies of dried fish consumption in Myanmar to date, and the range of products and consumption practices and patterns thus remain poorly understood.

To address this gap the Network Activities Group (NAG), a national NGO in Myanmar, conducted a study of dried fish consumption in Myanmar between October 2019 and March 2020. We anticipated that dried fish consumption patterns would vary across the country in terms of quantity, frequency of consumption and types of products, in line with local variations in supply and cuisines. The survey was therefore implemented in eight states and regions where NAG offices are located, to allow for comparisons between geographical zones.

Participants in the study were rural people living in villages served by NAG projects. NAG field staff were trained to collect data on fish consumption in the seven days prior to the survey, using a simple questionnaire.

Respondents were asked whether members of their household had consumed any fresh fish or any of several categories of processed fish products during the past week. When respondents confirmed that they had consumed any category of processed fish product, they were asked to identify the product/s from a prepopulated list or to give the details of any products not included in the list. Respondents were asked to identify the origin (freshwater or marine) and the specific fish species used to make any of the products consumed. Information was elicited on the quantity and price of the products consumed, and how and where they were sourced (e.g., from own production, markets). A total of 960 respondents were interviewed. Figure 1 summarizes the survey locations in Myanmar where consumers were interviewed.

The study areas cover the three geographical zones of Myanmar: the Delta and Coastal Region, the Dry Zone, and the Hill areas. The Delta and Coastal Region includes Ayeyarwady, Yangon and Bago regions and Mon State. Ayeyarwady, Yangon and Bago are part of the Ayeyarwady Delta, which is a major site for freshwater capture fisheries. All four of these regions/states

have a coastline, and Ayeyarwady and Mon are major producers of marine capture fish. Mandalay and Sagaing Regions are in the semi-arid Dry Zone in the center of Myanmar, along the middle course of the Ayeyarwady River, an area with rather limited fisheries resources. Northern Shan and Kayin States are in the Hills in the Northeast and East of Myanmar, respectively. Kayin has more abundant freshwater fisheries resources than Northern Shan.

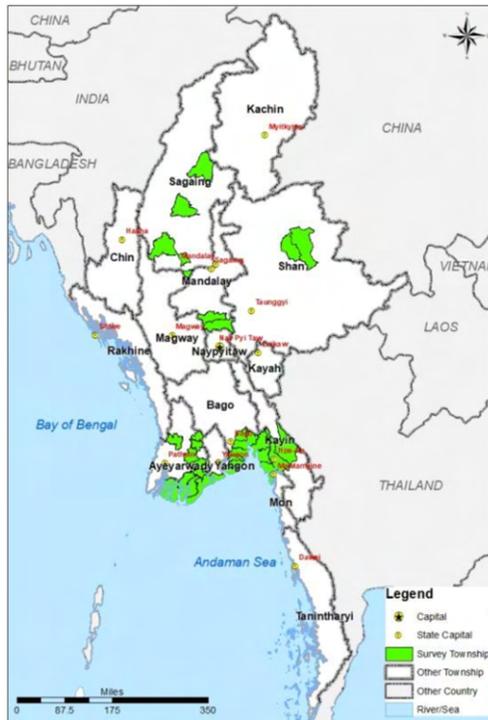


Figure 1. Surveyed townships map. Source: Authors

Types of processed fish products

In this section we briefly describe and illustrate the different types of processed fish products consumed in Myanmar.

Dried fish (Nga-chauk)

Dried fish (*Nga-chauk*) is a staple food for all people in Myanmar, regardless of their socioeconomic status. There are many quality grades and methods of processing that vary by region and season. In most cases fish is cleaned and salted before being left overnight. Salted fish is sometimes washed with water before drying. Marine and freshwater fish of all sizes is dried. Some of the most common types of dried fish consumed originate from marine fisheries; however, snakehead, a common freshwater fish, is one of the most preferred dried fish.

A variety of methods of cooking and preparation are used depending on the type of dried fish eaten. Some are eaten with peanut oil, some are fried or cooked, and some are used as a seasoning. Dried snakehead (*Nga-yant-chauk*) is mostly grilled and prepared to be eaten with peanut oil only. It is also cooked with vegetables as a curry. *Ba-la-chaung* (deep fried dried fish or shrimp with onion, garlic, and chilies) is a common quick side dish that can be stored for a long time (Figure 2).



Figure 2. (Top Left) Homemade brackish water dried fish for subsistence

consumption, Ayeyarwady; (Top Center) Drying snakehead for subsistence consumption, Yangon; (Top Right) Dried large pelagic marine fish species in a market, Ayeyarwady; (Bottom Left) Retailer selling dried fish in Ayeyarwady Region - Bombay duck on the right, anchovy in center; (Bottom Center) Ready-made dried fish and shrimp condiments on sale at a supermarket in Yangon. (Bottom Right) Dried shrimp salad and dried Bombay duck fish as a snack to be consumed with green tea, Ayeyarwady. Credit: Ben Belton, 2015-2019

Dried shrimp (Pa-zun-chauk)

While dried fish is a main ingredient in Myanmar cuisine, dried shrimp is also used as a seasoning ingredient or taste enhancer in preparing salads, side dishes, soup, and curries. Dried shrimp (*Pa-zun-chauk*) varies in size, drying method, season, and region. It may be purchased and used in powder form or as whole dried shrimp (Figure 3).



Figure 3. (Left) Small packs of dried shrimp for sale in a wet market at an affordable price; (Right) Large selection of dried shrimp products for sale at a retail market in Yangon. Credit: B. Belton, 2014 & 2018

Smoked fish (Nga-jat-taik)

Smoked fish (*Nga-jat-taik*) is normally made using freshwater fish. Traditionally, smoked fish was produced in upland areas of Myanmar (Shan, Chin and Kachin) as a way of preserving small indigenous species of fish (SIS) harvested from the wild. In more recent years, farmed fish, particularly, small-sized rohu, is smoked commercially and marketed in the hilly regions in Western Myanmar (Figure 4).

DRIED FISH MATTERS



Figure 4. (Top Left) A retailer selling smoked freshwater small fish in Kalay market, Sagaing; (Top Right) Smoked farmed rohu in storage in Kalay, Sagaing Region. Credit: Wae Win Khaing, 2019; (Bottom) Homemade traditionally smoked featherback, Kayah State. Credit: B. Belton, 2018

Fish or shrimp paste (Nga-pi) and fish sauce (Ngan-pyar-yay)

Fish or shrimp paste (*Nga-pi*) is the most common fermented product. It has a pungent smell and is considered a source of national pride. Fish paste can be made either from freshwater or marine fish, whereas shrimp paste is always made with marine small shrimp species, and the product is called *myin-nga-pi* (Figure 5).

In the most common process of fish paste fermentation, fish is digested so that the form of the fish is no longer discernible. Fish paste is typically made from small fish. Some are used whole, and others are de-headed. Long whiskered catfish (*Nga-zin-yine* or *Mystus gulio*), a small catfish found mainly in brackish water, is one of the main species used to make fish paste in Myanmar. Sometimes, whole fish can be seen in fish paste prepared with bigger fish species. Processing may vary based on species, which may include cleaning, kneading, or pounding. The fish is then mixed with salt for fermentation, and the liquid produced during fermentation may be decanted for used as fish sauce (*Ngan-pyar-yay*).

Sometimes, in low-income families, *Nga-pi-yay*, a watery preparation, forms the main dish and is also the main animal-source food. It is one of the main ingredients in the dishes of Lower Myanmar, but it is not very popular in Upper Myanmar (e.g., Shan State).



Figure 5. (Top Left) Fish paste (*Nga-pi*), made with freshwater species; (Top Right) Shrimp paste (*Myin-nga-pi*). Credit: Ben Belton, 2015; (Bottom Left) Whole salted fermented fish (*Nga-pi-kaung*). Credit: Wae Win c, 2018; (Bottom Right) Shop selling fermented fish products, Ayeyarwady - fish sauce is in bottles. Credit: B. Belton, 2019

Sour fermented fish (*Nga-chin*) and shrimp (*Pa-zun-chin*)

Pickled fish (*Nga-chin*) and pickled shrimp (*Pa-zun-chin*), seen in Figure 6, are made by fermenting small fish or shrimps, mixed with rice and salt. Unlike fish or shrimp paste, it has a sour taste due to the fermentation with lactic acid bacteria. It is mainly consumed as a side dish, typically prepared raw or fried with onion and oil (Figure 6).



Figure 6. Sour fermented shrimp (Pa-zun-chin) and fish (Nga-chin) products for sale in Mon (Left) and Ayeyarwady (Right). Credit: B. Belton, 2014 and 2019

Fish consumption

In this section, we present results from the 2019-2020 NAG fish consumption survey. Except in Northern Shan, almost every respondent household (94 percent) had consumed at least one type of fresh or processed fish at least once in the preceding seven days. Shan North had the lowest fish consumption, with only 55 percent of households reported consuming fish in the past seven days. Processed fish was slightly more likely to be consumed than fresh fish across seven of the eight surveyed states and regions. Only households in Mon State reported a higher frequency of fresh fish consumption (see Figure 7).

DRIED FISH MATTERS

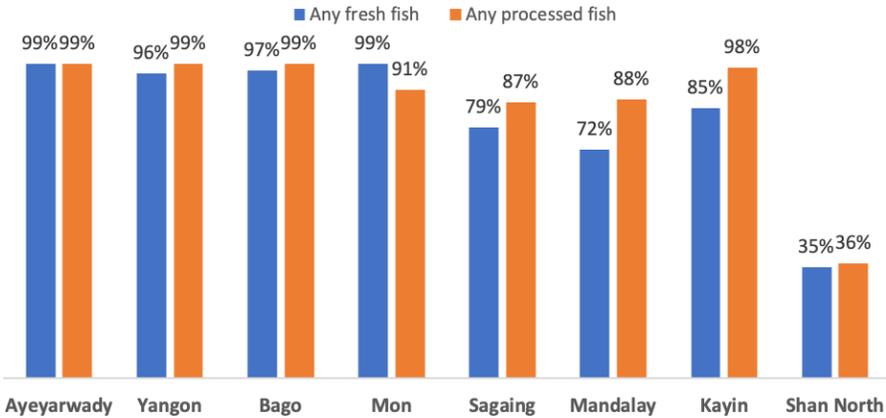


Figure 7. Percentage of households consuming 'any processed fish' and 'any fresh fish' in the preceding seven days, by location

Figure 8 illustrates the number of times surveyed households consumed different dried fish products and fresh fish, on average, in the seven days preceding the survey. Figure 8 underlines the extremely high frequency of fish consumption in Myanmar. Households in Delta and Coastal regions consumed fish an average of 14 times per week (i.e., an average of two meals per day). Fermented products were eaten on approximately half of these occasions (six or seven days per week). Frequency of fish consumption was somewhat lower in the Dry Zone and Kayin, but still substantial (10-11 times per week). Only in Shan North was fish consumption relatively infrequent (twice per week). The frequency of consumption of dried products (fish and shrimp) and fresh fish is approximately equal in all states and regions, at 3-4 times per week, underscoring the centrality of both sets of products to the diet in many areas of Myanmar.

21. DRIED FISH CONSUMPTION IN MYANMAR

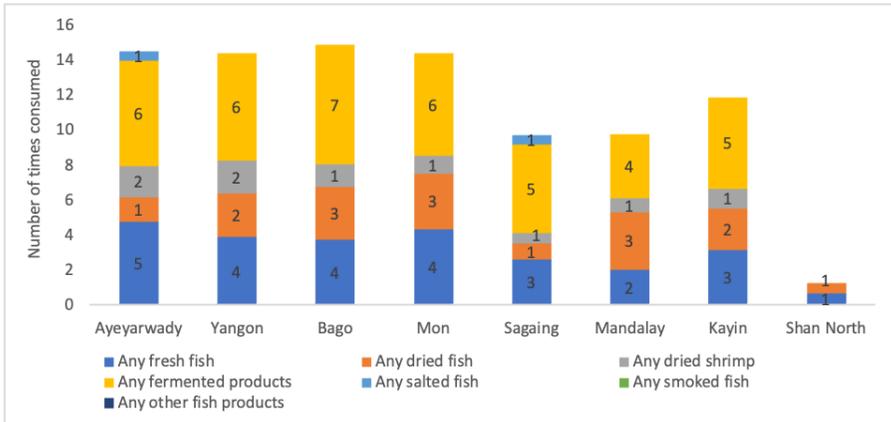


Figure 8. Average number of times surveyed households consumed fish products in the preceding seven days

Table 1 shows the percentage of households that consumed dried fish within a week. The most consumed fish product was fermented fish followed by dried fish and dried shrimp. The consumption pattern was almost the same for seven areas, but the eighth area Shan North has a much lower consumption percentage. The respondent households from there consumed more salted fish followed by dried fish and other fish products.

Table 1. Percentage of surveyed households consuming processed fish products in the preceding seven days, by product type and region

Category	N	Delta and Coastal				Dry Zone		Hills	
		Ayeyarwady (%)	Yangon (%)	Bago (%)	Mon (%)	Sagaing (%)	Mandalay (%)	Kayin (%)	Shan North (%)
Fermented products	744	90	91	95	89	84	66	87	6
Dried fish	545	57	73	73	77	40	74	77	18
Dried shrimp	280	42	53	30	35	20	19	43	0
Salted fish	145	22	9	3	19	20	6	8	20
Smoked fish	29	2	4	1	6	0	3	12	1
Canned fish	92	1	3	3	6	21	2	19	7
Other fish products	112	1	8	9	24	10	14	21	15

Fermented products were the most frequently consumed. Within the preceding week, 89-95 percent of Delta and Coastal households and 84-66 percent in the Dry Zone consumed fermented products. Only in Shan was consumption infrequent (eaten by 6 percent of households). Nga-pi-yay (liquid fish paste) is the most eaten fermented product, particularly in Delta and Coastal regions. Most respondents reported that the origin of the fish used was from freshwater sources, but they did not know which species were used. Consumption of Nga-pi-yay is less common in the Dry Zone, where Myin-nga-pi (shrimp paste) is the most regularly consumed fermented product.

Dried fish was the second most common category of processed product consumed, with the highest frequency of consumption reported in Mon and Kayin (77 percent of households) and the lowest in Shan (18 percent of households). Respondents identified 45 species of dried fish, but many also reported being unable to identify the species. Dried snakehead (freshwater) was the most consumed dried fish followed by dried Bombay duck (marine). Fish originating from marine and brackish water accounted for most of the species consumed in dried form, with giant catfish, chub mackerel, and pama croaker reported most frequently.

Dried shrimp was most frequently eaten in Delta, Coastal zone, and Kayin (30-53 percent of households), and by around 20 percent of households in the Dry Zone, but none in Northern Shan. Very small shrimp were the most frequently eaten of the four different size categories (jumbo, big, medium, small, and very small), as well as shrimp powder.

Consumption of salted fish was moderately common, reported by 8-20 percent of households in all regions except Bago (3 percent of households) and Mandalay (6 percent of households). Interestingly, salted fish was the most frequently consumed product form in Shan North (eaten by 20 percent of households). Twenty-two species of fish were reported to be eaten in salted form, with medium-sized freshwater fish the most common. The most important salted fish species were stone roller, *Manipur osteobrama*, walking catfish, and striped snakehead.

Smoked fish was the least consumed fish product, with consumption

reported mainly in Kayin (12 percent of households) and Mon (6 percent of households). Smoked products are mainly produced using small or medium sized freshwater fish, with fourteen species mentioned by respondents.

Figure 9 presents our estimates of annual per capita fish consumption by type of product and geography. These estimates were obtained by dividing the reported quantity of fish consumed by the household within the preceding seven days by the number of household members and multiplying by 52 to estimate total consumption per capita per year. The following results stood out. First, reported levels of annual fish consumption per capita are high in Delta and coastal (40-45 kg/capita/year), and in Kayin (34 kg kg/capita/year), intermediate in the Dry Zone (22-26 kg/capita/year) and low in Shan North (4 kg/capita/year). Second, average annual per capita 'dried fish' consumption (in the broad sense, including all aquatic animal products processed to aid preservation at ambient temperatures) was consistently high, ranging from 13.2-16.4 kg in Delta and Coastal, Mandalay and Kayin, and 8 kg in Sagaing, but only 2 kg/capita in Shan North. Third, the quantity of dried and fermented products consumed was approximately equal in Delta and Coastal and Kayin, with roughly 6-7 kg/capita/year of each type of product eaten annually. The highest level of dried fish consumption was reported in Mandalay (8.4 kg/capita/year), equal to the quantity of fresh fish consumed there. Levels of dried fish consumption also approached fresh fish intakes in Shan North (1.5 kg/capita/year and 2.2 kg/capita/year, respectively). Fourth, salted, smoked, and other processed fish products were consumed in small quantities on average, with salted fish consumption highest in Ayeyarwady, Sagaing, and Mon (1.1-1.8 kg/capita/year). Fifth, fresh fish accounted for approximately two-thirds (60-70 percent) of the fish consumed in Delta and Coastal, Sagaing, and Kayin, ranging from approximately 20-30 kg annually, but less in Shan North (2.2 kg, 49 percent) and Mandalay (8.4 kg, 39 percent).

DRIED FISH MATTERS

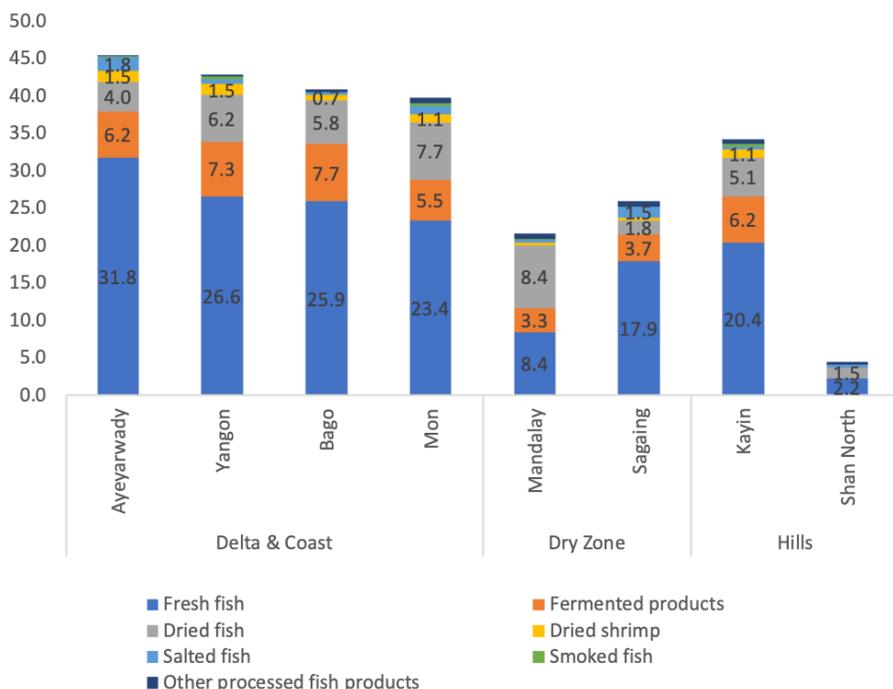


Figure 9. Annual consumption of fish products and fish (kg/capita/year)

Respondents reported that they purchased most fish products from nearby wet markets or village vendors. However, in Delta and Coastal and Kayin regions, substantial numbers of households reported producing dried and fermented products themselves (9-30 percent and 17-52 percent of households, respectively), indicative of a high level of involvement by survey respondents in these areas in commercial or subsistence fishing activities.

Fish processing significantly reduces the weight of fish consumed, primarily through dehydration. In Figure 10 we compare reported consumption of fresh and processed aquatic foods products with the estimated total quantity of fresh product required to produce them, using processing conversion factors for dried, salted, fermented, and smoked products reported in Hortle (2007). This comparison shows that in most regions of Myanmar, after accounting for loss of weight during processing the contribution of processed

21. DRIED FISH CONSUMPTION IN MYANMAR

products to total aquatic food consumption rises from approximately one-third to around half and exceeds three-quarters in two locations (Mandalay and Shan North).

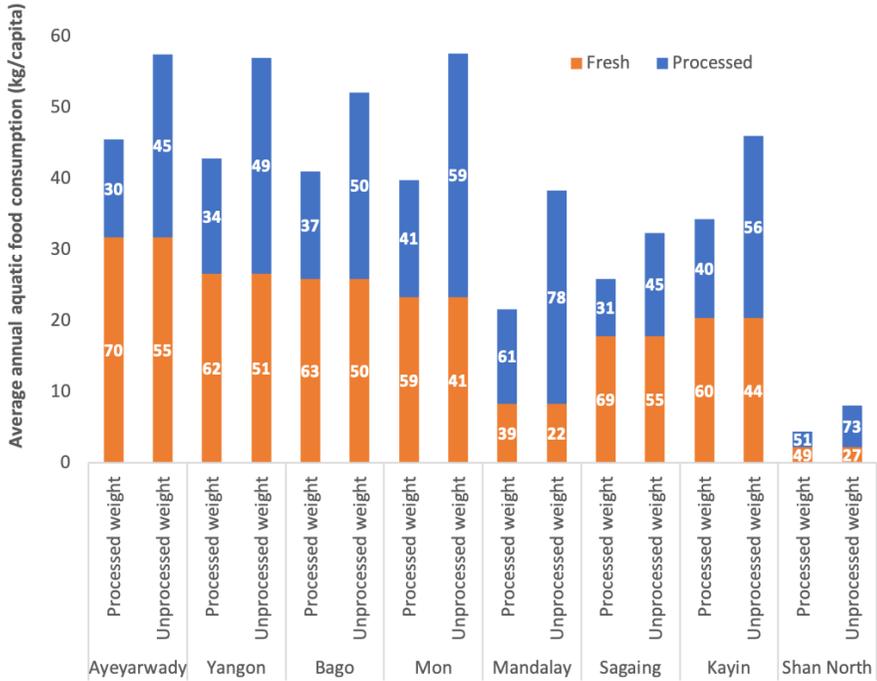


Figure 10. Estimated annual consumption of processed and fresh aquatic foods, adjusted for weight losses in processing, versus reported quantity consumed (unadjusted), (kg/capita/year).

Discussion

The survey results contribute numerous important insights into the role and significance of dried fish consumption in Myanmar, providing the first ever dedicated large-scale survey of dried fish consumption patterns in the country.

We found that an enormous variety of fish and other aquatic animals are processed into a wide array of product types that vary significantly across regions in terms of fish species, processing methods, ingredients, and preparations, likely reflecting differences in cultural preferences as well as the composition and abundance of aquatic resources in different areas.

For instance, 46 different fish species were identified as being consumed in dried form. Preparation of watery fermented fish (Nga-pi-yay) in Mon and Kayin is different from that in Ayeyarwady or the Dry Zone. The geographical origin of fish products or the name of the ethnic group involved in their manufacture is used to distinguish how they are processed and prepared, e.g., '*Kayin Nga-pi-yay*' which signifies nga-pi produced according to the methods used by people of Kayin ethnicity.

Variations in consumption of processed and fresh fish reflect geographical differences in production and access, which are only partially overcome by the trade in fish products between different areas of the country. Fish intakes are highest in the Delta and coastal regions and states, where the proximity to high concentrations of marine and inland capture fisheries and aquaculture influence consumers' options and preferences. In contrast, levels of consumption are lowest in Northern Shan, which is located far inland, in an upland area with relatively few water bodies. Here, fermented soy products may assume the role of a condiment that provides flavour and nutrients in dishes, as nga-pi does in other areas of Myanmar. Dried and fermented products from the Delta and coasts make an important contribution to consumption in the Dry Zone in central Myanmar, where fresh fish is less abundant. Despite limited fish production, high frequency of fish consumption in the Dry Zone indicates the importance of domestic fish trade, and especially the importance of dried fish in reaching areas with limited fisheries resources.

Frequency of consumption of fish, both processed and fresh, is remarkably high in all areas surveyed other than Shan North. Fish was consumed an average of 14 times per week in the Delta and coastal zone, with almost all households having consumed processed and fresh forms of fish within the week preceding the survey. Fermented products accounted for roughly

half of these instances of consumption, indicating the ubiquity of nga-pi as a condiment with meals. Most other instances of consumption are split approximately equally between dried products and fresh fish.

The average annual per capita consumption of fish products and fish reported in our survey is high compared to previous estimates, but the proportions of consumption allocated to processed products and fresh fish are similar. For instance, levels of fish consumption in the Delta and coastal zones reported in our survey (40-45 kg/capita/year) are approximately double the national average level of fish consumption of 21 kg/capita/year derived from the nationally representative Household Income and Expenditure Survey 2006 (Needham & Funge-Smith 2015). Using data from Myanmar's 2010 Household Income and Expenditure Survey, Belton et al. (2015) estimated annual average consumption of dried and fermented fish in Myanmar to be 6.4 kg/capita/year, which is approximately half of the amount recorded in most states and regions in our survey. However, the proportion of processed fish in total fish consumption (about one-third), reported by Belton et al. (2015) is consistent with that in our own survey. Regional variations in fish consumption levels reported by Belton et al. (2015) are also consistent with our findings (i.e., highest in Delta and coastal and Kayin, intermediate in the Dry Zone, and low in Shan).

This comparison raises questions regarding the methodologies of the respective surveys. The sampling strategy of the Household Income and Expenditure Surveys is designed carefully to ensure national representation, whereas our survey was implemented based on a convenience sampling methodology and does not statistically represent any defined population. Much of NAG's project work is with fishing communities. It is thus very likely that our sampling methodology overrepresented fishing households, which might be expected to consume more fish than average. It is also possible that the survey design, which included multiple specific questions and prompts about the fish products eaten within the preceding seven days, may have resulted in respondents' estimates being skewed upwards.

However, it may also be that conventional consumption surveys that collect data at more highly aggregated levels tend to underestimate consumption

because respondents are not asked to think carefully about all food items eaten. Hortle's detailed synthesis study of twenty dedicated fish consumption surveys from countries in the Lower Mekong Basin estimated average annual per capita consumption of aquatic foods (fish and other aquatic animals such as snails and frogs) to be 37.6 kg per year, of which 24.9 percent was comprised of preserved products (Hortle 2007). This is within a range comparable to our findings from the Delta and coasts.

This observation leads us to conclude that while our sampling strategy and survey methodology may overestimate average fish consumption at the population level for each of the surveyed states and regions, it also captures important components of consumption that might otherwise be missed or underreported when using less specialized survey instruments, underlining important implications for the design of future surveys.

Our estimates of the amount of fresh aquatic animals required to produce the processed products reported in our survey – the vast majority of which originate from capture fisheries – underline the enduring importance of the contributions that fisheries make to Myanmar's food and nutrition security despite the rapid growth of aquaculture in recent years. This point underlines the critical importance of instituting sustainable systems of inland and marine capture fisheries management for ecological and human health and wellbeing. The diversity of aquatic animal products consumed in Myanmar, and their significance in ethnic and regional cuisines, also underlines the need to consider their importance with respect to cultural dimensions of food security.

Finally, the diversity of dried and fermented aquatic foods produced and consumed in Myanmar, and the lack of research and policy attention they have received means that there is an acute lack of data available on their nutrient composition. Dedicated laboratory analyses of the nutrient composition of these foods are required to assess their contributions to the supply of multiple nutrients including minerals, vitamins, and essential fatty acids, and to Myanmar diets, nutrition, and health.

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References

Antonio, Miriam Esmaragda Romero. 2015. *Patterns of Access to Land by Chinese Agricultural Investors and their Impacts on Rural Households in Mandalay Region, Myanmar*. Universität Hohenheim.

Belton, Ben, Aung Hein Kyan Htoo, L. Seng Kham, Ulrike Nischan, Thomas Reardon, and Duncan Boughton. 2015. 'Aquaculture in Transition: Value Chain Transformation, Fish and Food Security in Myanmar.' <https://doi.org/10/13140/RG.2.1.1715.0805>.

Hortle, Kent. 2007. 'Consumption and the yield of fish and other aquatic animals from the Lower Mekong Basin.' Vientiane: Mekong River Commission. MRC Technical Paper, no. 16.

Needham, Steve, and Simon J. Funge-Smith, S. J. 2014. *The consumption of fish and fish products in the Asia-Pacific region based on household surveys*. Bangkok: Thailand. FAO Regional Office for Asia and the Pacific.

22. India's Fish and Dried Fish Trade: An Overview

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Introduction

India has a coastline of 8,118 km and an Exclusive Economic Zone of 2.02 million km². The fisheries sector plays a vital role in the Indian economy regarding employment generation, providing food and nutrition, and as a significant foreign exchange earner. Accounting for 7.58 percent of the global fish production, India is the second-largest fish-producing country today. The total fish production in the country during 2019-20 was reported at 14.16 million metric tonnes (MT), and the sector contributes about 1.24 percent of the gross value added and 7.28 percent to the gross agricultural value-added (Government of India 2021). It has a 5 percent and 0.1 percent share respectively in the global exports and imports of fish and aquatic products (<https://resourcectrade.earth>). It is also estimated that the fisheries sector provides livelihood opportunities for about 28 million people (Government of India 2021).

This chapter seeks to present an overview of India's fish and dried fish trade and the changes that have taken place over the years using two different data sets. The first of these is the data published by the Marine Products

Export Development Authority (MPEDA), which is the nodal agency for the holistic development of the seafood industry in India and has the mandate to promote the marine products industry with special reference to exports from the country. Data published by MPEDA (<https://mpeda.gov.in>) have been used to analyze trends and changes in the composition of the export of marine products from India over the years. In contrast, the second data set, the United Nations Commodity Trade Statistics Database (UN Comtrade)²⁷ has been used to carry out a more detailed analysis of the changes in the volume and value of trade and identify the major trading partners for the export, and import of fish and dried fish products from and to India. The UN Trade statistics Harmonized System (HS) classifications²⁸ for fish, dried fish, and related items since 1995-96 have been used for this purpose. Descriptive statistics, semi-logarithmic growth rates, graphs, and mapping tools have been used to analyze data and draw inferences.

The remainder of this paper is organized into the following sections. Section 2 analyzes the trends in the export of marine products from India using MPEDA data, followed by an overview of India's global trade regarding agricultural products in general and specific reference to fish and aquatic resources using UN Comtrade Statistics in section 3. Section 4 provides a more detailed picture of India's global trade in fish and aquatic resources, including dried fish, during 2019. The last section sums up the paper by highlighting the direction in which India's fish and dried fish trade are moving. It may be pointed out that the scope of the chapter is limited to providing a glance at India's trade in fish and dried fish products over the years and does not delve deeper into the factors determining the trade.

²⁷ The International Merchandise Trade Statistics (IMTS) data collected by national customs authorities are compiled into the United Nations Commodity Trade Statistics Database (UN Comtrade) by the United Nations Statistics Division. The data is available at <https://comtrade.un.org/data>.

²⁸ The Harmonized System, a six-digit code system, is an international nomenclature for the classification of products which allows participating countries to classify traded goods on a common basis for customs purposes. For details refer to <https://www.wcotradetools.org/>.

2. Trends in the export of marine products

According to the MPEDA, the export of marine products from India has grown significantly in volume and value over the years, rising from 0.296 million MT during 1995-96 to 1.38 million MT by 2017-18 before declining to 1.29 million MT by 2019-20. In 2020-21, the years affected by the COVID-19 pandemic, exports further reduced to about 1.15 million MT. The corresponding figures in value terms have been 1,111.46, 7,081.55, 6,678.69, and 5,956.93 million USD during 1995-96, 2017-18, 2019-20, and 2020-21 respectively (Figures 1 and 2).

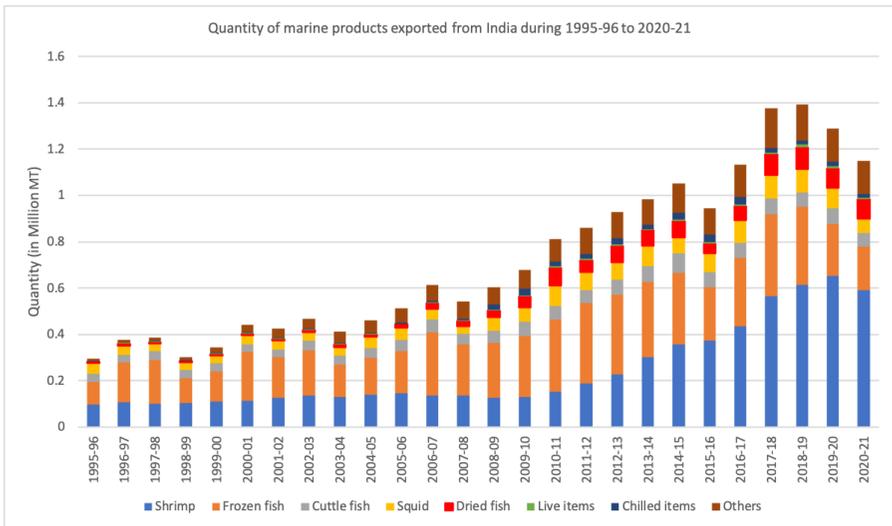


Figure 1. Quantity of total marine products exported from India during 1995-96 to 2020-21. Source: MPEDA (various years)

22. INDIA'S FISH AND DRIED FISH TRADE: AN OVERVIEW

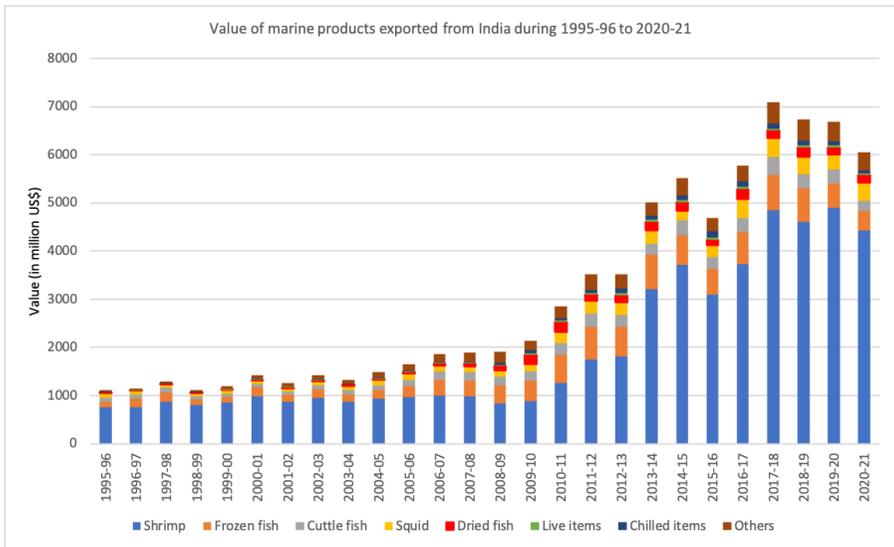


Figure 2. Value of total marine products exported from India during 1995-96 to 2020-21. Source: MPEDA (various years)

The marine product export basket consists of frozen shrimp, frozen finfish, frozen cuttlefish, frozen squid, dried, live, chilled, and others. Interestingly, the export of all marine products has recorded an upward trend during this period and more prominently so since 2009-10. Figures 1 and 2 reveal an increase in both volume and value of exports and a change in the composition of marine products exported. It is seen that the importance of frozen shrimp in the export basket of marine products from India has continued to increase. At the same time, there is a reduction in the export of other frozen fish and other items. The share of frozen shrimp in the total value of exports increased from 67 to 73 percent during this period. While the percentage of export of most non-shrimp items declined quantitatively and in value terms, the share of dried fish has increased. It is also important to note that the quantity of dried fish items which constituted about 3 percent of the total exports during 1995-96, has almost doubled by 2019-20. This observation prompted us to analyze the trends in the growth rates of exports of marine products item-wise from 1995-96 to 2019-20 in detail.

DRIED FISH MATTERS

The estimated semi-logarithmic (log-linear) growth rates²⁹ show that while the volume of exports increased at a rate of 6.5 percent, the increase in value terms was at a higher rate of 8.65 percent per annum during 1995-96 to 2020-21 (Figure 3). More specifically, the growth rates of shrimp, both quantitatively and in value terms, have been moving together. On the other hand, the increase in the value of frozen fish, cuttlefish, and squid have been much higher than their export quantity. In other words, India might have been exporting more valuable species in the later years.

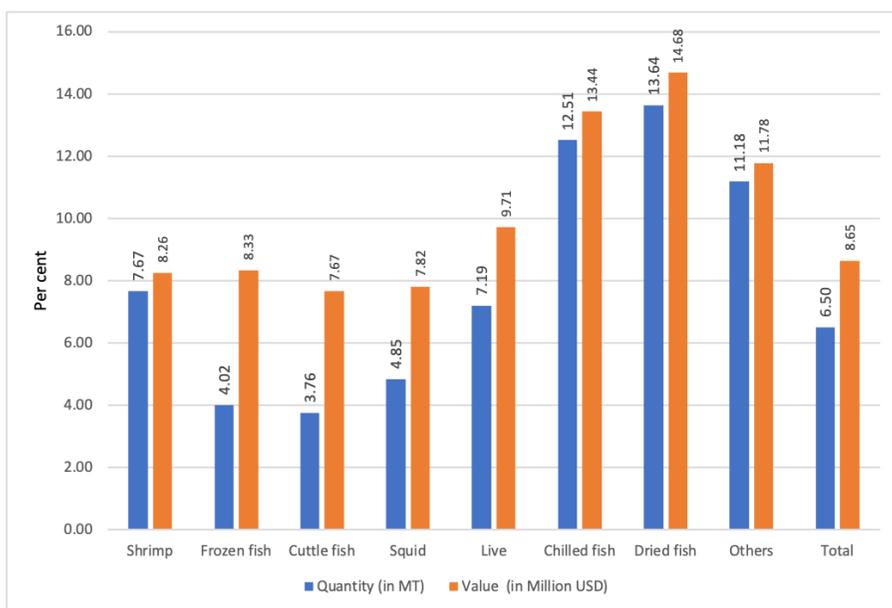


Figure 3. Growth rates of fish export from India during 1995-96 to 2019-20.

Source: MPEDA (various years)

It is interesting to note that the items like dried fish, chilled fish, and others had the highest growth rates during this period, even though their share in the

²⁹ We estimated the growth rates using the following equation $\ln Y(t) = \alpha + \beta.t$. The slope coefficient measures the relative change in Y (export of marine products) for a given absolute change in the explanatory variable (time).

overall export basket has not been very high. Export of dried fish increased at 13 to 15 percent and chilled fish at 12 to 13 percent per annum in quantitative and value terms, respectively. Although the share of these products in the total marine products export is still relatively low, it has almost doubled. It clearly shows the increasing prominence of dried fish in India's export basket of marine products in quantitative and value terms.

3. India's share in the global trade of agricultural, fish, and aquatic resources

India has been a significant trading partner in the global trade of agricultural products comprising fish and aquatic resources. The share in the international trade of agricultural products in general and specifically of fish and aquatic resources of India has shown an increasing trend since 2000. The share in the export of agricultural products has increased from 1.2 percent in 2000 to about 2.3 percent by 2019. Similarly, the share in fish and aquatic resource exports also registered an increase from 3.1 percent to 5 percent during the same period. It is important to note that the share of imports of these products has also been showing an upward trend. In line with an increase in the share of global commodities trade in export, the total value of agricultural products and fish and aquatic resources exports have seen a large increase. The total value of exports of agricultural products rose from USD 20.7 billion in 2000 to about USD 127 billion by 2019 (Table 1). Similar increases have also been observed in exports of all fish and aquatic resources, including dried fish. Although India's import of fish and aquatic products is less than the share of exports, the total value of imports and its share in the global commodities trade is increasing. India is a significant global trading partner of fish and aquatic resources, smoked, or otherwise treated.

DRIED FISH MATTERS

Table 1. Export and import of agricultural, fish, and aquatic products from India over the years. Source: *resourcetrade.earth* (compiled by the author)

	Export						Import					
	Share of global commodities trade (percent)			Total value (in USD)*			Share of international commodities trade (percent)			Total value (in USD)*		
	2000	2010	2019	2000	2010	2019	2000	2010	2019	2000	2010	2019
1. Agricultural products	1.2	2	2.3	20.7bn	107bn	127bn	0.9	1.6	1.8	3.6bn	16.1bn	21.5bn
1.1. Fish and aquatic resources	3.1	2.5	5	1.5bn	2.3bn	6.2bn	<0.1	<0.1	0.1	9.7m	67.7m	140m
a. Fish oil	0.2	1.1	0.3	649k	14.6m	7.2m	0.4	0.2	0.6	1.4m	2.3m	14.3m
b. Fresh or chilled fish, whole	0.3	0.3	0.3	15.9m	44.8m	73m	<0.1	0.2	0.1	3.8m	32m	23.7m
c. Frozen fish, whole	2.7	2.5	2	240m	484m	491m	<0.1	<0.1	<0.1	767k	5.6m	14.3m
d. Live fish	<0.1	0.4	<0.1	766k	6.8m	1.7m	<0.1	<0.1	0.2	22.7k	146k	3.3m
e. Other inedible marine products	2.3	1.9	1.2	11.1m	14.2m	12.5m	0.8	1	2.2	3.7m	7.6m	22.8m
f. Parts of fish, whether fresh, chilled, or frozen	0.4	0.7	1	30.7	135m	258m	<0.1	<0.1	0.1	5.5m	91k	31.4m
g. Seafood	6	5.8	14	1.1bn	1.5bn	5.3bn	<0.1	<0.1	<0.1	1.4m	17.5	32m
h. Fish, cured, smoked, or otherwise treated	0.5	0.6	1	14.8m	33.2m	67.2m	<0.1	<0.1	<0.1	187k	1.6m	3.2m

*bn= billion; m=million; k=thousand

In addition to the increase in total value and share in the global commodities trade, India has expanded its trade networks to export and import fish and aquatic products. During the last two decades, the number of countries India to which exported its fish and other aquatic products increased from 114 to 143. The countries to which India has shipped seafood and fish oil have shown a consistent increase, whereas there have been fluctuations in the case of some other fish and aquatic products exported.

22. INDIA'S FISH AND DRIED FISH TRADE: AN OVERVIEW

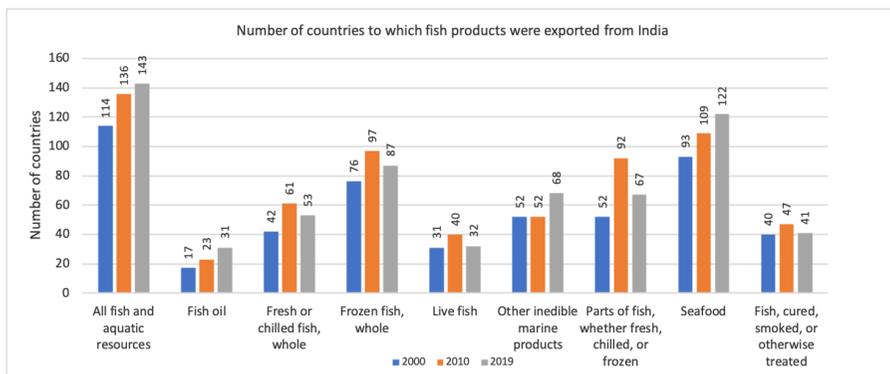


Figure 4. Number of countries to which India exported various fish and aquatic resources. Source: *resourcetrade.earth* (compiled by the author)

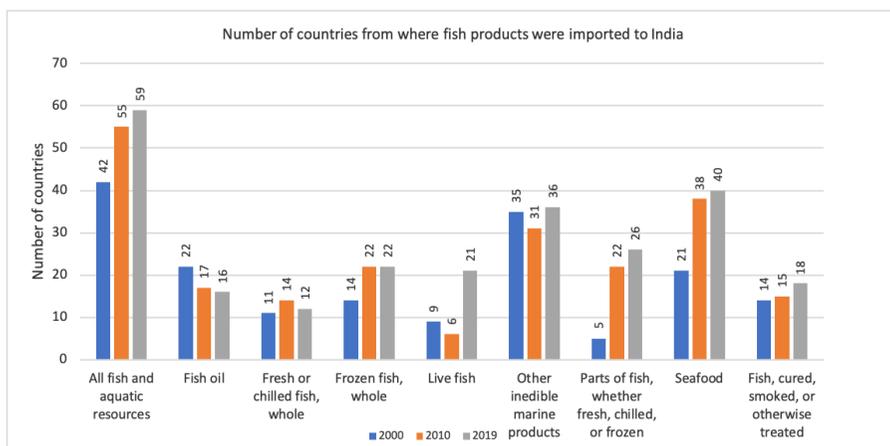


Figure 5. Number of countries from where India imported various fish and aquatic. Source: *resourcetrade.earth* (compiled by the author)

Compared to exports, India has been importing fish and aquatic products from fewer countries. However, its import trading partners have been increasing over the years. In 2019, India imported fish and aquatic products from 59 countries, of which it imported seafood from 40 countries and inedible marine products from as many as 36 countries.

4. Fish and aquatic resources trade and trading partners of India

This section presents a closer look into India's fish and other aquatic resources trade, including the dried fish trade and the trading partners in recent years. As per the UN Comtrade data, India exported fish and crustaceans, molluscs, and other aquatic invertebrates worth about USD 6,300.40 million in 2019. While India exported them to as many as 116 countries, the USA, accounting for 34.28 percent, and China, with 21.87 percent, were the major export markets of the above products from India. These figures mark a significant increase in the value of exports from USD 998.14 million in 1995 when India exported to about 69 countries in the world. At that time, Japan (41.6 percent), United Arab Emirates (10.06 percent), and the USA (9.69 percent) were the major export markets for India. Besides an increase in the value of exports, the countries to which India exported its fish and aquatic products have also increased over time. In 2005, the exports were valued at USD 1,466.66 million when India exported to 102 countries. A significant share of these products was shipped to the USA (24.65 percent), Japan (17.51 percent), China (8.82 percent), and Spain (7.50 percent) in 2005. In 2010, the export of Indian fish products increased to USD 2,163.68 million and involved trade with about 109 countries. While the USA (16.15 percent) continued to be a significant export market for Indian fish and aquatic products, the share of Japan decreased (13.16 percent). China (11.36 percent) was also emerging as a significant export market for Indian fish products.

Table 2. Volume of export of fish and fish products and significant trading partners of India. Source: <https://comtrade.un.org/data/> (compiled by the author)

	1995	2005	2010	2015	2019
Total value of exports (million US\$)	998.14	1,466.66	2,163.68	4,579.97	6,300.40
Major trading partners (percent)	Japan - 41.55	USA - 24.65	USA - 16.15	USA-26.84	USA - 34.28
	UAE - 10.08	Japan - 17.51	Japan - 13.86	Vietnam - 20.39	China - 21.87
	USA- 9.69	China - 8.82	China 11.36	Japan- 8.46	Japan - 6.65

22. INDIA'S FISH AND DRIED FISH TRADE: AN OVERVIEW

Figure 6 shows the flow of fish and aquatic products exports from India to the world during 2019. It is seen that India contributes to about a 5 percent share of the global fish and marine resources trade. During 2014-19, exports to China, Thailand, and United States witnessed the fastest growth, whereas exports to Mexico, Iran, Vietnam, South Africa, and Saudi Arabia declined considerably (Figure 6, Table 3).

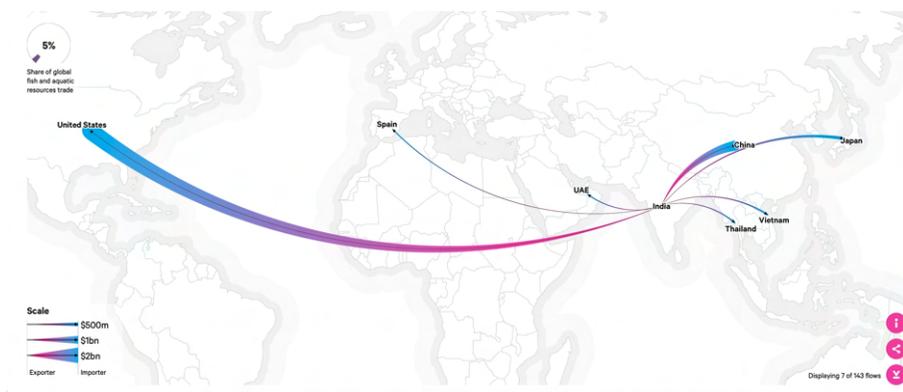


Figure 6. Major countries to which India exported fish and aquatic resources in 2019. Source: *resourcetrade.earth* (generated by the author in Dec 2021)

Table 3. Trade flows (Top 5 countries). Source: *resourcetrade.earth* (generated in Dec 2021)

Top 5	Fastest growing 2014-19 (percent)	Fastest declining 2014-19 (percent)
1. India to the United States US\$ 2.2 bn	India to China: +58	India to Mexico: -49
2. India to China USD 1.3 bn	India to Thailand: +14	India to Iran: -35
3. India to Japan USD 425m	India to the United States: +9.7	India to Vietnam: -23
4. India to Vietnam USD 247m	India to Greece: +5.8	India to South Africa: -23
5. India to Thailand USD 212m	India to Russian Federation: +5.3	India to Saudi Arabia: -21

In 2019, India imported fish and aquatic resources worth USD 140 m from

DRIED FISH MATTERS

about 59 countries contributing about 0.1 percent of the global fish and marine resources trade. The top countries from where India imported these products were Bangladesh (USD 24.9m), Vietnam (USD 24.3m), the United States (USD 19.6m), China (USD 14.1m), and Myanmar (USD 7.9m). The imports of fish and aquatic products from Oman to India have increased by 130 percent and from Korea to India by 97 percent during 2014-19. On the other hand, imports from Tanzania and Poland to India have declined by 56 percent and 43 percent, respectively (Figure 7, Table 4).



Figure 7. Major countries from which India imported fish and aquatic resources during 2019. Source: resourcetrade.earth (generated by the author in Dec 2021)

Table 4. Top 5 Major countries from which India imported fish and aquatic resources during 2019. Source: resourcetrade.earth (generated by the author in Dec 2021)

	Top 5	Fastest growing 2014-19 (percent)	Fastest declining 2014-19 (percent)
1	Bangladesh to India: US\$ 24.9m	Oman to India: +130	Tanzania to India: - 56
2	Vietnam to India: US\$ 24.3m	Korea, Republic to India: +97	Poland to India: -43
3	United States to India: US\$ 19.6m	Belgium to India: +61	France to India: -27
4	China to India: US\$ 14.1m	Malaysia to India: +41	Denmark to India: -17
5	Myanmar to India: US\$ 7.9m	China to India: +39	United Kingdom to India: -6.6

The import of fish, cured, smoked, or otherwise treated during 2019 has been less than 0.1 percent of the global trade and was valued at USD 3.2m. India

22. INDIA'S FISH AND DRIED FISH TRADE: AN OVERVIEW

imported these products from about 18 countries led by Bangladesh (USD 1.4m), the United Kingdom (USD 538k), Malaysia (USD 493k), the United States (USD 248k), and Norway (USD 160k).



Figure 8. Major countries to which India exported dried fish during 2019.

Source: resourcetrade.earth (generated by the author in Dec 2021)

Indian fish, cured, smoked or otherwise treated having about 1 percent of share in global trade were exported to about 44 countries such as Hong Kong, Bangladesh, Thailand, Sri Lanka and China in 2019. In the past, varying quantities of Indian dried fish products were also shipped to countries such as Japan, United States, Nigeria, Singapore, Nepal, Malaysia, Mauritius, Tanzania, Vietnam, Egypt, Spain, United Arab Emirates, Indonesia, and Bhutan in addition to the above countries. Within the category of fish, cured, smoked, or otherwise treated, India contributed to about 2.6 percent of global trade in dried fish, other than cod, not smoked with a total value of USD 23.9m. Bangladesh (39 percent) and Sri Lanka (38 percent) were the two leading export countries in 2019, followed by China, Hong Kong, and Bhutan, to which India exported these products. India exported these products to as many as 29 countries across the globe. Considerable increases in export volumes in 2014-2019 included exports from India to Singapore (149 percent),

India to China (82 percent), and India to Bangladesh (73 percent). However, India's exports to Thailand (-62 percent) and India to China, Hong Kong SAR (-46 percent) recorded a considerable decline. India exported anchovies, salted or in brine, not dried or smoked, to the value of USD 251k, constituting about 0.3 percent of its global trade in 2019. Almost 94 percent of this was exported to the United States and the remainder to Ireland (2.4 percent), the UK (2.4 percent), Kuwait (0.9 percent), and UAE (0.3 percent).

Further, India contributed about 3.1 percent of global trade in cod (dried, salted or unsalted but not smoked), at a value of USD 39.5m. Hong Kong (89 percent) was a significant export market of dried cod, whether salted or not salted but not smoked from India in 2019. India also exported fish flour, meal, and pellets for human consumption with a total worth of USD 350k to Nigeria (32 percent), Hong Kong (30 percent), UAE (20 percent), Japan (14 percent), and China (3.1 percent) in 2019. This represents a sharp decline from the USD 944k value of export of the same items from India in 2000. India had exported these products to 14 countries comprising 2.5 percent of the share of its global trade in these products. The countries to which India exported flour, meal, and pellets for human consumption included Japan (26 percent), Hong Kong (19 percent), China (16 percent), Thailand (11 percent), Germany (8 percent), Singapore (6.1 percent) and Italy (2.7 percent).

22. INDIA'S FISH AND DRIED FISH TRADE: AN OVERVIEW

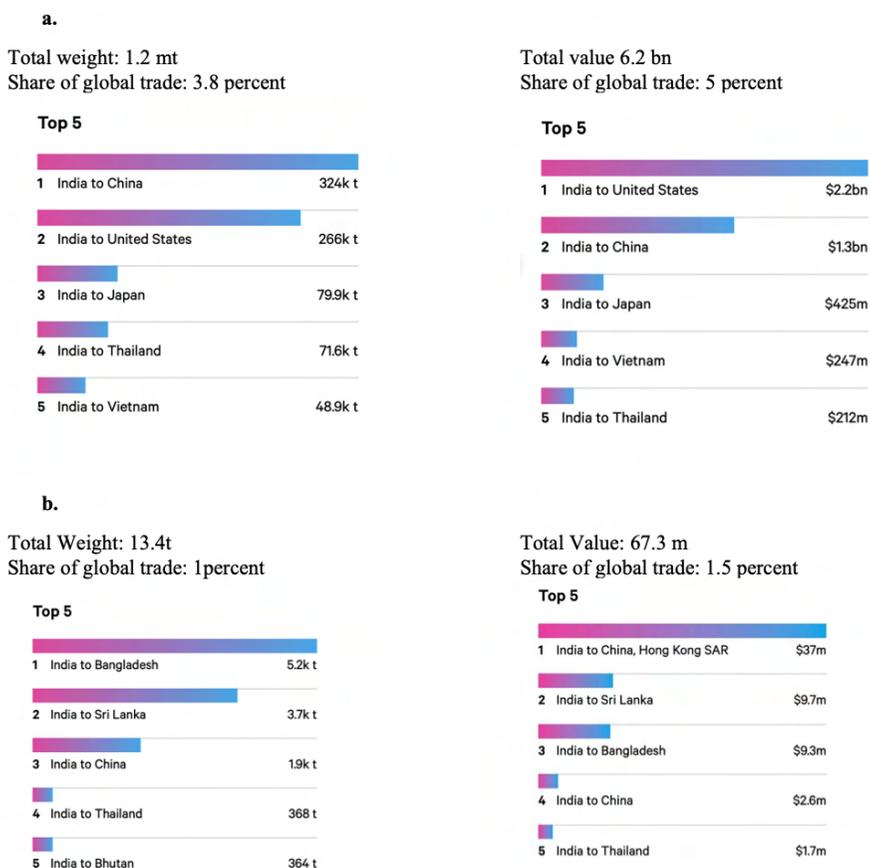


Figure 9. India's major export trade partners for fish and aquatic (fresh and dried) resources in 2019. (a) Fish and aquatic resources; (b) Fish cured, smoked, and otherwise treated (dried). Source: *resourcetrade.earth* (generated by the author in Dec 2021)

As far as dried fish products imports are concerned, India imported from ten countries in 2019. In quantitative terms, more than 90 percent of the dried fish imports were from Bangladesh, followed by Malaysia (3.69 percent) and the United Kingdom (2.25 percent). In value terms, the same countries contributed about 49 percent, 22 percent, and 16 percent of imports,

respectively.

Summary

This chapter has attempted to overview India's fish and dried fish trade. We used two prominent data sets provided by MPEDA and UN Comtrade. The analysis shows that besides witnessing an increase in the volume and value of trade in fish and aquatic resources, the composition of the export basket has also undergone tremendous changes in recent times. While shrimp continues as a significant component of the export basket, items like dried fish have registered one of the fastest growth rates among all the marine products exported. An analysis of the UN Comtrade statistics reveals that the share of India in the global trade of fish and aquatic resources increased from 3.1 percent in 2000 to 5 percent by 2019. In value terms, it has grown from USD 1.5 bn to USD 6.2bn, and the number of countries to which India exported its marine products also increased from 114 to 143. Similarly, India's share of fish, cured, smoked, or otherwise treated (including dried fish) in global trade also increased in quantitative terms from 0.5 to 1 percent and in value terms from USD 14.8m to USD 67.2 m with exports to over 40 countries. While imports are comparatively lower than that exports, India has registered an overall increase in their volume and value. The number of countries where India imports fish and other aquatic products has also increased. These indicate the importance of fish and aquatic resources in India's global commodities trade.

Over the years, the USA, China, and Japan have emerged as India's primary export markets for fish and other aquatic products (Figure 9). Nearly 63 percent of fish and other aquatic products were exported to these three countries in 2019. On the other hand, India imported these products mainly from Bangladesh, Vietnam, the USA, China, and Myanmar. As far as the export of dried fish and related items is concerned, Bangladesh and Sri Lanka, followed by China, Hong Kong, and Bhutan, are India's major export markets. India has also recorded imports of dried fish and related items from about ten countries. More than 90 percent of these imports are from Bangladesh and

the remainder from Malaysia and the United Kingdom. Overall, it is seen that India's share in the global trade of fish and other aquatic resources, including dried fish and related items, has been increasing over this period. As revealed by the number of its import and export partners, the trade networks have also been growing over time.

Acknowledgments

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References

Government of India. 2021. Economic Survey 2020-21, Volume 2, Ministry of Finance, New Delhi.

MPEDA. 2021. Annual Report 2020-2021. Ministry of Commerce and Industry. Government of India. Kerala: Koch.

23. Online Marketing and E-commerce of Dried Fish in Thailand

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Dried seafood products are important to Thailand's economy, reaching 51,954 tonnes of production in 2017 and an estimated USD 161 million (DoF 2019). The primary production areas of dried seafood products in Thailand are Chonburi, Rayong, Chanthaburi, and Trat provinces on the east coast (Butkhot et al. 2019). One of the most common dried seafood is dried fish, which are typically sundried, but which can also be salted, fermented, and smoked. Dried fish does not require expensive processing equipment and materials to make. The most important feature of dried fish products is their affordability and portability, making them more accessible to consumers, especially in remote places.

The rise of online marketing and e-commerce of dried fish products as a response to the COVID-19 pandemic

Global lockdowns, social distancing, and staying at home policy were implemented at the start of the COVID-19 pandemic in early 2020. Food businesses, including those working with dried fish, struggled throughout the pandemic. Some of them were able to go online in order to maintain their business and meet a steady consumer demand. Globally, e-commerce retail trade share increased from 14 percent in 2019 to 17 percent in 2020 (UNCTAD 2021). In Thailand, a jump of 60 percent on downloads of shopping apps was seen in just one week during March 2020 (UNCTAD 2021). Large numbers of dried fish vendors utilized online platforms to buy and sell their products as a way to deal with the COVID-related restrictions. E-commerce has become a growing business model, especially for dried fish products to serve both domestic and international markets.

General description of e-commerce and its various channels/avenues

E-commerce (also known as Electronic commerce) refers to transactions conducted via the Internet i.e., buying and selling products and providing services online. It offers many benefits by allowing anyone to sell anywhere. It is convenient and provides a 24-hour-a-day storefront for the business. It gives straightforward and fast way to purchase with quick delivery, and easy returns. Online marketing offers a global reach for goods and services. Companies can sell their products to customers worldwide through e-commerce sites. It also provides minimal startup and operating costs since a physical shop is no longer required.

There are different types of e-commerce, namely B2B, B2C, D2C, C2C, and C2B (Nemat 2011). B2B or business-to-business describes the transactions between businesses such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer. This type of e-commerce involves selling

raw materials, software, or any finished products. Often B2B is much higher in volume than B2C which is the business-to-consumer model. B2C is the most popular form of e-commerce, involving business transactions to end consumers (Nemat 2011). An example would be buying dried fish from an online retailer. This is like direct-to-consumer online retail (D2C), in which a commercial brand sells directly to its end customer without going through a retailer, distributor, or wholesaler. This type of e-commerce often applies to subscriptions and social marketing via social media like Instagram, Pinterest, Facebook, etc. Consumer-to-consumer (C2C) is another model of e-commerce wherein a consumer sells goods or services to another consumer (Nemat 2011), typically on platforms like eBay, Etsy, etc. Finally, there is the consumer-to-business (C2B) model where individuals sell their services or products to a business organization. It usually applies to influencers offering exposure, photographers, consultants, freelance writers, etc.

Examples of business for e-commerce include retail, dropshipping (Singh et al. 2018), digital products, wholesale, services, subscription (Paul & Rosenbaum 2020), and crowdfunding (Kuti & Madarsz 2014). Retail refers to selling products directly to the consumer. Dropshipping means selling manufactured products to consumers via a third party without stocking actual products (Singh et al. 2018). Digital products include selling digital templates, courses, e-books, software, or online tools. Wholesale refers to selling products in bulk, usually to retailers. Services involve selling skills like coaching, tutoring, writing, etc. that are purchased and paid for online. Subscription refers to recurrent purchases of products or services that enable shoppers to receive products automatically (Paul & Rosenbaum 2020). Lastly, crowdfunding allows sellers to raise funds for their startup capital to bring their products to the market (Kuti & Madarsz 2014). Products are only created and shipped once enough consumers have made the purchase.

Amazon, eBay, and Alibaba are some of the top e-commerce companies. In Asia, Lazada and Shopee are among the major e-commerce platforms. Shopee, originally known as Garena, was established in 2015 and has expanded globally in Malaysia, Indonesia, the Philippines, Taiwan, and Vietnam and even in Brazil (Khanijoh et al. 2020).

The opportunities of dried fish e-commerce to help increase income for producers (harvesters and processors)

Dried fish e-commerce in Thailand is a growing business platform, with some online vendors having been in operation for more than eight years. Newly created websites and Facebook groups dedicated to dried fish buying and selling are growing, especially during the COVID-19 pandemic. Dried fish vendors use a variety of online platforms for their business. The most common are Lazada, Shopee, and Facebook. More than 3,000 vendors are on Shopee and more than 64,000 are on Lazada. Vendors selling on this platform offer a wide range of dried fish products (including dried anchovies, dried fish, dried squid, and dried shrimp), especially from Prachuap Khiri Khan, Samut Sakhon, Phetchaburi, Rayong, and Surat Thani Provinces (Figure 1). Some vendors also use Instagram to sell dried fish products (Table 1).

There are several Facebook groups selling dried fish in Thailand. Some of the groups that are offering both wholesaling and retailing of dried fish products have more than 200,000 group members. Some sellers source their products directly from harvesters and processors located in different provinces. The majority of these Facebook groups were created at the beginning of the COVID-19 pandemic in 2020 and 2021, but new groups continue to appear. Some groups are for wholesale merchants only, while many allow any member to post and sell their dried fish products on the Facebook group. Some vendors offer to resell their products to group members.

DRIED FISH MATTERS

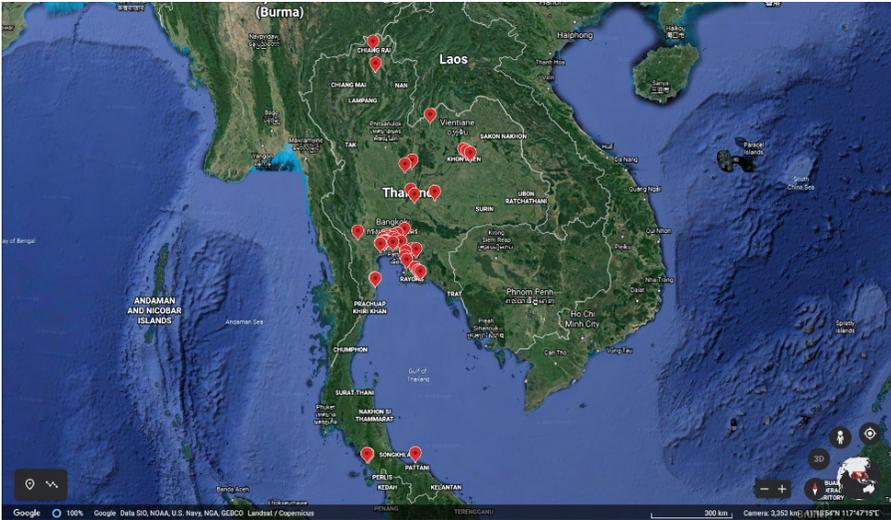


Figure 1. The geographical location of dried fish vendors in Thailand based on the list from SMELeader. Source: www.smeleader.com. Credit: Google Earth Pro

Another popular way of selling online on Facebook is called 'live selling', where the vendor uses a video setup (live streaming) to show and sell the products to live viewers. Facebook Live was launched to users in August 2015 and by April 2016 everyone could stream videos (Liao et al. 2022). In some cases, the vendors share their personal stories with their followers allowing for social interaction and building relations (Wongkitrungrueng et al. 2020). Globally, Thailand accounts for 11.26 percent of live streaming media produced and about 8 percent of streaming media users (Liao et al. 2022).

*Table 1. A summary of vendor information based on data from SMELeader.**Source: www.smeleader.com*

No. of vendors	50
Vendors with active websites	11
Vendors using Instagram	3
Vendors offering retail	43
Vendors offering wholesale	34
Vendors offering nationwide delivery	43
Vendors offering overseas delivery	8

With live streaming, the vendors' interactions and expressions are transmitted to customers in real-time, digitally allowing for a sense of direct, synchronous communications between them (Wongkitrungrueng et al. 2020). This is also called conversational commerce or 'c-commerce'. It enables direct communication with potential buyers. It is effective because viewers can buy the product by commenting on the code that they are interested in buying, and the product will be reserved for them. The novelty of using Facebook Live in marketing has prompted one entrepreneur from a southern province of Thailand to generate 20 tonnes per month of Thai dried seafood products, worth over USD 600,000 in sales via Facebook Live in 2020 (Ridmontri 2020). Since then, there have been more dried fish vendors joining the e-commerce market, but with lower sales volume. However, this has still benefited vendors and the many fisherfolk who supplied fish products in Thailand. Facebook Marketplace is also a good place for anyone with a Facebook account to buy and sell products locally. Some dried fish products from Thailand are also listed on popular e-commerce platforms like Alibaba, eBay, and Amazon for the international market.

During the initial research conducted from January 11th, 2022 to February 14th, 2022, a total of 58 Facebook groups and 72 Facebook pages involved in selling dried seafood were found. Through following these groups and pages, it was found that some have been inactive since 2021. These groups were therefore excluded from the monitoring. The creation of Facebook groups for selling dried fish significantly increased during the COVID-19 pandemic,

DRIED FISH MATTERS

from only one in 2012 to 12 in 2020, and 23 in 2021 (Table 2). There was a substantial increase in the Facebook groups created in 2020 (21 percent) and a significant further increase in 2021 (40 percent).

A Facebook group is a place to communicate about shared interests with people who join the group as members. Any individual or existing Facebook page can create a group. Facebook groups can be public or private. In private groups, one needs to become a member to view the posts. If a group is public, members can post, whereas only the administrator can post, update stories, and share events in private groups. On the other hand, Facebook pages are places on Facebook where artists, public figures, businesses, brands, organizations, and nonprofits connect with their fans or customers who like or follow them so they can start seeing updates in their feed. Mostly, only the administrator or the page owner can post and update stories and events. As a page follower, anyone can interact or communicate with the administrator by sending them direct messages or by commenting on their posts. Many of the Facebook dried fish pages were created in 2017 (23 percent), in 2019 (15 percent), and 2021 (13 percent) (Table 2).

Table 2. The number of Facebook groups and pages about dried fish created since 2011

Year	Facebook Groups created	Facebook Pages created
2011		1
2012	1	4
2013	1	1
2014	1	4
2015	3	5
2016	3	7
2017	2	14
2018	8	5
2019	3	9
2020	12	3
2021	23	8
Total	57	61

Based on personal observation on the Facebook pages, the most common dried fish products sold online are dried squid, dried shrimp, salted fish (mackerel, tilapia), dried fish, and dried prawns. These products are posted on almost all the Facebook pages monitored during the initial research. These are mostly uncooked, packed in vacuum-sealed plastic bags. Other uncooked products include smoked fish, sweet mackerel, seasoned sea bass, fish meat, dried clams, fish roe, fish noodles, dried shredded squid, and sweet squid with sesame seeds. While most of the products are uncooked, some vendors offer ready-to-eat dried seafood for retail sale that can be delivered straight to consumers' doorsteps. Such cooked products include crispy fish, such as anchovies or similar small fish with herbs, sesame seeds, or other seasonings. Dried fish skin is an emerging product. It is made from fish skin (e.g. *Pangasius* fish) and is sold dried and uncooked or as crispy fried and flavoured snack. It is a healthy snack, and contains significant amount of protein and collagen, an excellent anti-aging food source. Facebook vendors advertise their products in terms of quality (freshly caught and processed immediately), health benefits and Halal certification. Some products are community-based, usually showing the 'One Tambon One Product (OTOP)' certification. The OTOP programme, initiated in 2001, is a national policy that aims to promote rural development in Thai communities by supporting unique, locally made and marketed products of each Thai sub-district (Natsuda et al. 2012; Muslim et al. 2020).

Customers have the option to send their orders or inquiries via their Facebook page, website order form, or by phone (i.e., line, messenger, phone call or text), and email. Payments are made by remittance, credit or debit card, bank transfer, or cash on delivery. Many of the vendors have nationwide delivery and some offer overseas delivery through a private shipping company (e.g., Kerry Express). The delivery usually takes one to three business days.

Most dried fish products are affordable. For instance, dried anchovy costs about 25 Baht for 70 g pack or 60 Baht for a 100 g pack. Dried squid and dried shrimp are usually priced higher among all other dried fish products primarily due to the high cost of the raw materials. However, prices vary depending on size and the quality of the dried fish products. Smaller dried

squid (1 inch in size) cost around 750 Baht per kg, medium-sized (3 inch) about 850 Baht per kg, and bigger ones (5 inches and above) around 950 to 1,500 Baht per kg. For dried shrimp, the price is about 650 Baht per kg. These prices are based on observation of Facebook posts during the initial research.

Regulations in online selling

In Thailand, e-commerce is governed by the Electronic Transactions Act (ETA) and Direct Sale and Direct Marketing Act (DSDMA) (Bangkok Post 2013). Both were enacted in 2002 and apply to all commercial and civil transactions that use electronic means, except for certain contracts excluded by Royal Decree. Generally, all e-commerce businesses are required by law to register with the Ministry of Commerce if they only exist online, without a physical location where customers can examine products (Bangkok Post 2013). However, there are certain exemptions for the registration requirement as in the case of a small or medium enterprise that is registered under the Small and Medium Enterprises Promotion Act B.E. 2543 (2000) (Bunruangthawor 2021).

For consumers, the Consumer Protection Act of 1979 applies to electronic transactions, stating that businesses should provide descriptions of the products offered on websites as all consumers have the right to comprehensive product information. Moreover, consumers are also protected by the unfair Contract Terms Act of 1997, which gives buyers the right to a fair contract when purchasing items either in person or online, and the Copyright Act of 1994, prohibiting the sale of counterfeit goods online (Bangkok Post 2013).

In addition to the national regulations, products sold on Facebook must comply with the site's commerce policies and Community Standards (Bradford et al. 2019) which state that buyers and sellers are responsible for complying with applicable laws and regulations. Failure to comply with policies may result in removal of product listings and other content, rejection of product tags, or suspension or termination of access to any or all Facebook commerce surfaces or features. If vendors repeatedly post content that violates the policies, additional actions will be taken. Facebook administrators

further state that they reserve the right to reject, approve, or remove any listing for any reason at any time, at their own discretion.

Online consumerism in Thailand

Based on a study conducted by Laochariyakul (2014) on Thai online consumers, online shoppers have the following characteristics: 80 percent are female and 20 percent male; the majority are within the age range of 25-35; 59 percent have at least a bachelor's degree, and 4 percent have a master's degree and above; the largest number have an average monthly income of 25,001 – 35,000 Baht, followed by those with an income of 15,000 – 25,000 Baht; and 67 percent worked professionally. According to Laochariyakul (2014), the key factors affecting consumer preference in online food purchases are product appearance (products look fresh and delicious) and nutritional value. Moreover, products sold must be at a reasonable price. Consumers also like the ability to connect directly with sellers to get more product information (Laochariyakul 2014). In general, buyers find online shopping convenient, although shipping cost and poor warranties can be a limiting factor to online buying (Laochariyakul 2014). The comments section on the vendor's Facebook posts could also influence online buyers. Based on observations made during our the initial monitoring on Facebook pages in Thailand, some Facebook users post dissatisfied comments when products do not look as good as the pictures shown on the Facebook posts. There are also concerns about dried fish being smelly. Overall, however, dried fish sold in Thailand are properly sealed and well-packaged and have no odor.

Selling dried fish online has several advantages

Typically, dried fish are sold in stores and markets. E-commerce enables vendors to take orders through their Facebook pages, Instagram or websites and other e-commerce platforms like Shopee or Lazada, without needing to have a physical storefront. Some vendors combine a physical storefront with online retail. Many retail vendors can source dried fish products that

are available in different provinces in Thailand, without having to travel to those locations to purchase them. In effect they are both buyers and sellers of these products.

Most businesses use Facebook as a new approach to selling and connecting with their consumers (Marsden 2011). Facebook is a popular social media platform around the world and in Thailand. Based on Internet World Stats (2021), there are 46 million Facebook users in Thailand in 2019 making it the seventh-highest number of Facebook users in the world. This is more than half of the population in Thailand in 2021 (population of 69,950,850) (United Nations 2021). Selling online, particularly on Facebook, allows a wider reach to diverse customers, locally and internationally.

Researching dried fish e-commerce in Thailand

Dried fish e-commerce in Thailand has been around for more than ten years, and it increased significantly during the COVID-19 pandemic. Many vendors have shifted the typical strategy of selling in markets or stores to selling online, however, will dried fish e-commerce persist? What will the future of dried fish e-commerce look like?

Numerous questions arise from this preliminary study about the rise of online sales of dried fish during the COVID-19 pandemic. What are the opportunities for fishing communities and groups of women in dried fish e-commerce? Did it help fishing communities, especially women and producers (small-scale or large-scale), with overcoming the challenges of the pandemic? Based on our preliminary findings, online platforms like Facebook provide opportunities for dried fish vendors to directly access and communicate with customers which is helpful in reducing operational costs. However, will this have an impact on the price of dried fish products compared to products sold in traditional local markets? Another point worth exploring in future studies is understanding who the key actors are in online selling platforms. Are they large traders or small and medium vendors? More importantly, does the online platform help address problems of food and nutrition security? Particularly, did e-sales of dried fish help poor communities during the

COVID-19 pandemic? Broadly, what are the challenges, the advantages, and the disadvantages of dried fish e-commerce given the diversity of dried fish online marketing?

References

Bangkok Post. 'Knowing the Law on E-Commerce.' Bangkok Post, June 23, 2013, <https://www.bangkokpost.com/thailand/special-reports/356478/knowing-the-law-on-e-commerce>.

Bradford, Ben, Florian Grisel, Tracey L. Meares, Emily Owens, Baron Pineda, Scott J. Shapiro, Tom R. Tyler, & Danieli Evans Peterman. 2019. *Facebook Data Transparency Advisory Group Releases Final Report*, p. 44. Yale Law School: The Justice Collaboratory. <https://law.yale.edu/yls-today/news/facebook-data-transparency-advisory-group-releases-final-report>.

Bunruangthawor, Threenuch. 2021. 'The State of E-commerce in Thailand.' Zicolaw, December 13, 2021, <https://www.zicolaw.com/resources/alerts/the-state-of-e-commerce-in-thailand/>.

Butkhot, Namphueng, Pornpimon Soodsawaeng, Sireeporn Samutsan, Kitikoon Chotmongcol, V. Vuthiphandchai, S. Nimrat. 2019. 'New perspectives for surveying and improving Thai dried seafood qualities using antimicrobials produced by *Bacillus velezensis* BUU004 against foodborne pathogens.' *Science Asia* 45, no. 2: 116. <https://doi.org/10.2306/scienceasia1513-1874.2019.45.116>.

Dof. 2019, 'Fisheries Statistics of Thailand 2017.' *Department of Fisheries, Ministry of Agriculture and Cooperatives*, no. 9. 92. https://www4.fisheries.go.th/local/file_document/20200714161650_1_file.pdf.

Internet World Stats. 2021. 'Asia Internet Usage Stats Facebook and 2021 Population Statistics.' Internet World Stats. <https://www.internetworldstats>.

com/stats3.htm.

Khanijoh, Chonticha, Chompu Nuangjamnong, and Kitikorn Dowpiset. 2020. 'The impact of consumer's satisfaction and repurchase intention on e-commerce platform: a case study of the three e-commerce in Bangkok.' *AU Virtual International Conference Entrepreneurship and Sustainability in the Digital Era* 1, no. 1.

Kuti, Mónika and Gábor Madarász. 2014. 'Crowdfunding.' *Public Finance Quarterly* 59, no. 3: 355-366.

Laochariyakul, Porntida. 2014. 'Working professional attitudes toward buying ready to eat healthy food through Facebook and Instagram.' *Thammasat University*.

http://ethesisarchive.library.tu.ac.th/thesis/2014/TU_2014_5602040577_1541_492.pdf.

Liao, Shu-Hsien, Retno Widowati, and Pimchanok Puttong. 2022. 'Data mining analytics investigate Facebook Live stream users' behaviors and business models: The evidence from Thailand.' *Entertainment Computing* 41, no. 100478: <https://doi.org/10.1016/j.entcom.2022.100478>

Marsden, Paul. 2011. *F-commerce Selling on Facebook: The Opportunity for Consumer Brands*. SYZYGY Group. https://digitalwellbeing.org/documents/Syzygy_2011.pdf.

Muslim, Abdul Rozaq, Obsatar Sinaga, Arry Bainus, and Wawan Budi Darmawan. 2020. 'Implementation of Rural Development Policy in Thailand through the One Tambon One Product (OTOP) Movement.' *Systematic Review Pharmacy* 11, no. 1: 585-587.

Natsuda, Kaoru, Kunio Igusa, Aree Wiboonpongse, and John Thoburn. 2012. 'One Village One Product – rural development strategy in Asia: The case

of OTOP in Thailand.' *Canadian Journal of Development Studies / Revue Canadienne d'études Du Développement* 33, no. 3: 369-385. <https://doi.org/10.1080/02255189.2012.715082>.

Nemat, Rania. 2011. 'Taking a Look at Different Types of E-Commerce.' 1, no. 2: 101-104.

Paul, Justin, and Mark Rosenbaum. 2020. 'Retailing and consumer services at a tipping point: New conceptual frameworks and theoretical models.' *Journal of Retailing and Consumer Services* 54, no. 101977. <https://doi.org/10.1016/j.jretconser.2019.101977>.

Ridmontri, Chakrit. 2020. 'Facebook Live drives dried seafood sales in Thailand.' *Asian Agribiz*, February 19, 2020. <https://www.asian-agribiz.com/2020/02/20/facebook-live-drives-dried-seafood-sales-in-thailand/>.

Singh, Gurpeet, Harjot Kaur, and Amitpal Singh. 2018. 'Drop Shipping in E-Commerce: A Perspective.' *Proceedings of the 2018 9th International Conference on E-Business, Management and Economics - ICEME 2018*: 7-14. <https://doi.org/10.1145/3271972.3271993>.

Unctad. 2021. 'How COVID-19 triggered the digital and e-commerce turning point.' *Unctad*, March 15, 2021. <https://unctad.org/news/how-covid-19-triggered-digital-and-e-commerce-turning-point>.

United Nations. 2021. 'Population Division.' *United Nations*, 2021. <https://www.un.org/development/desa/pd/>.

Wongkitrungrueng, Apiradee, Nassim Dehouche and Nuttapol Assarut. 2020. 'Live Streaming Commerce from the Sellers' Perspective: Implications for Online Relationship Marketing.' *Journal of Marketing Management* 36, no. 5-6: 488-515. <https://doi.org/10.1080/0267257X.2020.1748895>

24. From the Neoclassical Economic to the Social-Ecological System Perspective: A Novel Outlook on Dried Fish Value Chains

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Introduction

Dried fish is an integral part of food systems and social-cultural processes of communities in South Asia (Ruddle & Ishige 2010). India is the second largest fish producer in the world, with a total production of 14.16 million tons in 2019-20, out of which 26.31 percent was from marine fisheries. We have considered dried fish as cured fish, which includes dried, salted, in-brine, fermented and smoked fish. In India about 5 percent of total fish produced is used for drying. Fish drying is one of the most common post harvest practices carried out by artisanal fishers (Balachandran 2001). Fish drying helps to reduce post-harvest losses, generates household level employment mostly for women, and supplements the nutritional requirements of both coastal and mainland communities (Payra et al. 2018; Siddhnath et al. 2020). In maritime Eastern Indian states like Odisha and West Bengal, the share of fish

used for drying is 3.2 percent and 6 percent respectively (GoI 2020; GoO 2022). However, the share of dried fish in the marine fish catch is quite high; in Odisha, for example, it is about 15 percent (GoI 2020; GoO 2022).

Dried fish as a subsector has received little academic and policy attention despite its significant contributions to the nutritional and social wellbeing of the poor (Thilsted et al. 2014). The trade focus, along with growing attention to culture fisheries, commercial fishing, and marketing of frozen and live fish, have posed serious challenges to dried fish economy and ecology. These factors have also adversely impacted the life and livelihoods of people involved in the artisanal fishing sector who often have mixed identities as fishers, dried fish processors and local aggregators (Dey & WorldFish Center 2008; Pradhan et al. 2022a).

Value chain analysis can be preferable to other trade theories in explaining why the poor may face barriers to trade (Mitchell et al. 2009). A fish value chain is defined as a set of interlinked value-adding activities that convert inputs into outputs which, in turn, add to the bottom line and help to create competitive advantage for the business (De Silva 2011). FAO technical guidelines for responsible fishing have put stronger emphasis on value chain development of fish processing, trade, and poor-friendly market systems for enhanced economic efficiency and welfare gains in developing countries (Webster & Collins 2005, p. 54). In this conventional commodity value chain approach, value is perceived through a neoclassical economic understanding of value as financial gain (Belton et al. 2022; Pradhan et al. 2022), whereby value chain performance is measured at the firm and sector levels by aggregating financial gains from component segments. Analysis in these terms diminishes the intrinsic value of the commodity, by focusing on the marginal utility derived from the exchange of commodities across nodes and segments of a value chain, and ignores the processes and relationships that determine the production of a commodity (Fabinyi et al. 2018; Ferguson et al. 2022).

Interdisciplinary scholars have challenged neoclassical economic perspectives that singularly consider natural resources as commodities (Nayak & Berkes 2011; Fabinyi et al. 2018b; Johnson, 2018; Ferguson et al. 2022).

Products like dried fish, which are embedded in particular social, ecological, political, cultural and geographic contexts, cannot be considered in isolation from their multiple, ongoing social and ecological processes, dynamics and relationships (Adger 2006; Jentoft 2000; Pradhan et al. 2022a). A primarily financial perspective on fisheries value chains fails to account for non-capital and non-trade relationships that have a significant influence on complex social, ecological and institutional interactions across scales (Altenburg 2007; Ericksen 2008; Mitchell et al. 2009; Marshall 2015; Ferguson et al. 2022). Trade-focused emphases on revenue creation, optimization of labour-driven value chain performance, cost efficiency, technology upgrades, and expanded bill of materials³⁰ do not generally help the poor. The majority of the benefit from conventional value chain optimizations goes to actors in the downstream segments of value chains, such as traders, wholesalers, and retailers (Béné et al., 2010), while upstream fishers and processors benefit less.

This chapter aims to discuss the dried fish value chain by applying a social-ecological systems perspective that offers additional insights on a possible formulation of pro-poor value chains. The chapter also brings a new outlook towards a robust economic process that rests on a co-evolutionary approach to interdependencies between ecological sustainability, technological development, social innovation, market institutions, resource geography, and the wellbeing of upstream value-chain actors (i.e., producers and processors). A social-ecological system is defined here as an integrated, coupled, interdependent and co-evolutionary system with mutual vertical and horizontal feedbacks between ecological and social subsystems (Berkes et al. 2003).

³⁰ Expanded bill of materials widens up the use options of a particular input or commodity arising from multiple demand frontiers. In this case, the fish and livestock feed sectors along with expanded domestic market for live fish is causing the change in bill of material of small fish earlier used for drying.

Methods

The chapter is based on a macro-level analysis of secondary literature and empirical data obtained through field research in a coastal village in the Eastern Coast of the Bay of Bengal (see also Pradhan et al. 2022). A stepwise literature review was carried out, keeping in mind the thematic focus on Social-Ecological Systems (SES) perspectives on dried fish value chains. The literature review followed an explicit approach of identifying, selecting, and examining published works that could empirically enhance the scope beyond the dried fish literature. This review helped in identifying key attributes and variables for conceptualizing an SES-oriented value chain.



Figure 1. Village study in Kajalapatia village. Credit: Authors

The field research was conducted using a case study approach, allowing for a comprehensive, holistic and in-depth investigation of complex phenomena within their local context while giving attention to the perspectives of participants themselves (Yin, 2014; Merriam & Tisdell 2015; Creswell & Creswell 2017; Harrison et al. 2017). Empirical data were collected in

DRIED FISH MATTERS

Kajalpatia village of the Odisha coast. The village was selected at random from sites of substantial household-level dried fish operations, where fishing families engaged in fishing, processing, and marketing activities oriented toward the sale of dried fish. A village survey was conducted with all 58 households of the village. Thirty semi-structured interviews were conducted with respondents representing distinct economic groups, including fishers, processors, and local traders. The selected case study site has unique features as it includes a large estuarine area, which is highly significant for conservation with strong floral and faunal diversity. It is a habitat for IUCN red list species such as the Olive Ridley turtle and rare white crocodiles, in addition to encompassing a rich mangrove forest. Sociologically, the area is also dynamic with a large influx of fishers, who have permanently migrated from neighboring West Bengal and Bangladesh.

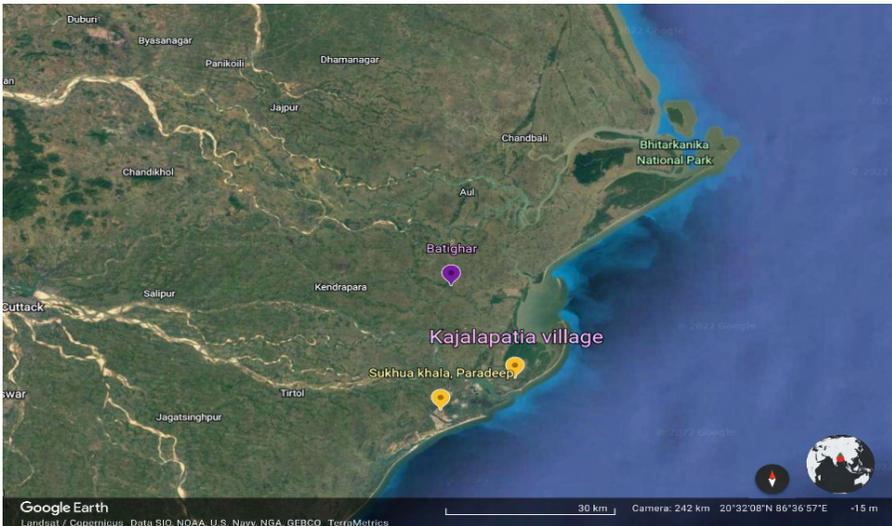


Figure 2. Kajalapatia, Jagatsinghpur, Odisha – case study site. Source: Google Earth

Dried fish value chains and social-ecological systems

A value chain framework offers an understanding of multi-layered interactions and exchanges between various market nodes with a strong focus on economic returns (Gereffi et al. 2005). A value chain is defined as the range of activities that are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), to delivery to final consumers, and finally disposal after use (Kaplinsky & Morris 2000). In recent decades, value chain models have gained particular importance in the food sector, as they are considered an important entry point into understanding the livelihood strategies for rural communities (Reardon et al. 2012). A typical value chain approach focuses on three major aspects: structure, conduct and performance (Attaie & Fourcadet 2003).

Structural complexities of dried fish value chains

A *structural* perspective helps in systematically mapping the economic agents who participate in the production, distribution, marketing, and sales of a particular product (or products). It also explains the distribution of benefits among economic agents in the chain and analyses the potential gain for each economic agent from increased organizational support (Attaie & Fourcadet 2003). While analysis of the value chain structure draws attention to the different nodes and economic agents through profit points, the biophysical resource system is only considered as part of the enabling environment. The notion of circulation, meaning exchange relations and the politics of buying and selling, governs the value chain for ecological products like dried fish. As a result, social-ecological dynamics (beyond the cost and revenue flow) are neglected at points of production, even though these have a strong bearing on the value chains as a whole (Baglioni & Campling 2017). Further, although fisheries have a determining role in shaping the supply and type of dried fish production, they are not necessarily considered nodes in the value stream. A dried fish value chain model, with a typical commodity orientation, often

treats the dried fish production space as the core production node for value chain interactions in the value stream. In reality, however, fisheries are not exogenous to the dried fish value stream as dried fish producers have overlapping identities as fishers, dried fish producers, dried fish processors, and sometimes commission agents as well (Pradhan et al. 2022).

In contrast, environmental historians describe ‘nature as a historical actor’ (Merchant 1987; Demeritt 1994). Nature as an independent agent “*reminds us that there are different forces at work and not all of them emanate from humans*” (Demeritt 1994, p. 163; Worster 1988, pp. 292–293). The social-ecological system oriented dried fish value chain model strongly recognizes the criticality of natural processes, and hence considers fisheries resource systems as an important value chain node (Pradhan et al. 2022). Natural capital, scale dynamics, disturbances, and uncertainties as key characteristics of the natural resource system have a strong bearing on the wellbeing of the actors who are linked to the resource system (Brueckner-Irwin et al. 2019). Additionally, historical and contemporary interactions within the value chain influence the behaviour and motivations of actors, as individuals located in a particular space and time who are also part of the larger collectivity that makes up the dried fish subsector (Brueckner-Irwin et al. 2019).

Fuzziness of nodes and actors in the value chain

Along the Eastern Coast of the Bay of Bengal in India, there are fuzzy boundaries across value chain nodes due to strong overlaps in the functioning of different economic agents operating within the dried fish value chain. Out of 58 respondents in the study village, 55 respondents had mixed identities as boat owners, fishers and processors. We refer to these mixed identities to explain the multiple, overlapping, and simultaneous roles that actors play within a value chain, indicating their strong economic capacity in some contexts, but socio-economic precarity elsewhere. This was evident from the results of our household survey. In about 93 percent of households, while male members worked as fishers, female members were primarily engaged in small-scale processing activities and also worked as wage labourers in

relatively bigger processing units in the village. Six percent of fishing and processing households, which had additional human resources but a limited capital base, simultaneously operated as local aggregators and traders.

Dynamic social-ecological interactions with the fisheries resource system

All survey respondents reported specific species of small fishes as preferred for drying, such as Chauli (Indian Anchovy), Small prawn, Marua (Indian Mackerel), Borei (Croaker), Bomalo (Bombay duck), Polagara (Indian Glassfish), and Mini Chandi (White Sardine). Further, more fish is available during the *uthia* and *padia*, the 12-day periods corresponding to the waxing and waning of the moon during each lunar cycle. Therefore, the catch is dynamic and not evenly distributed across the month. Dried fish not only provides an income opportunity, but also provides employment for relatively longer periods of time. During the lean period fishers buy 'C' class fish – low value small fish and/or fish that are in degraded condition and for which shelf-life cannot be increased even with the application of ice – from trawlers operating in the Exclusive Economic Zone (EEZ) and process these as dried fish. (According to the 2014 guidelines for fishing operations in the EEZ, deep-sea fishing is allowed in areas between the 12 mile mark and the 200 nautical mile mark from the shoreline.) Our village survey also suggests that about 57 percent of households settled here between 1920 and 1970 from neighbouring places and elsewhere in the state of West Bengal, drawn by the prospect of higher fish availability. Further, in-migration increased after the 1971 Bangladesh war as Bangladeshi migrants sought refuge in India. Social-ecological linkages are thus dynamic, and the entire dried fish operation is strongly influenced by the biophysical resource and its interactions with fisher groups. In consequence, the biophysical resource cannot be exogenous to the value chain, but is rather an important node of the dried fish value chain that influences the chain function.

Nonlinear interactions and dynamic linkages with fisheries systems and the actors in the value chain

Conduct describes value chain behaviour that is often motivated by profit and revenue gain through a linear system of exchange among economic agents (Kaplinsky & Morris 2000; Rosales et al. 2017). Value chain analysis is effective at considering the relationships among particular links in the chain (e.g. between a buyer and supplier), but is less successful at understanding horizontal linkages within and across different nodes of the entire chain (Lowitt et al. 2015; Pradhan et al. 2022a). The social-political construct of natural resources, in this case dried fish, is inherently relational. Just as humans determine natural resources through new use and exchange value, the principles and conditions of natural resources shape and determine the limits and potential of the production process (Baglioni & Campling 2017). The behaviour among the actors is therefore extremely dynamic and non-linear.

Value chain decisions often reflect tensions between the social and physical attributes of a resource and value chain adaptations. The profit point centrality in adaptation measures at times spurs competition within the chain for a different end use, market segment, or consumer base (e.g., the preparation of dried fish for human consumption or for animal feed). Horizontal factors are equally important as they help in analyzing participatory, gender, labour and environmental problems in the broader historical, social and institutional context in which a value chain is embedded (Riisgaard et al. 2010). Downstream value chain actors – traders, retailers, and customers – are especially interested in the price, convenience, and health qualities of the product, yet their concerns for environmental sustainability and fishing community wellbeing are low or absent. In fact, the upstream value chain actors – fishers, small curers, and dried fish workers – are often challenged by factors such as the lack of quality control measures, poor market information, and lack of power in the market (Schuurhuizen et al. 2006; De Silva 2011). Trade investment in fishing and fish processing is accentuating the problems of overfishing, loss of traditional jobs, and lack of added value for the local

population (Schuurhuizen et al. 2006).

Feedback from changes in fishing practices

The mean annual increase in marine production from 2008 to 2019 in Odisha was 1.14 percent, with a standard deviation of 0.14. At the same time, there was a strong intensification of fishing in coastal areas. For example, over this period, the number of motorized boats increased by 297 percent in the state (GoO). The gear used by these vessels have also undergone major changes, emphasizing small pelagic species catch across the mechanized, motorized, and non-mechanized sectors (Devadasan & Boopendranath 2009). Data from the study village also suggests that about 75 percent of the households have upgraded their fishing gear and boats to higher capacity with the intention of covering more fishing territory, increasing both catch volume and the range of fish species caught. Bycatch has grown significantly. The major reasons for increased bycatch include prolonged fishing trips with improved capacity (up to 40 tons), emerging markets for bycatch as fish and poultry feed and fertiliser, and lack of enforcement that has led to Indian and foreign trawlers (e.g., Bangladesh) trespassing into the 5 km artisanal fisheries area reserved for the non-mechanized sector. The estimated volume of illegal catch in the artisanal fisheries area along the Odisha coast alone is between 2,100 and 4,100 tons per annum (Pramod 2010; Pramod & Pitcher 2019).



Figure 3. A fisher from Kajalpatia village, Jagatsinghpur, Odisha. Credit: Authors

There have also been significant changes in the operational practices in the production node. Ninety-four percent of dried fish processors in the study village are either individual or household enterprises or hire fewer than three labourers for their operations. Increasing wage rates and reduced catch per unit effort (CPUE) have changed the labour arrangements for boat trips. Many fishers are now forging partnership with others and sharing boats. In some cases, women are joining their spouses on the boats. In addition to fishing, most of these household enterprises also depend on the 'C' class fish landings by trawler owners and the semi-processed fish from the trawler crews. There is a strong motivation among crew members to produce dried fish as they get a 90 percent share of any fish dried on the boat. However, the availability of 'C' class fish is declining due to several factors. With greater vessel capacity and better refrigeration on vessels, there is growing intake small pelagic species for the local fresh and frozen fish market. At the same time, the emerging fish and animal feed market is creating bulk demand for ungraded, unprocessed bycatch. The geographic separation of landing of dried fish species has been blurred with greater collaboration among trawler owners and an emerging market at sea: for example, trawlers from South

India have been buying trash fish at sea to supply the booming feed markets at home.



Figure 4. Neheru Bangala, Paradeep fish landing site. Credit: Authors

One estimate suggests that about 56 percent to 93 percent of trawler catch is bycatch (Gupta et al. 2019). As a result the coast is experiencing intensive trawling to maximize catch with little care for size of fish, harvesting of juveniles, or the health of the fisheries ecosystem (Lobo et al. 2010; Dineshbabu et al. 2013; Gupta et al. 2019). At the same time, there is decreased availability of low value fish to small-scale fishers and dried fish processors due to the transgression of maritime fishing zones, increased species mobility, and competition from trawling. All respondents from the household survey confirmed that there has been a significant decline in fish catch per unit as a result of increased competition, intrusion of mechanized vessels, coastal pollution, and siltation of Mahanadi sea mouth.

Uncertainties emerging from legal, political, and natural environments

The number of legal fishing days has decreased due to a winter fishing ban in Bhitarkanika marine protected area, an international fishing ban in the territorial waters, and the increased frequency of extreme weather events over the last two decades. However, these conservation measures have not produced desired results as trawlers from other states are straying into the EEZ during the fishing ban period. Secondly, during the post-ban period, there has been a rush to catch whatever fish is available. Often the quantity of small pelagic catch is higher than the large, high-value fish captured during this period. To cope with economic stress, all households in the village have started processing small fish both for human consumption and for animal feed.



Figure 5. Processing facility, Paradeep, Jagatsinghpur. Credit: Authors

A greater number of people have joined the processing activities. However, the scale of production at the household level remains very low. Eighty-

nine percent of households are operating at a scale which is not viable for supplying to distant markets such as Paradeep, where the price can be about 20 to 30 percent higher than what may be obtained locally. Fishers and small-scale dried fish processors mostly depend on the local aggregators and commission agents from Kanthi, West Bengal who procure small amounts of dried fish from their doorsteps. A small number of dried fish operators sell their produce in Paradeep through commission agents at the rate of Rs 500/- per quintal, which is about 10 percent of the total sale revenue. Although the commission is high, dried fish processors prefer working with them as they get cash advances and other support during emergencies. Therefore, the small producers value these relationships more than the financial return and, in most cases, they sell their products through specific commission agents.



Figure 6. Processing facility, Kajalpatia, Jagatsinghpur. Credit: Authors

The other limiting factor is their inability to compete with other states due to lack of infrastructure to maintain hygienic conditions of dried fish and, in some cases, the natural colour of the dried fish. A majority of the community members in Kajalpatia village said that despite growing hardships

and challenges, they would like to continue with these activities as they do not have other livelihood options outside fisheries. They feel that they have adequate knowledge and skill and draw a high level of satisfaction by producing good quality dried fish for human consumption. However, due to the growing hardships and uncertainties of artisanal fisheries, many young men have started to work as crew on the trawlers, workers in the shrimp aquaculture farms, or migrant labourers in urban areas.

Connections and collaborations with complex community and trade interactions

Fishers and local dried fish processors also view the relationship between dried fish operations and a continually changing fisheries system in adaptive terms. They consider dried fish operations as a means to reduce stress on household income and enhance life satisfaction. Despite reported declining incomes and higher levels of stress, demographic trends among households in the study village show that communities continue to welcome their relatives from West Bengal and coastal Odisha. Households place higher value on social-cultural networks in the context of growing uncertainty and stress. They also believe that with a greater number of fishing families, they can build a stronger identity and gain better access to political leadership.

However, downstream value chain actors such as traders, trawler owners and commission agents perceive the current situation of uncertainty and change as an opportunity to diversify their trade portfolios by building interstate business relations and tapping new opportunities. New avenues are opening with growing emphasis on and investment in culture fisheries, the poultry industry, and a higher degree of product mobility across regions, aided by a favourable tax regime that exempts dried fish from the Goods and Service Tax (GST).

Evidently, the interactions of fishers and processors with economic agents in the trading, wholesaling, and retailing nodes of the value chain are neither entirely financial nor linear. With growing uncertainty in production, supply

chain dynamics have undergone changes. As fishers become more dependent on local aggregators and commission agents due to low production volumes, traders and aggregators are also adapting their operations in response to uncertainty in the flow of products.

The traders from the study area provided an interesting picture of trade practices across different value chains. Interactions are becoming increasingly complex, with growing unpredictability of product availability and greater mobility of products across the region due to better transportation infrastructure. In some places, trade practices have also been strongly influenced by the higher levels of competition for space among the trade agents from different states. Previously, traders worked with agents at the community level who were able to ensure supply of a variety of species of dried fish from specific locations. Now, their local advantage is being weakened with changes in fish stocks, increasing trade at sea, changing BOM structure due to the more widespread availability of ice, demand for fresh fish in local markets, and emphasis on frozen fish and bulk sourcing by feed industries.

Local traders and wholesalers have diversified their input sourcing and marketing options by targeting commission agents at the community level and traders from Odisha, West Bengal, and Eastern Andhra Pradesh at weekly wholesale markets. In cases where prices are low at local markets, these actors may seek a higher price at wholesale weekly markets. Usually, supply chain losses are 20 to 30 percent for traders due to poor moisture control, spoilage, and weather fluctuations. But now they are finding new markets in the feed industries for product that would previously have gone to waste. Hence trade interactions are highly dynamic across the value chain nodes. There is also a greater consolidation at the trading node as traders are specializing or entering new business arrangements that may focus on feed, frozen fish, or other marine products.

Dried fish value chain performance: A contested perspective

Value chain performance from a conventional, neoclassical perspective focuses on value addition across the value stream, with management importance assigned to individual actors and nodes in the chain, and interactions perceived as structured in a vertical manner. This conventional model suggests that value chain efficiency can be achieved by bringing in management and technological changes, along with the introduction of complementary market processes and networks among market players. Upgrading plays a role in value creation (Kaplinsky 2000) either through improvements in quality and product design or by diversification in the product lines served, which is generally achieved through skill enhancement and technology (Attaie & Fourcadet 2003; Rosales et al. 2017). Efficiency can be achieved by bringing management and technological improvements to the midstream (processing, value chain diversification, supply chain efficiency) and downstream levels (forging complementary market networks among market players), with or without considering upstream issues (fishers and dried fish workers).

In the case of ecological resources like dried fish, feedback mechanisms that operate across scales are often non-linear and involve interactions that are dynamic and iterative in nature (Pradhan et al. 2022a). It is evident from the study site that feedback from fisheries is quite diverse and has direct implications for dried fish operations, which are generally household level enterprises. Value chain complexities and challenges have increased for people involved in the upstream segment of the dried fish value chain, influenced by changes in the fishing sector such as the increase in aquaculture and frozen fish production, intensive and prolonged fishing trips by motorized and mechanized vessels, conservation actions, industrial pollution, the increased frequency of severe weather events, and migration. The export scenario for dried fish is also not promising in comparison to frozen shrimp and frozen fish. Export data from Odisha suggest that the percentage revenue share for dried fish out of total fish and fish product

exports has remained low, with a mean value of 2.1 percent between 2005 to 2018, whereas the corresponding data for frozen shrimp and frozen fish is 56.35 percent and 15.3 percent respectively for the same period.

Our data also suggest that despite a dwindling fish catch and greater economic stress, families in the study village continue to welcome relatives from other places to come and settle net to them. Amidst growing uncertainty and risk, immigrants value relationships more than financial return. One respondent told us that since they are not one of the original inhabitants of the area and have relatively less access to political and financial institutions, social relationships provide the strongest mechanism to deal with natural, political, and economic adversities. At the same time, women have started to play a greater role in the market. Women also obtain priority support from government and non-government initiatives (see also Galappaththi et al. 2021). Ecological and economic stresses are pushing youth to take up work both within fisheries and non-fisheries sectors. People in Kajalpatia place a higher importance on social ties for viability of operation so that they can share labour, resources and build family ties among themselves.



Figure 7. Sunakhala Market, Odisha. Credit: Authors

When asked, traders offered a different perspective on value chain performance. Eighty percent of surveyed traders emphasized the need for quality production, maintaining better hygienic conditions, minimizing waste, and opening new business opportunities as key actions to influence prices and markets. At the same time, traders also place high importance on relationships with local shopkeepers and vendors. They report that market price fluctuations are very high, for example, but they cannot transfer all their costs to their clients as they worry that doing so would threaten their customer base, leading them to sell product at cost in some cases. If they face making a loss on a sale, they will inform their clients and advise them to wait for few days if possible until the new stock arrives. Hence the value chain interaction and performance criteria are varied for different actors in the value chain operating both in upstream and downstream segments. Value chain performance is perceived as social-ecological wellbeing, which is beyond revenue both in material and non-material terms. Its value is seen in terms of social capital, social power, influence, public image, belongingness, confirming to social and cultural ties, and recognizing community values.

SES-oriented dried fish value chain: A novel perspective

In contrast to conventional dried fish value chain analysis, it is prudent to consider the biophysical resource as critical and internal to the value stream in a dried fish value chain, beyond simply assigning it a role of providing enabling environment for inbound logistics functions. Such a model has the potential to place the priorities of concerns of upstream actors, including fishers and small-scale dried fish processors, and elevate their value chain decision-making role (Pradhan et al. 2022a). The upstream actors often have overlapping roles as fishers, dried fish processors, and even local traders. Actor and biophysical resource complexities in the upstream value chain segment can be better analysed by understanding system attributes in the SES-oriented value chain and the horizontal and vertical linkages across chain segments. Analysis of SES attributes such as feedback, linkages, uncertainties, and emergence, with clear understanding of

subsystems and different parameters associated with these attributes, offers a novel perspective that enables a more inclusive value chain perspective (Pradhan et al. 2022a). SES attributes also provide a comprehensive place-based understanding of both horizontal and vertical interactions across value chain nodes.

The dynamic interplay of SES attributes, variables, and their expression vis-à-vis the structure, conduct, and performance indicators in the dried fish value chain offer a strong departure from a conventional value chain perspective. The conventional approach is heavily reliant on technological innovations in relation to time and space, focuses on aggregate financial value creation across nodes, and is not designed to anticipate surprises. However, an SES-oriented dried fish value chain places greater emphasis on wellbeing of the resource base and the actors, particularly in the upstream segments of the value chain. It can help rebalance the power in the market towards upstream value chain actors for the promotion of inclusive dried fish value chain interventions.

References

- Adger, W. Neil. 2006. 'Vulnerability.' *Global Environmental Change*, 16, no. 3: 268-281. <https://doi.org/10.1016/j.gloenvcha.2006.02.006>.
- Altenburg, Tilman. 2007. *Donor approaches to supporting pro-poor value chains*. 61.
- Attaie, Hila, and Oliver Fourcadet. 2003. *Agricultural Support System Division*.
- Baglioni, Elena, and Liam Campling. 2017. 'Natural Resource Industries as Global Value Chains: Frontiers, Fetishism, Labour and the State.' *Environment and Planning A: Economy and Space* 49, no. 11: 2437-2456. <https://doi.org/10.1177/0308518X17728517>.
- Balachandran, K. K. n.d. 2001. *Post-harvest technology of fish and fish products*.

Daya Books.

Belton, Ben, Derek Johnson, Eric Thrift, Jonah Olsen, Mostafa Ali Reza Hossain and Shakuntala Haraksingh Thilsted. 2022. 'Dried Fish at the Intersection of Food Science, Economy, and Culture: A Global Survey.' *Fish and Fisheries*, no. 12664. <https://doi.org/10.1111/faf.12664>.

Béné, Cristophe, Rebecca Lawton and Edward H. Allison. 2010. 'Trade Matters in the Fight Against Poverty: Narratives, Perceptions, and (Lack of) Evidence in the Case of Fish Trade in Africa.' *World Development* 38, no. 7: 933-954. <https://doi.org/10.1016/j.worlddev.2009.12.010>.

Berkes, Fikret, Johan Colding, and Carl Folke. Eds. 2003. *Navigating social-ecological systems: Building resilience for complexity and change*. Cambridge University Press.

Brueckner-Irwin, Irene, Derek Armitage, and Simon Courtenay. 2029. 'Applying a Social-Ecological Well-Being Approach to Enhance Opportunities for Marine Protected Area Governance.' *Ecology and Society* 24, no. 3: art7. <https://doi.org/10.5751/ES-10995-240307>.

Creswell, John W., and J. David Creswell. 2017. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.

De Silva, D. Achini M. 2011. 'Value chain of fish and fishery products: Origin, functions and application in developed and developing country markets.' *Food and Agriculture Organization*, 1-53.

Demeritt, David. 1994. 'The Nature of Metaphors in Cultural Geography and Environmental History.' *Progress in Human Geography* 18, no. 2: 163-185. <https://doi.org/10.1177/030913259401800203>.

Devadasan, K., and Boopendranath, M. R. 2009. 'Fishing Craft and Gear for Small Pelagics.' 7-8.

Dey, Madan Mohan, and World Fish Center Eds. 2008. *Strategies and options for increasing and sustaining fisheries and aquaculture production to benefit poorer households in Asia*. World Fish Center.

Dineshababu, A. P., Radhakrishnan, E. V., Sujitha Thomas, Maheswarudu, G., P.P Manojkumar, Kizhakudan, S. J., S. Lakshimi Pillai, Rekhadevi Chakraborty, Jose Josileen, Sarada, P. T., Sawant, P. B., Philipose, K. K., Deshmukh, V. D., Jayasankar, J., Ghosh, S., Mohamed Koya, G.B Purushottama and Gyanarankan Dash. 2013. 'Appraisal of trawl fisheries of India with special reference on the changing trends in bycatch utilization.' *Journal of the Marine Biological Association of India* 55, no. 2: 69–78.

Ericksen, Polly J. 2008. 'Conceptualizing Food Systems for Global Environmental Change Research.' *Global Environmental Change* 18, no. 1: 234–245. <https://doi.org/10.1016/j.gloenvcha.2007.09.002>.

Fabinyi, Michael, Wolfram H. Dressler and Michael D. Pido. 2018a. 'Moving Beyond Financial Value in Seafood Commodity Chains.' *Marine Policy* 94. 89–92. <https://doi.org/10.1016/j.marpol.2018.04.033>.

Fabinyi, Michael, Wolfram H. Dressler and Michael D. Pido. 2018b. 'Moving Beyond Financial Value in Seafood Commodity Chains.' *Marine Policy* 94. 89–92. <https://doi.org/10.1016/j.marpol.2018.04.033>.

Ferguson, Caroline. E., Nathan J. Bennett, William Kostka, Robert H. Richmond and Ann Singeo. 2022. 'The Tragedy of the Commodity is not Inevitable: Indigenous Resistance Prevents High-Value Fisheries Collapse in the Pacific Islands.' *Global Environmental Change* 73, no. 102477. <https://doi.org/10.1016/j.gloenvcha.2022.102477>.

Gereffi, Gary, John Humphrey, and Timothy Sturgeon (2005). 'The Governance of Global Value Chains.' *Review of International Political Economy* 12, no. 1: 78–104. <https://doi.org/10.1080/09692290500049805>.

GoI. 2020. *Handbook on Fisheries Statistics*. Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India. https://dof.gov.in/sites/default/files/2021-02/Final_Book.pdf.

GoO. 2022. Fisheries Statistics. Government of Odisha. <https://odishafisheries.nic.in/?p=report&type=11>.

Gupta, Trisha, Marianne Manuel, Muralidharan Manoharakrishnan, Naveen Namboothri and Kartik Shanker. 2019. 'Conservation and Livelihood Implications of Trawler Bycatch: Towards Improved Management.' *J. Govern* 19. 55–63.

Harrison, Helena, Melanie Birks, Richard Franklin and Jane E. Mills. 2017. 'Case Study Research: Foundations and Methodological Orientations.' *Forum: Qualitative Social Research* 18, no. 1. <https://doi.org/10.17169/FQS-18.1.2655>.

Jentoft, Svein. 2000. 'The Community: A Missing Link of Fisheries Management.' *Marine Policy* 24, no. 1: 53–60. [https://doi.org/10.1016/S0308-597X\(99\)00009-3](https://doi.org/10.1016/S0308-597X(99)00009-3).

Johnson, Derek. 2018. *Social well-being and the values of small-scale fisheries*. Springer International Publishing.

Kaplinsky, Raphael. 2000. 'Globalisation and Unequalisation: What Can Be Learned from Value Chain Analysis?' *Journal of Development Studies* 37, no. 2.: 117–146. <https://doi.org/10.1080/713600071>.

Kaplinsky, Raphael and Mike Morris. 2000. *A Handbook For Value Chain Research*. University of Sussex, Institute of Development Studies.

Lobo, V., Patil, A., Phatak, A., and Chandra, N. 2010. 'Free Radicals, Antioxidants and Functional Foods: Impact on Human Health.' *Pharmacognosy*

Reviews 4, no. 8: 118. <https://doi.org/10.4103/0973-7847.70902>.

Lowitt, Kristen, Gordon M. Hickey, Wayne Ganpat and Leroy Phillip. 2015. 'Linking Communities of Practice with Value Chain Development in Smallholder Farming Systems.' *World Development* 74, 363–373. <https://doi.org/10.1016/j.worlddev.2015.05.014>.

Marshall, Graham R. 2015. 'A Social-Ecological Systems Framework for Food Systems Research: Accommodating Transformation Systems and their Products.' *International Journal of the Commons* 9, no. 2.: 881. <https://doi.org/10.18352/ijc.587>.

Merchant, Carolyn. 1987. 'The Theoretical Structure of Ecological Revolutions.' *Environmental Review* 11, no. 4: 265–274. <https://doi.org/10.2307/3984135>.

Merriam, Sharan B. and Elizabeth J. Tisdell. 2015. *Qualitative Research: A Guide to Design and Implementation (Fourth Edition)*. John Wiley and Sons.

Mitchell, Jonathan, Christopher Coles and Jodie Keane. 'Trading Up: How a Value Chain Approach Can Benefit the Rural Poor.' (2009): 94.

Nayak, Prateep Kumar and Fikret Berkes. 2011. 'Commonisation and Decommunisation: Understanding the Processes of Change in the Chilika Lagoon, India.' *Conservation and Society* 9, no. 2: 132. <https://doi.org/10.4103/0972-4923.83723>.

Payra, Pijush, Riyanka Maity, Swaraj Maity and Basudev Mandal. 2018. 'Production and Marketing of Dry Fish through the Traditional Practices in West Bengal Coast: Problems and Prospect.' <https://doi.org/10.20546/ijcma.s.2018.710.401>.

Pradhan, Sisir Kanta, Prateep Kumar Nayak and Derel Armitage. 2022a. 'A

Social-Ecological Systems Perspective on Dried Fish Value Chains.' *Current Research in Environmental Sustainability* 4, no. 100128. <https://doi.org/10.1016/j.crsust.2022.100128>.

Pradhan, Sisir Kanta, Prateep Kumar Nayak and Derek Armitage. 2022b. 'A Social-Ecological Systems Perspective on Dried Fish Value Chains.' *Current Research in Environmental Sustainability* 4, no. 100128. <https://doi.org/10.1016/j.crsust.2022.100128>.

Pramod, Ganapathiraju. 2010. *Illegal: Unreported and Unregulated Marine Fish Catches in the Indian Exclusive Economic Zone*. Field Report, no. 29.

Pramod, Ganapathiraju and Johny J. Pitcher. 2019. 'In Defence of Seafood Import Analysis: Credulity Bamboozled by Supply Chain Laundering.' *Marine Policy* 108, no. 103651. <https://doi.org/10.1016/j.marpol.2019.103651>.

Reardon, Thomas, Kevin Z. Chen, Bart Miten and Lourdes Adriano. 2012. *The Quiet Revolution in Staple Food Value Chains Enter the Dragon, the Elephant, and the Tiger*. Asian Development Bank and International Food Policy Research Institute.

Riisgaard, Lone, Simon Bolwig, Stefano Ponte, Andries Du Toit, Niels Halberg and F. Matose. 2010. 'Integrating Poverty and Environmental Concerns into Value-Chain Analysis: A Strategic Framework and Practical Guide.' *Development Policy Review* 28, no. 2:195–216. <https://doi.org/10.1111/j.1467-7679.2010.00481.x>

Rosales, Rina Maria, Robert Pomeroy, Ina Judith Calabio, Mabel Batong, Cedo, Kimakarla Cedo, Nestor Escara, Vivien Facunla, Anecita Gulayan, Manuel Narvadez, Madzni Sarahadil and Maria Aimee Sobrevega. 2017. 'Value Chain Analysis and Small-Scale Fisheries Management.' *Marine Policy* 83: 11–21. <https://doi.org/10.1016/j.marpol.2017.05.023>.

Ruddle, Kenneth and Naomichi Ishige. 2010. *On the Origins, Diffusion and Cultural Context of Fermented Fish Products in Southeast Asia*. 18.

Schuurhuizen, Ronald, Aad Van Tilburg and Emma Kambebwa. 2006. *Fish in Kenya: The Nile-Perch Chain* in.

Schuurhuizen, R., van Tilburg, A., & Kambebwa, E. (2006). Fish in Kenya: The Nile-perch chain in. In R. Ruben, M. Slingerland, & H. Nijhoff (Eds.), *Agro-food chains and networks for development: Issues, approaches and strategies*.

Siddhnath, Amit Ranjan, Bimal Prasanna Mohanty, Pooja Saklani, Krushna Chandra Dora and Supratim Chowdhury. 2020. 'Dry Fish and Its Contribution Towards Food and Nutritional Security.' *Food Reviews International*. (2020): 1–29. <https://doi.org/10.1080/87559129.2020.1737708>.

Thilsted, Shakuntala Haraksingh, David James, Jogeir Toppe, Rohana Subasinghe and Idda Karunasagar. 2014. *Maximizing the Contribution of Fish to Human Nutrition*. 16.

Webster, Janet G. and Jean Collins, J. 2005. *Fisheries Information in Developing Countries: Support to the Implementation of the 1995 FAO Code of Conduct for Responsible Fisheries*.

Worster, Donald. 1988. *Doing Environmental History. The Ends of the Earth: Perspectives on Modern Environmental History*. 292.

Yin, Robert K. 2014. *Discovering the Future of the Case Study: Method in Evaluation Research*. 8.

25. Examining Value From a Socio-cultural Perspective

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Summary

This essay examines value from a socio-cultural perspective, deriving insights from existing value literature in anthropology, social science, development studies, human geography and critical literature on global value chains. It problematizes the market economy's narrow, individualistic and disembedded value perspective by focusing on the relationality and positionality of value. The money-centric valuation system builds on neo-classical economic principles, pays attention only to capitalist economic relations and their economic value and is insensitive to non-economic relations and value. The existing valuation system built on this narrow understanding is partial and misleading; it fails to capture the actual value of a thing. This essay argues for a critical value perspective that is inclusive, sensitive to value heterogeneity, and attentive to all types of economic and social relations that produce value.

Introduction

Scholars from diverse disciplines explain the concept of value in different ways. The market economy is the dominant value reference point today. Value in the market economy is defined primarily from the neoclassical economic perspective that finds value not in the commodity or in the relations through which it produces, rather in its marginal utility, how much it satisfies the consumer at the time of exchange (Frisch 1950; Taylor 2001). This individualistic approach to value moved the focus of economic analysis of value from the study of the social relations of production (Smith 1776 [2003]; Marx 1867 [1976]) to the study of individual choice (Foley 1999). The subjective preferences of individuals have become the primary focus of economic analysis to value, which has been dominant until today.

In contrast to the universal, individualistic value theory in economics, several disciplines, such as anthropology, human geography, and feminist studies, understand the concept of value in its many particular forms. A vast wealth of studies reveals that value is conceptualized and used in diverse ways worldwide. Anthropology has a long history of studying value in non-capitalist societies. Since the beginning of the discipline, anthropologists have focused on unearthing the diversity of value, exchange systems, and economic systems (Polanyi 1944; Mauss 1974 [1925]; Gregory 1982; Greaber 2013). Anthropological evidence reveals that value is embedded in social relations and is always negotiated and co-constructed. The embeddedness and fluidity of value indicate the existence of multiple values and ways of valuing (Johnson et al. 2018). It is essential to acknowledge and recognize that there are multiple values, valuers, and valuing systems, and each of them is significant and is not reducible to others.

Understanding the dominant economic explanation of value is essential before discussing the socio-cultural perspective of value. Therefore, the essay briefly examines economic thinking about value in the first section before reviewing the existing literature studying value from a socio-cultural perspective.

Value concept in economics

Value is one of the most discussed concepts in economics. For centuries, scholars and theorists have explained the concept of value from various perspectives. There are broadly two perspectives on value in economics: classical and neo-classical. Classical value theory found value in production, while neoclassical theory looked for value in the market. According to classical value theory, the value of a commodity is the socially necessary labour expended to produce it. In neoclassical theory, value depends on its marginal utility, how much it satisfies the consumer. The neoclassical explanation of value moves the focus of analysis from the social relations of production to individual choice. The following section briefly narrates the classical and neo-classical views of value.

The classical economic school originated in the late eighteenth century with Adam Smith and was developed by David Ricardo and Karl Marx. In his masterpiece, *Inquiry into the Nature and Causes of the Wealth of Nations* (1776 [2003]), Adam Smith first attempts to answer the question of value in his labour theory of value. His theory of value developed on labour, and it asserts that the relative value of commodities depends on the relative amount of labour needed to produce them (Smith 1776 [2003]). For him, labour directly involved in producing a commodity and the labour expended in the labour process, creates the real value of things. However, the value of commodities explained in Smith's labour theory of value was based on an 'early and rude state' in which the whole commodity belongs to the labourer (Smith 1776 [2003], p. 68). It falls short of explaining the real value of commodities in a society with settled agriculture and industry where the price of commodities does not solely depend on labour but also the means of production and rent (Foley 1999). Smith then switched his position and replaced his earlier theory with the 'adding up' theory of value, which recognizes wages, rent, and profit as three primary sources of value (Foley 1999). According to the 'adding up' idea, the value of any commodity is equal to the sum of wages, rent, and profit of the workers, landowners, and capitalists who participated in its production (Foley 1999, p. 21). Smith's theory of value brought the question of value to

the center of economic studies and paved the way for further discussion.

David Ricardo (1821[2001]) takes forward Adam Smith's (1776) 'labour embodied' theory of value, and with some correction, applies it to class society. Ricardo agrees with Smith that utility does not determine a commodity's value (Ricardo 1821 [2001], p. 8-9); instead, value derives from the labour embodied in production. He mentions that the labour directly engaged in commodity production and the labour invested in developing the skills and tools for production determine a commodity's value (Ricardo 1821 [2001]). He argues that wages may rise or fall based on the quality of labour, and any changes in wages will affect the profit but not change the quantity of labour. Since there is no change in the amount of labour, there will be no change in value (Taylor 2001). The most significant contribution of Ricardo's labour theory of value is its application to class society.

Karl Marx (1867 [1976]) adopted and advanced the labour theory of value in several key ways, further explaining and adding new ideas such as exchange value. Like Ricardo, Marx's theory of value-centred on labour. He argues that not all labour creates value, but only abstract as opposed to concrete, social as opposed to private, and necessary as opposed to unnecessary labour (Taylor 2001). Abstract labour is a kind of labour that is part of the total labour of society and engaged in particular productive tasks, thus, producing use-value (Marx 1867 [1976]). In a commodity-producing society, all labour involved in production has another type of value, i.e., exchange value. Another aspect of Marx's labour theory of value is that it only counts the labour performed at the societal level and produces exchange value. Labour performed at a private level (e.g., household works) is not counted because it has no exchange value. A commodity's exchange value is determined by the amount of social labour necessary to produce it (Taylor 2001). Then, the question is how value is expressed? According to Marx, the value of commodities is expressed through price (Marx 1865 [2000]). Price (money) is the monetary expression of value. It gives the value of all commodities an independent and homogenous form and makes the quantitative valuation of commodities possible.

In sum, despite differences, classical economists share some significant points in their approach to value. First, all classical economists search for

value at the level of production. Second, all of them agreed that the value of a commodity is determined by the socially necessary labour required to produce it.

The neo-classical explanation of value moves the focus of economic analysis of value from the study of the social relations of production (Smith 1776 [2003]; Marx 1867 [1976] to the study of individual choice (Foley 1999). As of today, the primary focus of economic analysis is individual's subjective preferences. William Jevons, Carl Mengers, Leon Walras, and Alfred Marshall are prominent economists known as neo-classical theorists. William Jevons and Carl Mengers developed a new analytical tool, called marginal utility theory, in 1871 to explain value. According to neo-classical thought, the value of a commodity depends solely on utility rather than the production orientation of classical theory. Marginal utility theory sees the determinants of value at the market and at the time of exchange. Here value is determined entirely by the utility of the commodity (Taylor 2001). Utility is a commodity's ability to generate pleasure or hinder discomfort. Marginal utility theory shifted its focus to individuals (consumers) with the concept of utility (Hoyo & Madariaga 2016). Thus value becomes subjective since the subjective assessment of consumers determines it.

Early marginal utility theory was partial; it considered only the demand side of the commodity while measuring value. Proponents of marginal utility theory argue that demand based on marginal utility determines the value of a commodity. Alfred Marshall (1920) proposed a value theory, popularly known as partial equilibrium theory, which first explains the value in terms of supply and demand. His theory also emphasizes the role of margin. According to Marshall (1920), value is determined by the forces of supply and demand at the margin. Another significant contribution of Alfred Marshall to value theory is introducing the time element in the economic analysis of value. Changes in time effect value (Frisch 1950). In short, the neoclassical theory of value believes that a commodity's value does not depend on the labour expended in its production or in any inherent property of the commodity. Rather it depends on its marginal utility, how much it satisfies the consumer.

Socio-cultural perspectives on value

In contrast to the universal, individualistic value theory in economics, anthropologists understand the concept of value in its many particular forms. Economic anthropology has a long history of studying the values and economic systems of non-capitalist societies worldwide. The most significant contribution of earlier economic anthropologists and anthropology as a discipline to the value discussion is that value is embedded in a particular context. Karl Polanyi (1944), the pioneer in economic anthropology, referring to rich ethnographic evidence on economy, culture and society in non-Western societies, argues that all economies, except the market economy, are embedded and enmeshed in social relations and institutions. Examining the emergence and development of England's market economy, he claimed that the market economy is disembedded and underpins maximization and rational behaviour principles that distinguish it from other economies. Polanyi's (1944) contribution is to show that economy is a part of broader society, and a fuller understanding of the economy and economic activities requires studying it in its particular context, and connecting it with the social.

Several prominent anthropologists have shown the embeddedness and cultural specificity of value. Bronislaw Malinowski (1922), Marcel Mauss (1925 [1974]), and Lévi Strauss (1949 [1969]) were pioneers in studying the economic system, more specifically, the exchange system in non-European societies. Malinowski's (1922) observations on value arose out of his comparative analysis of Trobriand society and the economy. Ceremonies played the role of exchange in 'primitive societies' like Trobriand and institutionalized the value ascribed to objects. Marcel Mauss was the first anthropologist who provided an in-depth anthropological analysis of the non-market exchange system. In his masterwork, *The Gift*, Mauss (1925 [1974]) analyzed the gift economy in Polynesia. His particular focus was on the modes of exchanging things. Contrary to the belief of orthodox economists that exchange economies only exist in market economies, Mauss shows the existence of exchange economies in non-capitalist societies in Polynesia. However, it was different from what Europeans were familiar with (Gregory

1982). He called this particular system of production and exchanges a ‘gift economy’. In *Gifts and Commodities*, Chris Gregory (1982) reaffirmed the coexistence of gifts and commodities in colonial Papua New Guinea. In the gift economy, the individual does not have alienable rights over things, as we see in capitalism. Therefore, the exchanged things are never wholly separated from the person who gives the gift (Mauss 1925 [1974]). Instead, the exchange established a relationship between the giver and receiver by binding the recipient to the social norm of returning a gift. In contrast to the single sphere of exchange in a capitalist economy, the gift economy has multiple spheres (Gregory 1982). Thus, a single object can be recognized as a gift and commodity depending upon the specific context of the exchange. The market economy is not the only exchange system in the world, but one of many, and every exchange system has its own ethics, language, and valuation system (Widlock 2013). It will be deceptive if we judge one type of exchange with another. Therefore, value theory must consider the ethics of exchange to better understand value and value formation (Otto & Willerslev 2013).

The embeddedness of value indicates another critical aspect of it, i.e., relationality. A commodity derives its meaning and value through its relationships with the people and environment in which it is produced (Johnson 2018; Thompson 1991). Now the question is how value is produced? To answer this question, I want to refer to David Graeber. As Graeber cited, “*Value emerges in action; it is the process by which a person’s invisible potency – their capacity to act – is transformed into concrete, perceptible form*” (Graeber 2001, p. 45). By actions, Graeber refers to all human creative activities which get value through recognition from society, where society is conceived as fluid and a process, not as static. As Graeber concluded, “*Insofar as value is social, it is always a comparison; value can only be realized in other people’s eyes*” (Graeber 2013, p. 226). Hence, value can only be realized when it is connected to social and relational aspects. Therefore, any economic model that focuses solely on individuals fails to recognize a thing’s real values. A deeper understanding of value and value formation requires an in-depth knowledge of the relations in which it is produced, exchanged, and consumed (Otto Willersley 2013; Acott et al. 2018).

What people value and the degree to which they value something depends on the valuer's identity and social context (Gregory 1997; Song 2018). Critical feminist ideas (Hancock 2013) further complicate the understanding and assessment of value. They argue that diverse social factors such as class, gender, race, caste, and religion profoundly influence value perceptions. Further, they indicate that the conception of value varies between individuals and cultures and over time. The positionality of value indicates that there could be more than one value in a particular economy and time. Unlike the monist theory of value in economics, anthropological value theory conceptualizes value in the plural; it argues for values, not value. Ethnographic evidence (Griffith & Pizzini 2002; Tsing 2015; Kim et al. 2018) highlights the essential roles of non-economic values, e.g., social, cultural, and ecological. Critical fishery studies (Urquhart & Acott 2014; Islam & Chuenpagdee 2018; Johnson et al. 2018) also reveal multi-dimensional values. To many fishers, fishing is more than an income source. Fishing is at the core of their identities; through their activities, they maintain and reproduce their culture (Ginkel 2009); it is not just an occupation but a way of life (De Silva 2011; Sharma 2011; Biswal 2017). Therefore, valuing a thing only by its economic value is partial and misleading; a complete valuation requires recognizing and valuing both economic and non-economic value.



Figure 1. a) Top Left: Child labour in a dried fish processing unit in Cox's Bazar. b) Top Right: Women labourers in a dried fish processing unit in Cox's Bazar. c) Bottom Left: Women labourers pack dried fish for export. d) Bottom Right: Fish are dried in the household by fisherwomen. Credit: Md. Mahfuzar Rahman

The fisheries literature further complicates discussions of value and questions the dominant money-centric value perspective of the market economy (De Silva 2011; Dunaway 2013; Ruddle & Davis 2013). Small indigenous fish in Bangladesh is an excellent source of micronutrients such as zinc, calcium, iron, vitamins A and B12, fatty acids and animal protein, but they are typically low in economic value. For example, *mola* (*Amblypharyngodon mola*), a small indigenous fish in Bangladesh, contains around fifteen times higher Vitamin A content than large fish like silver carp (*Hypophthalmichthys molitrix*), grass carp (*Ctenopharyngodon idella*), and hilsha (*Tenualosa ilisha*), the most expensive indigenous fish species in Bangladesh (Ross et al. 2003). Both fresh and dried fish carry high ethnomedicinal value in several cultures across the world for their critical roles in preventing and curing nutrient deficiencies, eye diseases, asthma, coronary diseases, and low birth weight, among others (Prabhakar & Roy 2009; Deb & Haque 2011; Vallejo & Gonzalez 2014; Rajani & Alka 2015). For example, *shoal* (*Channa striatus*), an indigenous freshwater fish typically found in South Asia, using by local people in wound

healing and post-operative pain. Indigenous communities in the hill areas in southeastern Bangladesh use fermented shrimp paste, locally known as *nappi*, to cure malaria (Deb & Haque 2011). Dried *loitta* (*Harpodon nehereus*) is also commonly used in coastal Bangladesh for post-maternity disorders and increasing milk in breastfeeding mothers. These examples highlight that monetary value does not always represent a thing's real value or importance.

Some fish are more important than their taste, smell and nutritional value in many areas across the world and, sometimes, a fish becomes part of the identity of a nation and state (De Silva 2011). For example, *hilsha*, an indigenous freshwater fish in Bangladesh, became the national fish after independence and a core aspect of Bengali identity. *hilsha* is an integral part of festivals and ceremonies of Bengalis living in Bangladesh and India. Bangladeshi *hilsha*, especially caught in the Padma River, has high demand in West Bengal, India, for its unique taste and smell. Hindu families who moved to India during the partition in 1947, identified as *Bangals* in public conversation in West Bengal, are fond of and nostalgic about Bangladeshi *hilsha*. Therefore, ensuring the supply of enough Bangladeshi *hilsha* during festivals is critical for the West Bengal state government. That is why *hilsha* is a crucial part of bilateral discussions between India and Bangladesh. Exporting Bangladeshi *hilsha* fish to India does not depend on its price or economic benefit but on the political relations between India and Bangladesh (Bhowmik 2021; Sen 2022). On several occasions, the Bangladesh government sent *hilsha* consignments to India's state and central governments to celebrate their relationships. However, it also banned *hilsha* export to India, showing their dissatisfaction with Indian policy toward Bangladesh. *Hilsha* thus becomes a symbol of Bangladesh-India diplomatic relations. Therefore, a single criterion of money valuing *hilsha* fish is problematic and indicates the importance of expanding the idea of value to incorporate a commodity's non-economic values.

Conclusion

The positionality and fluidity of value indicate that the same object can have different values depending on the exchange system and valuers' identity. The global economy comprises diverse socio-economic relations and activities that produce critical value, both economic and non-economic; a large part of these relations and activities are invisible in value discussions (Gibson-Graham 1996 & 2006). In her seminal ethnography, *The Mushroom at the End of the World: On the Possibility of life in Capitalist Ruins*, Anna Tsing (2015) brilliantly shows the presence of diverse socio-economic relations and exchange systems in the global supply chain of Matsutake mushrooms and changes of its value. The same Matsutake mushrooms take different forms, sometimes commodity and sometimes gift, thus gaining different value in its global chain. In the former system, the value lies in its use and exchange, whereas in the latter, the value lies in social connection. The existence of diverse economy, exchange and socio-economic relations further complicate the dominant value concept and valuation system, and argue for broadening it to recognize and count all forms of 'alternative' economy, practices and relations that produce value, both qualitative and quantitative.

Critical literature on global value chains (Collins 2013; Dedeoglu 2013; Ferolin 2013) indicates another limitation of the existing valuation system; it highlights the household's significant role in the reproduction of labour typically ignored by economic value theory, both classical and neoclassical. According to Marx, not all labour produces value, but only socially necessary labour –, where 'social' means 'for exchange' – creates exchange value. Therefore, labour expended at a private level, i.e., households, is overlooked and remains uncounted. By contrast, neoclassical value theory overlooks household labour because it does not have an exchange value. Small-scale fisheries present a clear example of these types of uncounted labour. Pre-fisheries activities such as net making, preparing food for fishers, and processing fish, among others, are performed at the household and usually done by the female members of the household; these activities are critical to fisheries but rarely recognized and counted while valuing fisheries (Rahman

2018). A considerable amount of literature (Clelland 2013; Dunaway 2013) shows the essential roles of unrecognized and unpaid household labour in producing critical values, such as economic and social values, in the global value chains. Therefore, the valuation of a thing will be partial unless we count all types of labour expended producing it and every kind of value produced by them.

The standard of value has made the valuation and exchange of two different entities possible. Standards of value vary by society and time. Even a single society can have multiple value standards simultaneously (Gregory 1997). The diverse economies literature (Lee 2013; Roelvink 2009; Roelvink et al. 2015; Gibson-Graham & Dombroski 2020) challenges the uniformity of capitalism and argues that the market economy is not uniform but diverse. The capitalist system is linked with the non-capitalist and sometimes depends on the latter for survival. Labour, transactions, value are not uniform but diverse.

In a market economy, money is the dominant standard of value, used in the valuation and exchange of two different entities. This single standard, money-centric valuation system is problematic for three reasons. First, it fails to recognize the real value of a thing; it cannot recognize and count the nonwage, unpaid or differently paid labour costs in its production (Clelland 2013; Dedeoglu 2013; Ferolin 2013). Over fifty percent of economic activity globally does not follow the principles of the market economy (Gibson-Graham 2006); therefore, it remains uncounted. The money-centric valuation system of the market economy falls short of recognizing these diverse 'non-economic' activities and their values. It will be partial and misleading to value a thing until we count all forms of labour spent producing it. Second, it has an impoverished understanding of a commodity's non-economic, qualitative values; thus, it fails to recognize and count its total value. It is particularly evident while valuing natural resources. The capitalist valuation system underpins the marginal utility theory, overlooks the diverse qualitative values of natural resources, and fails to recognize its total values (Collins 2016). A novel example of it is small-scale fisheries. The majority of the existing literature only counts the economic value of fish when evaluating the small-

scale fisheries of a specific locality. Small-scale fisheries' contributions to nutrition security, livelihood, ecology, local culture are rarely recognized and counted. Finally, the political ecology and feminist literature (Riisgaard et al. 2010; IFC 2013) argue that the capitalist valuation system underestimates the various disvalues produced through commodity production while assigning commodity value. The value of the natural resources used in commodity production and the pollution created by production are not considered in the mainstream valuation system, thus failing to provide true value (Collins 2013).

The above discussion identified that value is multidimensional. All types of values are significant and are not reducible to a single monetary metric. Thus, the monetary valuation system of marginal utility theory that recognizes and measures only the economic value fails to consider a thing's non-economic values. This limitation of mainstream valuation systems and the diversity of value, exchange, and valuation systems highlight the importance of broadening the concept of the value and valuation. We require a value theory that is sensitive to diversity and offers a way of making visible non-economic values that the existing valuation system typically overlooks.

References

Acott, Tim G., Derek S. Johnson, Natasha Stacey, and Julie Urquhart. 2018. "Reflections on Social Wellbeing and the Values of Small-Scale Fisheries: Implications for Research, Policy and Management." In *Social Wellbeing and the Values of Small-Scale Fisheries*, edited by Derek S. Johnson, Tim G. Acott, Natasha Stacey, and Julie Urquhart, 317–32. MARE Publication Series 17. Springer.

Bhowmick, Soumya. 2021. "How Ilish Found Itself In The Midst of Indo-Bangladesh Diplomacy." News Portal. ZEEZEST.COM. June 22, 2021. <https://zeezest.com/food/what-makes-hilsa-so-important-in-bengali-cuisine-and-culture-zee-zest-418>.

Biswal, Rajib, Derek Johnson, and Fikret Berkes. 2017. "Social Wellbeing and Commons Management Failure in a Small-Scale Bag Net Fishery in Gujarat, India." *International Journal of the Commons* II (2): 684–707. <https://doi.org/10.18352/ijc.742>.

Clelland, Donald A. 2013. "Unpaid Labor as Dark Value in Global Commodity Chains." In *Gendered Commodity Chains: Seeing Women's Work and Households in Global Production*, edited by Wilma A. Dunaway, 72–90. Stanford, California: Stanford University Press.

Collins, Jane. 2013. "A Feminist Approach to Overcoming the Closed Boxes of the Commodity Chain." In *Gendered Commodity Chains: Seeing Women's Work and Households in Global Production*, edited by Wilma A. Dunaway, 27–37. Stanford, California: Stanford University Press.

Collins, Jane L. 2016. "Expanding the Labor Theory of Value." *Dialectical Anthropology*. <https://doi.org/10.1007/s10624-016-9418-5>.

Deb, Apurba Krishna, and Emdad Haque. 2011. "Every Mother Is a Mini-Doctor': Ethnomedicinal Uses of Fish, Shellfish and Some Other Aquatic Animals of Bangladesh." *Journal of Ethnopharmacology* 134 (2): 259–67. <https://doi.org/10.1016/j.jep.2010.12.001>.

Dedeoglu, Saniye. 2013. "Patriarchy Reconsolidated: Women's Work in Three Global Commodity Chains of Turkey's Garment Industry." In *Gendered Commodity Chains: Seeing Women's Work and Households in Global Production*, edited by Wilma A. Dunaway, 105–18. Stanford, California: Stanford University Press.

Dunaway, Wilma A. 2013. "Through the Portal of the Household: Conceptualizing Women's Subsidies to Commodity Chains." In *Gendered Commodity Chains: Seeing Women's Work and Households in Global Production*, edited by Wilma A. Dunaway, 55–71. Stanford, California: Stanford University Press.

Ferolin, Maria Cecilia. 2013. "Commodity-Chained Fishing Households: Peasant Subsidization of Exports in a Philippine Seafood-Extractive Enclave." In *Gendered Commodity Chains: Seeing Women's Work and Households in Global Production*, edited by Wilma A. Dunaway, 156–74. Stanford, California: Stanford University Press.

Foley, Duncan K. 1999. *Notes on the Theoretical Foundations of Political Economy*. Oxford: Blackwell.

Gibson-Graham, Julie Katherine. 1996. *The End of Capitalism (as We Knew It): A Feminist Critique of Political Economy*. Oxford: Blackwell.

Gibson-Graham, Julie Katherine, and Kelly Dombroski. 2020. "Introduction to The Handbook of Diverse Economies: Inventory as Ethical Intervention." In *The Handbook of Diverse Economies*, edited by Julie Katherine Gibson-Graham and Kelly Dombroski, 1–24. Cheltenham, UK: Edward Elgar Publishing.

Ginkel, Rob van. 2009. *Braving Troubled Waters: Sea Change in a Dutch Fishing Community*. MARE Publication Series 4. Amsterdam: Amsterdam University Press.

Graeber, David. 2001. *Toward an Anthropological Theory of Value: The False Coin of Our Own Dreams*. New York, NY: Palgrave Macmillan.

Graeber, David. 2013. "It Is Value That Brings Universes into Being." *HAU: Journal of Ethnographic Theory* 3 (2): 219–43.

Gregory, C.A. 1982. *Gifts and Commodities*. First. Chicago: HAU Books.

Gregory, C.A. 1997. *Savage Money: The Anthropology and Political Commodity Exchange*. Amsterdam: harwood academic publishers.

Griffith, David, and Manuel Valdes Pizzini. 2002. *Fishers at Work, Workers at Sea: Puerto Rican Journey Through Labor and Refuge*. Philadelphia: Temple University Press.

Hancock, Ange-Marie. 2007. "Intersectionality as a Normative and Empirical Paradigm." *Politics & Gender* 3 (2): 248–54. <https://doi.org/10.1017/S1743923X07000062>.

Hartmann, Heidi. 2013. "The Unhappy Marriage of Marxism and Feminism: Towards a More Progressive Union." In *Feminist Theory Reader: Local and Global Perspectives*, edited by Carole McCann and Seung-Kyung Kim, 187–99. New York, NY: Routledge.

Hoyo, Juan José García del, and Celeste Jiménez de Madariaga. 2016. "The Debate on the Concept of Value: Interpretations from the Perspective of Economics and Social Anthropology." *Mediterranean Journal of Social Sciences* 7 (2): 11–20. <https://doi.org/10.5901/mjss.2016.v7n2p11>.

International Finance Corporation (IFC). 2013a. *Assessing and Managing Environmental and Social Risks in an Agro-Commodity Supply Chain*. International Finance Corporation (IFC).

International Finance Corporation. 2013b. *Good Practice Handbook: Assessing and Managing Environmental and Social Risks in an Agro-Commodity Supply Chain*. International Finance Corporation (IFC). https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_agrosupplychains.

Islam, Mohammad Mahmudul, and Ratana Chuenpagdee. 2018. "Nomadic Fishers in the Hilsa Sanctuary of Bangladesh: The Importance of Social and Cultural Values for Wellbeing and Sustainability." In *Social Wellbeing and the Values of Small-Scale Fisheries*, edited by Derek S.

Johnson, Tim G. Acott, Natasha Stacey, and Julie Urquhart, 195–216. Amsterdam: Springer.

Jadhav, Adam. 2018. “Undefining Small-Scale Fisheries in India: Challenging Simplifications and Highlighting Diversity and Value.” In *Social Wellbeing and the Values of Small-Scale Fisheries*, edited by Derek S. Johnson, Tim G. Acott, Natasha Stacey, and Julie Urquhart, 147–73. Amsterdam: Springer.

Johnson, Derek S., Rajib Biswal, and Jyothis Sathyapalan. 2018. “History and Social Difference in Arguments for the Societal Values of Small-Scale Fisheries in Gujarat.” In *Social Wellbeing and the Values of Small-Scale Fisheries*, edited by Derek S. Johnson, Tim G. Acott, Natasha Stacey, and Julie Urquhart, 267–92. MARE Publication Series 17. Springer.

Kabir, Ashraful, and Trevor J. Hawkeswood. 2020. “Remedial / Medicinal Value of Cuchia Fish: A Mini Review.” *Calodema* 834: 1–5.

Kim, Soyeon, Izumi Mori, and Abd Rahman Abdul Rahim. 2018. “Cultural Values Matter: Attractiveness of Japanese Companies in Malaysia.” *International Journal of Cross Cultural Management* 18 (1): 87–103. <https://doi.org/10.1177/1470595818759570>.

Kurz, Heinz D., and Neri Salvadori. 2002. “‘Classical’ vs. ‘Neoclassical’ Theories of Value and Distribution and the Long-Period Method.” In *General Equilibrium Problems and Prospects*, edited by Frank Hahn and Fabio Petri, 216–45. London: Routledge. <https://www.researchgate.net/publication/242461409>.

Lee, Roger. 2013. “The Possibilities of Economic Difference? Social Relations of Value, Space and Economic Geographies.” In *Alternative Economics and Spaces: New Perspectives for a Sustainable Economy*, edited by Hans-Martin Zademach and Sebastian Hillebrand, 3:69–84. Bielefeld: Transcript Verlag.

25. EXAMINING VALUE FROM A SOCIO-CULTURAL PERSPECTIVE

Lévi-Strauss, Claude. 1969. *The Elementary Structures of Kinship*. London: Eyre & Spottiswoode.

Malinowski, Bronislaw. 1961. *Argonauts of the Western Pacific*. New York: E. P. Dutton.

Marshall, Alfred. 1920. *Principles of Economics*. 8th ed. London: Macmillan.

Marx, Karl. 1976. *Das Kapital*. Vol. 1. Penguin.

Marx, Karl. 2000. "Value, Price, and Profit (Abridged): An Introduction to the Theory of Capitalism." Edited by Eleanor Marx. *Research in Political Economy* 18: 3–39.

Mauss, Marcel. 1974. *The Gift: Forms and Functions of Exchange in Archaic Societies*. Translated by Ian Cunnison. London: Routledge & Kegan Paul.

Otto, Ton, and Rane Willerslev. 2013a. "Introduction: 'Value as Theory': Comparison, Cultural Critique, and Guerilla Ethnographic Theory." *HAU: Journal of Ethnographic Theory* 3 (1): 1–20. <https://doi.org/10.14318/hau3.1.002>.

Otto, Ton, and Rane Willerslev. 2013b. "Prologue: Value as Theory: Value, Action, and Critique." *HAU: Journal of Ethnographic Theory* 3 (2): 1–10. <https://doi.org/10.14318/hau3.2.002>.

Polanyi, Karl. 1944. *The Great Transformation: The Political and Economic Origins of Our Time*. Boston: Beacon Press.

Prabhakar, Amit Kumar, and S. P. Roy. 2009. "Ethno-Medicinal Uses of Some Shell Fishes by People of Kosi River Basin of North-Bihar, India." *Ethno-Medicine* 3 (1): 1–4.

Rahman, Md Mahfuzar. 2018. "Fisher Engagements with Transition in a Small-Scale Inland Fishery: Long-Term Structural Change, Fisher Agency, and Wellbeing in Parbatipur Sub-District, Bangladesh." Winnipeg, Manitoba: University of Manitoba.

Rajani, Naranje, and Mishra Alka. 2015. "To Study the Ethano-Medicinal Importance of Food Fish Used by Localite of Durg." *Journal of Environmental Science, Toxicology and Food Technology* 1 (6): 38–40.

Ricardo, David. 2001. *On the Principles of Political Economy and Taxation*. Third. Ontario, Canada: Batoche Books.

Riisgaard, Lone, Simon Bolwig, Stefano Ponte, Andries du Toit, Niels Halberg, and Frank Matose. 2010. "Integrating Poverty and Environmental Concerns into Value-Chain Analysis: A Strategic Framework and Practical Guide." *Development Policy Review* 28 (2): 195–216.

Roelvink, Gerda, Kevin St. Martin, and J. K. Gibson-Graham, eds. 2015. *Making Other Worlds Possible: Performing Diverse Economies*. Minneapolis: University of Minnesota Press.

Roos, Nanna, Mohammad M Islam Islam, and Shakuntala H. Thilsted. 2003. "Small Indigenous Fish Species in Bangladesh: Contribution to Vitamin A, Calcium and Iron Intakes." *Nutrition* 133: 4021S-4026S. <https://doi.org/10.1093/jn/133.11.4021S>. PMID: 14672305.

Sen, Prarthana. 2022. "Bangladesh's Hilsa Fish Diplomacy: Every Year, India's Durga Puja Festivities See a Surge in Demand for the Fish from Bangladesh." *The Diplomat*. September 29, 2022. <https://thediplomat.com/2022/09/bangladeshs-hilsa-fish-diplomacy/>.

Sharma, Chandrika. 2011. "Securing Economic, Social and Cultural Rights Of Small-Scale and Artisanal Fisherworkers and Fishing Communities."

Maritime Studies (MAST) 10 (2): 41–61.

Smith, Adam. 2003. *The Wealth of Nations*. Edited by Edwin Cannan. New York, NY: Bantam.

Song, Andrew M. 2018. “How to Capture Small-Scale Fisheries’ Many Contributions to Society? Introducing the ‘Value-Contribution Matrix’ and Applying It to the Case of a Swimming Crab Fishery in South Korea.” In *Social Wellbeing and the Values of Small-Scale Fisheries*, edited by Derek S. Johnson, Tim G. Acott, Natasha Stacey, and Julie Urquhart, 125–46. MARE Publication Series 17. Springer.

Taylor, Kit Sims. 2001. *Human Society and the Economy*. Online economics textbooks. SUNY-Oswego, Department of Economics.

Thompson, E. P. 1991. “The Moral Economy of the English Crowd in the Eighteenth Century.” In *Customs in Common*, edited by E. P. Thompson, 185–258. New York: The New Press.

Tsing, Anna Lowenhaupt. 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press.

Vallejo, José Ramón, and José Antonio González. 2014. “Fish-Based Remedies in Spanish Ethnomedicine: A Review from a Historical Perspective.” *Journal of Ethnobiology and Ethnomedicine* 10 (37): 1–31.

Widlok, Thomas. 2013. “Sharing: Allowing Others to Take What Is Valued.” *HAU: Journal of Ethnographic Theory* 3 (2): 11–31.

26. Navigating Weights and Measurements in the Dried Fish Supply Chain

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Introduction

Unit-based pricing (e.g., price per piece) and weight-based pricing (e.g., price per kg), are two of the most common pricing strategies for unpackaged groceries in modern retailing business. The dried fish markets of Karnataka (Uttara Kannada district in particular), which are mostly run by women, showcase how women operators navigate traditional weights and measurements on one hand, and prices on the other, both of which vary by fish across the supply chain nodes. While mapping the dried fish markets in Karnataka, the authors noticed that sellers of dried fish use different weights and measurements for selling different fish species. We probed further in the supply chain to understand what measurements are followed in the

procurement process of different species. This led us to multiple and varied measurements in various nodes of the supply chain of different species. We found some species being sold in counts/numbers (unit-based pricing), some in kg (weight-based pricing), some by non-standardized heaps, and yet others by volume measured in 'Kolaga' and 'Seru' – two pails of different sizes for measurement. To add to the complexities, the weight of the fish (in terms of mass and volume) goes through a change as the wet fish loses weight in the drying process and the level of moisture content changes. The amount of salting would also change the weights. This led us to ask, how do the women involved in small-scale dried fish processing and trading navigate varied weights and measurements used during procurement, processing and selling the products to the consumers? How do experience and intuitive cognitive abilities help these women who are barely literate, to navigate the process? Is there a trade secret from which they tend to gain, or do they lose out or discount their own (non-market and mostly labour) contribution in the process? Why don't they follow a uniform method of measurement across the species and in the supply chain? Are there patterns associated with such weights and measurement practices? For example, do different patterns of measurements explain anything about the local food system? Do homogenization and standardization of units and measurements then become a part of long-distance trading and transactions?

Through four short case studies we explain the process of measurement in different nodes of the dried fish supply chain. While we group some species across different types of measurement in the supply chain, we also follow a few species, in an attempt to understand and document such varied measurement practices. To address a larger question, homogenization and standardization of measurement are some of the prime attributes of a capitalist economy and its expansion. In that context, we can raise questions about how multiple economic systems of transactions co-exist and what such transactions tell us about the economic system, which is perhaps embedded in localized, social, cultural, and path-dependent practices.

Weights and measurements are fundamental elements for transactions in product markets, and these have evolved over time. Traditional weights and

measurements are often highly localized. They are found in transactions of various commodities including food and many other essential items. Such practices also change over time, driven by numerous factors. The Uttara Kannada district of Karnataka was once known for its traditional fishing, but as time passed, mechanization and motorization of fishing vessels increased, though the district still has substantially larger share of non-motorized boats compared to the other two coastal districts of Karnataka.³¹ However, traditional weights and measurements are being used even today at various stages in the fisheries sector of the district, particularly in the dried fish business.

In 1790, scientists from all across the world began to embrace and use the International System of Units. More than two centuries have passed since then, yet old weights and measurements may still be found in some areas, which is both culturally and economically fascinating. This type of traditional weights and measurements can be seen more prominently in Uttara Kannada's dried fish markets. For example, dried mackerel is typically sold by the count; croakers and *Lactarius* (False Trevally) by the baskets; and shrimps and tiny fish like anchovies by the bowls. To understand the use of different weights and measurements along the supply chain of these individual dried fish products, we observed the transactions made by dried fish processors and retailers through a case study approach. Figure 1 shows the fish species chosen for the case studies. These fish are: Indian mackerel (*Rastrelliger kanagurta*); False Trevally (*Lactarius lactarius*); anchovy (*Stolephorus commersonii*); and Indian white shrimp (*Fenneropenaeus indicus*).³²

³¹ Uttara Kannada is also less industrialized, compared to the other two coastal districts of Karnataka. The people of the district have resisted industrialization through several legal and civic struggles in the past. However, the district is most likely to be industrialized over the next decade or so particularly with the new Blue Economy policy of the Government of India.

³² Different species of anchovies and shrimp are landed in Karnataka, and those shown in Figure 1 are only representative.

26. NAVIGATING WEIGHTS AND MEASUREMENTS IN THE DRIED FISH...

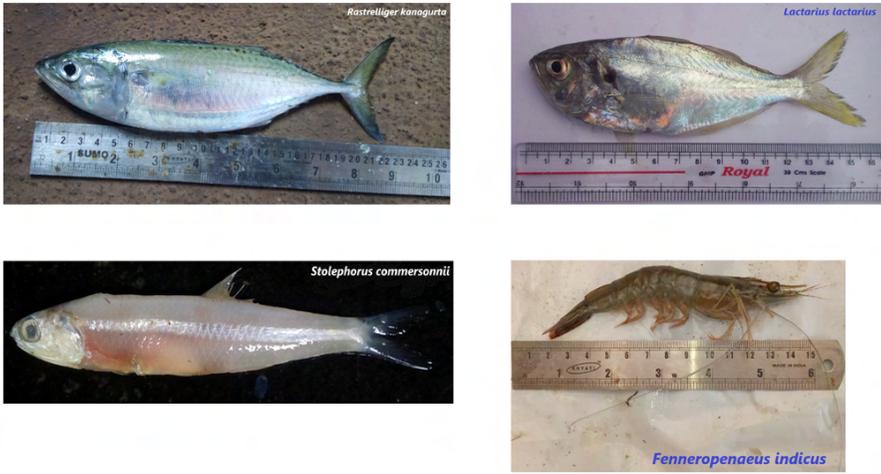


Figure 1. The four fish varieties analyzed in the dried fish weights and measurements case studies. Image credit for *Rastrelliger kanagurta*, *Lactarius lactarius*, and *Stolephorus commersonii*: Authors. Image credit for *Fenneropenaeus indicus*: [India Biodiversity Portal \(2021\)](#)

Case studies

Weights and measurements in the dried Indian mackerel supply chain

Indian mackerel (*Bangudey/Bangda* in Kannada and Tulu) has long been regarded as one of the most valuable species of dried fish. Karnataka is considered the mackerel coast due to the large catches of mackerel during peak fishing seasons. It is the fisherwomen who are in charge of the fish-curing and drying operations, and fish processing and marketing in general. Fisherwomen in Karwar's Tagore Beach, Baithkol, and Majali areas have been producing dry-cured fish for generations. Retail customers come here even from the neighbouring Goa state to purchase dried fish, particularly mackerel. Uttara Kannada fishing and fish marketing practices are particularly integrated in the family in the sense that the husband goes

out to fish and gives the harvest to his wife. The wife decides what amount to retain for home consumption, what to sell in retail markets as fresh fish, and what is to be dried, and then processes that fish further (primarily by salting and drying) for sale in the retail market. Thus, women take care of the post-harvest financial and physical transactions of the fish business. Fisherwomen typically use the unsold wet mackerel (one or two-day old fresh/raw fish unsold in the market) for drying and curing. The fish are rinsed with water and dried in the sun. This process results in high-quality dried mackerel. However, processing a small quantity of unsold fish into dried fish is not economically viable. As a result, dried fish processors rely on various additional sources for raw fish. These sources include agents who collect unsold mackerel from various wet markets and landing locations, straight from the boats, through auctions, and so on.

One of the women processors interviewed, Sharada (pseudonym), discussed the method she uses in processing and the weights and measurements she uses in trade. She is a fisherwoman who produces dried mackerel near Tagore Beach. She has no family members who practice fishing. As a result, she is dependent on agents who bring the mackerel from various places, and she purchases it in kilograms. She sells dried mackerel by the fish (count system) at the Sunday wholesale market. The supply chain and the weights and measures used are shown in Figure 2.

26. NAVIGATING WEIGHTS AND MEASUREMENTS IN THE DRIED FISH...

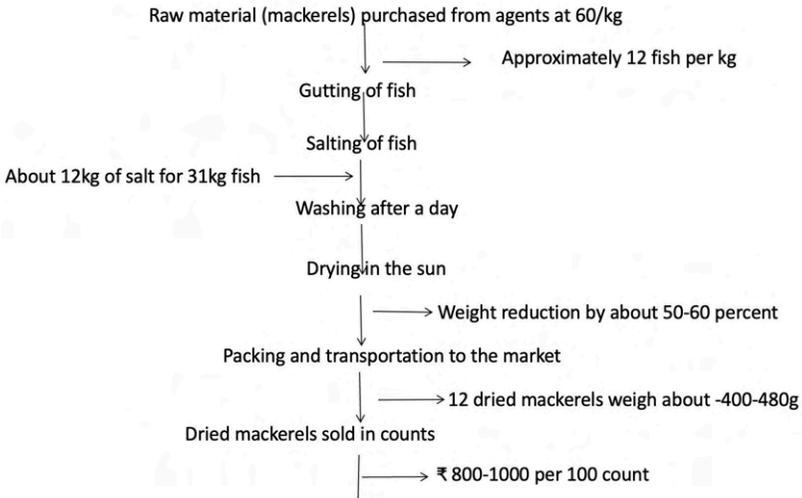


Figure 2. Weights, measurements, and prices in the dried Indian mackerel supply chain

Table 1 shows the weights and measurements used in typical mackerel dried fish supply chain in Uttara Kannada, based on data collected from Sharada. Sharada paid 60 rupees (₹) per kg of mackerel (one Indian Rupee is about 0.0165 Canadian Dollar as of 31 March 2022). These were medium-sized fish, and a kg of mackerel contained 12 fish. Each box of fish weighed around 31 kg. She removed the gut and gills, a process called degutting/gutting. The fish belly was then stuffed with salt and stored in a box for 1 to 2 days. Following that, the salted fish was rinsed in water to remove excess salt content. The washed fish was spread out on a coconut coir mat, encircled by an abandoned fishing net. It took two sunny days for the fish to dry to the appropriate level, losing 50-60 percent of their moisture in the process. The same 12 dried mackerel that weighed one kg would now weigh 400-480 grams. The dried mackerel was then packed in bamboo baskets and carried on the head to the nearest weekly market, known as the Sunday Bazar. It was sold there at ₹800-1,000 for every 100 dried mackerel. Sharada processes and sells 4 to 6 baskets/boxes of mackerel every week depending on raw fish availability. Figure 3 provides photographic illustration of the different stages in dried

mackerel processing and the weights and measurements used therein.

Table 1. Weights, measurements, and prices along the dried mackerel supply chain at Karwar

Dried fish supply chain stage	Weights and measurements used	Amount
Raw material (wet fish) procurement	31 kg mackerel per basket;	₹60/kg fish,
	About 12 fish per kg of mackerel	12 fish×31
Salting	12 kg for 31 kg fish	12×₹5 = ₹60
Transportation cost	Nil (headload)	
Weight reduction by 50-60%	12.5 to 15 kg dried fish yield	₹2976-₹3720
Selling price at Karwar wholesale market	Sold in counts of 50, 100, 200, 1000	₹8-₹10 per fish

Sharada procured three boxes of mackerel in the first week of October 2021, through agents at wet fish markets in Karwar, Hubballi, and Goa. Fresh fish are usually sourced from the Baithkol landing centre but they went unsold in the destination/retail market. The agents who supply wet fish to retail markets take back the unsold fish. They purchase this fish either in kg or in lots depending on the quality of the fish. People in Karwar and Goa put emphasis on the freshness of the fish. Therefore, fish are graded on quality (freshness). Demand for lower quality fish is quite low. Fish stored in cold storage for an extended period of time are considered to be of poor quality and are used in dried fish processing.

Sharada's story is a general depiction of numerous little variations across the Karnataka coast in relation to mackerel weights and measurements in different supply chain nodes. At Bengre in Mangaluru, the raw material for dried fish production is obtained in kg, either straight from the boat or from an agent. The agents are able to obtain mackerel suitable for dried fish processing from multiple vessels in tiny quantities at various prices. Then it is sold to producers in two types of baskets of 20 and 40 kg capacity at a price determined by the weight of the product. The dried fish is sold at the Mangaluru wholesale market, in similar 20 and 40 kg baskets. The cost is determined based on the weight of fish contained in the baskets. In Gangolli, Kundapura, the raw material for dried mackerel is obtained from

26. NAVIGATING WEIGHTS AND MEASUREMENTS IN THE DRIED FISH...

boat agents. The agents buy a large quantity of fish from the boat. The agent's experience allows them to estimate the weight of the fish. Then they give it to the processors, using kg as the unit of measure. The raw material is purchased in baskets (30-40 kg) at a price dependent on the estimated weight of the fish. After the mackerel has dried, it is sold by the kg to the buyers who often are retailers or wholesalers from all across the hinterland and coastal lands.



Figure 3. A photographic representation of mackerel supply chain and the use of weights and measurements. Image 1) An agent supplying raw fish at the drying yard. Image 2) Degutting and rubbing the mackerel with salt. Image 3) Salting the mackerel in a plastic crate. Image 4) Using seawater to wash-off the excess salt. Image 5) Drying the mackerel on a coir mat. Image 6) Placing the dried mackerel in a basket for transportation. Image 7) Transporting dried mackerel to the retail market. Image 8) The seller (women processor) and the buyer negotiating at a retail market. Image 9) Women processors/sellers selling dried mackerel to hinterland retail customers. Source: Authors

DRIED FISH MATTERS

Processors like Sharada purchase fresh mackerel in kg and then sell the product by the count, often to restaurants and final consumers but even to traders from distant areas, defying the modern standardized unit system. This count system is also being used by other retailers (see Figure 4). It is particularly common in the Uttara Kannada district's dried fish sector. Most of these processors engaged in dried fish processing are small in scale. They dedicate substantial time and labour to earn a livelihood. This weights and measurements system has helped local processors make a reasonable return on dried mackerel. This is further demonstrated in Tables 5 and 6.



Figure 4. Dried mackerel sold by count in a fish market in coastal Karnataka.

Credit: Authors

Weights and measurements in the dried *Lactarius* (False Trevally) supply chain

Lactarius (*Adey meenu* in Kannada/Tulu) is considered one of the delicacies among the dried fish varieties available. It is produced by nearly every dried fish processor along the coast and is in great demand among dried fish retailers in the hinterland. We observed the *Lactarius* dried fish operations at Tadadi in Uttar Kannada district. During the months of September to March, the fishing boats at the landing centre bring huge harvests of this fish and processors buy it directly from the boats or through auctions. Apart from Tadadi landing centre, the raw fish comes from Mangaluru and Malpe, and local agents bring it to the processors here.

Shakuntala (name changed), a woman dried-fish processor, spoke about the method she employs to navigate various weights and measurements in the supply chain. She usually buys raw fish straight from the boat but at times through a local agent. Shakuntala uses 4-5 kg of salt per basket of fish weighing approximately 20 kg. She keeps the fish for one day in a plastic container and then rinses it in water from the Aghanashini estuary to remove any excess salt. The fish is kept in a tiny basket to allow excess water to drain. She then scatters it on a concrete platform that she leased for a year. The fish need 1 or 2 days to dry. In the process, it loses 60-65 percent of its weight. Fish processed in this way is regarded by buyers as being of 'ideal quality'. Shakuntala arranges the dried fish in a basket to contain about 45 kilograms of *Lactarius*. She carries the fish, using locally available transportation (most often private vehicles) to the wholesale markets in Ankola or Karwar, where she sells the entire basket or portions of it. Figure 5 shows the weights and measurements used at different stages of supply chain of dried *Lactarius* and the prices.

DRIED FISH MATTERS

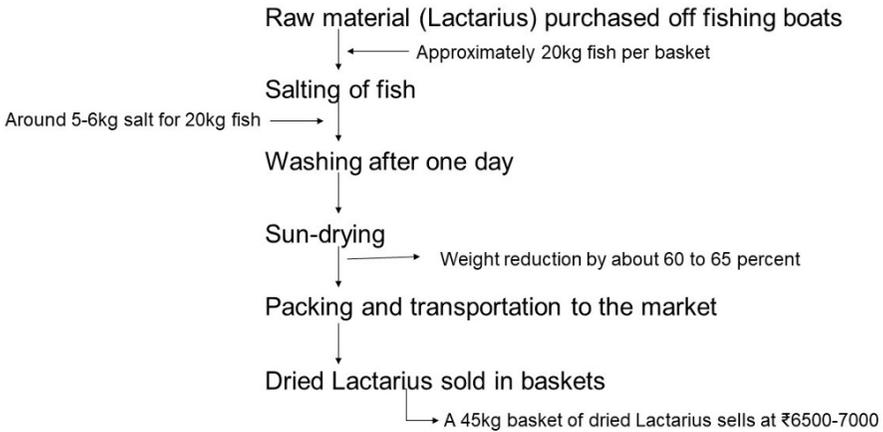


Figure 5. Weights, measurements, and prices in the dried Lactarius supply chain at Tadadi

Table 2 shows the weights and measurements at different stages of *Lactarius* production, and the corresponding prices received. Shakuntala wants to sell the entire basket for ₹6,500 to ₹7,000, which would give her a return of roughly ₹150/kg of dried *Lactarius*. The retailers, particularly head-loaders and hinterland sellers, sell dried *Lactarius* in smaller heaps or piled in smaller baskets. Each basket or stack of fish weighs roughly 390 grams and is sold for 100 rupees. This gives them a return of ₹257/kg. The selling weight varies from one retailer to another. The size of the heap is determined by a variety of factors such as purchase price, shipping cost, weight loss, land use fees paid by the retailer, the size and perceived quality of the fish, and so on. Typically, in the Karwar retail shops, they quote a base price of ₹150 and then sell it for ₹100 after bargaining and negotiation. Retailers in hinterland areas such as Shirasi sell 250 g of *Lactarius* for ₹100. This results in a return of ₹400/kg of dried fish. Figure 6 provides a photographic coverage of different stages in dried mackerel processing and the weights and measurements used therein.

Table 2. Weights, measurements, and prices along the dried *Lactarius* supply chain at Tadadi

Dried fish supply chain stage	Weights and measurements used	Amount
Purchasing the raw material (fish)	20 kg basket of <i>Lactarius</i> ×6 baskets	₹600 × 6 = ₹3,600
Salt per basket	5 kg for 20 kg fish ×6 baskets	5×20×₹4 = ₹400
Transportation cost	150 per basket	₹150
Weight reduction by 60-65%	7-8 kg yield from 20 kg ×6 baskets	45 kg
Selling price at Karwar wholesale market	A basket of 45 kg of fish	₹6,500-₹7,000



Figure 6. A photographic representation of the *Lactarius* supply chain and the use of weights and measurements. Image 1) Landings of *Lactarius*. Image 2) Salting of *Lactarius* in a concrete tank. Image 3) Washing off excess salt from fish in the Aghanashini river. Image 4) Drying of *Lactarius* on concrete floor. Image 5) Piling dried *Lactarius* in a basket for transportation. Image 6) Unloading of baskets of *Lactarius* from the van at Karwar market early in the morning. Image 7) Retailers buying dried *Lactarius* from wholesalers. Image 8) Retailers carrying dried *Lactarius* to their shops. Image 9) Dried *Lactarius* exhibited in a basket for retail customers. Source: Authors

DRIED FISH MATTERS

The processors buy raw/wet *Lactarius* by the basket and sell dried *Lactarius* by the basket or heap (see Figure 7), but at times by weight (kg). We explain this as follows. Uttara Kannada processors, in contrast to Dakshina Kannada and Udupi processors, are small-scale processors who do their own processing and marketing. If they sell the fish in kg in the wholesale market buyers are likely to converge on the lowest price offered by the vendors or negotiate for the lowest price offered in the market. A heap of 390 g sells for ₹100 at the retail market. However, the processor would make only ₹250-260 per kg of fish if she sold it by weight. Selling by heap obfuscates price differentials among vendors making it harder for the consumers to compare prices across vendors and gives better returns than selling by weight. For different processors, the cost of processing and labour varies. This could be one of the main reasons why processors continue to sell dried fish by the heap and by the basket. This method helps them achieve a reasonable return on their cost of production to earn a decent livelihood.



Figure 7. Dried Lactarius retailed by the heaps in a fish market in coastal Karnataka. Credit: Authors

Of course, there are slight variations across regions in the operation of the dried *Lactarius* markets. In Mangaluru, raw material is purchased in kg, either directly from the boat or through an agent. The dried *Lactarius* that has been processed is also sold in kg at the local wholesale shop. In Kundapura, raw material is obtained in a basket (30 kg weight) and processed dried fish is sold in kg to the customers mostly coming from the hinterland of Karnataka. This seems to suggest that standardized systems are adopted for the longer chains while the heap is preferred for sale to local consumers.

Weights and measurements in the dried anchovy supply chain

Anchovy is a highly sought-after, nutrient-dense small pelagic fish consumed along the Karnataka coast and elsewhere. There are various species of anchovies caught along the Karnataka coast. Anchovies, including *Stolephorus commersonii*, are commonly called *Kollatharu* in Kannada/Tulu, while the Golden anchovy or the Gold-spotted grenadier anchovy (*Coilia dussumieri*) is called *Mandeli*. A significant proportion of anchovies are used for dried fish processing. Dried anchovies are used for consumption by coastal fishing families, especially during the rainy season when fresh fish availability is relatively low. As a result, almost every processor makes dried anchovies. During the fishing season, when anchovies are available in abundance, medium and large-scale processors especially favour producing dried anchovies. Depending on the salt-to-fish ratio, it may be made into several types of dried fish. As a result, the price is determined by the amount of salt in the product. Low-salt-content fish is expensive compared to high-salt-content fish along the Karnataka coast.

Honnagara fishing harbour is one of the largest fish landing facilities in Uttara Kannada. Anchovies are landed from September to May, with the peak fishing season being January to March. Raw fish are purchased by processors either directly from the boat or through agents. Raw material is also supplied by the agents from Kundapura and Bhatkala landing centres.

We spoke to Roshan Begam (pseudonym) in Honnagara, a veteran in the dried fish business with 35 years of experience, about dried anchovy

DRIED FISH MATTERS

procurement, processing and the weights and measurements used in the supply chain. Figure 8 shows the weights and measurements used at different stages of the supply chain of dried anchovies and the prices. Roshan Begam obtains raw material directly from the boat. She buys it in baskets that weigh between 30 and 35 kg and costs roughly ₹1,500. She adds salt to the fish in a concrete tank in a 10:1 (fish to salt) ratio, marinates the anchovies in it, and then washes them in Sharavati estuarine water an hour or two later. She then spreads the fish on a concrete platform for sun drying. It takes 1-2 days for the fish to lose 65-70 percent of its weight. The fish reduces to 30 percent of its original weight, which is regarded as optimal for dried anchovies, decreasing from 30-35 kg to 10-12 kg. Rosham then sells dried anchovies at the wholesale market by the *Kolaga* (a wooden bowl that can hold about 500g of anchovies) for ₹100 to ₹130. Apart from *Kolaga*, retailers also use *Seru*, a smaller measuring bowl/pail that can hold roughly 300 g of anchovies and is sold for ₹100.

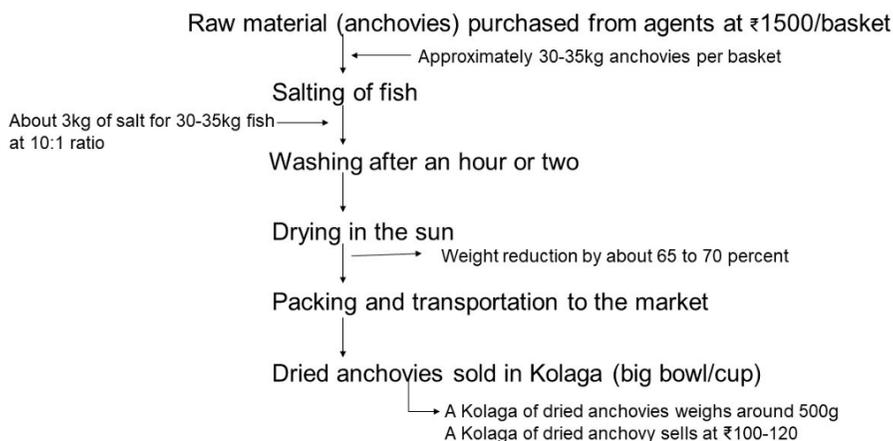


Figure 8. Weights, measurements, and prices in the dried anchovy supply chain at Honnavara

Figure 9 provides photographic overview of the different stages in dried

26. NAVIGATING WEIGHTS AND MEASUREMENTS IN THE DRIED FISH...

anchovy processing and the weights and measurements used therein. One Kolaga of dried anchovies contains about 480g of fish and is sold at ₹125 per Kolaga. One kg of dried anchovies costs about ₹180-220. Thus, again, selling by traditional measurements gives better returns to the seller than modern weight-based pricing. Figure 10 is the photo of a Kolaga-full of dried anchovies.

At Malpe fishing harbour in Udupi, fresh anchovies are purchased in heaps through auctions. Fishers make an estimate of the weight of the heap based on the number of boxes unloaded from the boat to the landing center that are required to make one heap. The anchovies in a single heap weigh around 35-40 kg. Processed and dried anchovies are sold by the kg. In Kundapura, anchovies are also bought through auction. A basket of wet anchovies weighs 20 to 35 kg. The wet anchovy is usually weighed by a boat crew member or an agent, who then keeps it for auction. The raw material is processed into dried anchovies and sold by the kg, especially in the hinterland of Karnataka.



DRIED FISH MATTERS

Figure 9. A photographic representation of the anchovy supply chain and the use of weights and measurements at Honnavara. Image 1) Landing of anchovy from a purse-seiner boat. Image 2) Raw fish are transported from the place of sale to the processing yard. Image 3) Seasoning the anchovies with salt. Image 4) Anchovies are spread on the ground for drying after rinsing with water. Image 5) Gunny bags are used to pack and preserve dried anchovies. Image 6) Processors sell dried anchovies to wholesale buyers using a local measuring instrument called Kolaga. Image 7) A small can used for measuring dried fish at a retail shop. Image 8) Anchovies are sold in little lots. Image 9) Kolaga and Seru, the most commonly used measuring cups/pails. Source: Authors



Figure 10. A Kolaga full of dried anchovies sold in a fish market in coastal Karnataka. Credit: Authors

Weights and measurements in the dried estuarine shrimp supply chain

Dried shrimp is another hugely popular delicacy and an important part of the diet, especially in the Uttara Kannada and Konkan regions. As a result, people store it and use it throughout the year in small quantities. The Kannada name for shrimp is *sigadi* and in Tulu it is called *yetti*. The river Aghanashini flows through Kumata to join the Arabian Sea, forming thousands of hectares of estuarine wetland locally known as *Gajani*. Farmers sow a type of saline resistant paddy called *Kagga* in these wetlands at the onset of the southwest monsoon in June. After harvesting the paddy by November, fish/shrimp seeds are allowed to enter the fields during high tide and are reared in the inundated fields until harvest. Fish/shrimp are harvested by filtering them when they try to escape during the low tides. Filtering is carried out continuously from October to June by innovative utilization of bund structures. Larger shrimps are sent to processing factories, while the extremely small shrimps are dried directly on a concrete floor. Dried shrimp is purchased in modest quantities by local (mostly women) vendors and sold at local markets. Women fish traders at Tadadi and Kumta purchase dried shrimp in bigger quantities and sell at the Karwar wholesale market. The harvested and dried estuarine shrimp is sold by the kilogram. The women wholesale vendors who bring dried shrimp to the Karwar market sell it by the Kolaga. The retailers who buy shrimp by the Kolaga sell it in Seru, a smaller unit of measure. One Kolaga is equivalent to about 6 to 7 Seru.

Girija (pseudonym), a Tadadi-based dried fish processor, described the procurement and selling of dried shrimp and the weights and measurements involved in the process. Table 3 and Figure 11 provide the weights and measurements and the prices along the dried shrimp supply chain. Girija paid ₹10,500 for a whole bag (30 kg) of dried shrimp that she procured from Manikatta Gajani, one of the estuarine wetland areas in Kumata Taluka. She hired a vehicle to transport dried shrimp to the Karwar wholesale market on Sunday morning where she sold the dried shrimp for ₹230-240 per Kolaga. One Kolaga of dried shrimp weighs approximately 400g. Retailers who buy

DRIED FISH MATTERS

from her sell the dried shrimp to the final consumers by the Seru. A Seru of dried shrimp weighs approximately 60-65 grams and is sold to consumers for ₹50.

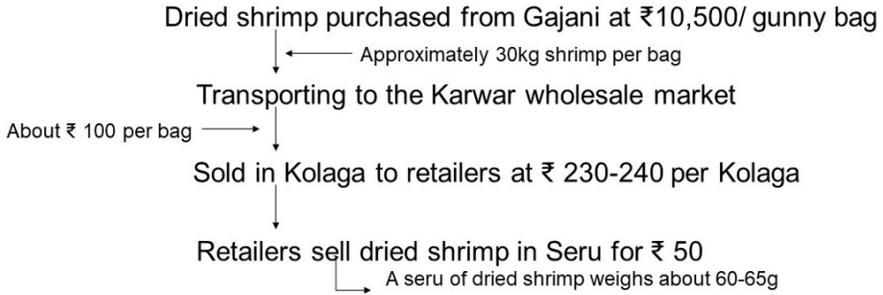


Figure 11. Weights, measurements, and prices in the dried shrimp supply chain at Tadadi

Table 3. Weights, measurements, and prices along the dried shrimp supply chain at Tadadi

Dried shrimp supply chain stage	Weights and measurements used	Amount
Purchasing of dried shrimp	30 kg bag	₹10,500 or ₹350/kg
Transportation cost	₹100	₹100
Selling price at Karwar wholesale market	Sold in Kolaga (a pail of 400g) at ₹230-₹240	₹580-₹600/kg
Selling price at Karwar retail market	Sold in Seru (a pail of 60-65g) at ₹50	₹770-₹830/kg

Figure 12 provides a photographic representation of the dried shrimp supply chain and the use of weights and measurements. The notes below the figure provide descriptions of the individual photographs.

26. NAVIGATING WEIGHTS AND MEASUREMENTS IN THE DRIED FISH...

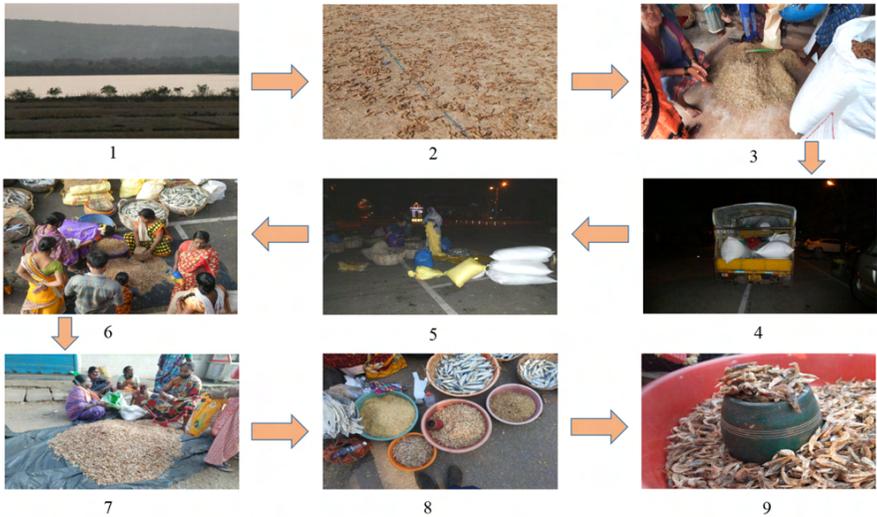


Figure 12. A photographic representation of the dried shrimp supply chain and the use of weights and measurements. Image 1) Gajani, the place where shrimps are reared. Image 2) Harvested smaller shrimps are dried on the concrete floor. Image 3) Dried shrimps are weighed and packed in 40 kg bags. Image 4) Transporting the dried shrimp to the Sunday Bazar. Image 5) Unloading the dried shrimp at the Sunday Bazar. Image 6) Selling the dried shrimp in Kolaga. Image 7) Purchasing of the dried shrimp by retailers from distant markets. Image 8) Retailing the dried shrimp by the Seru at shops in the Sunday Bazar. Image 9) A Seru brimming with fish. Source: Authors

The dried shrimp trade begins in kilograms at the production sites and then switches to the indigenous systems of measurement, i.e., Kolaga and Seru, at the wholesale and retail markets (see Figure 13), respectively. Previously, traditional measurement units were employed even while purchasing dried shrimp at the Gajani (upstream source), a practice that vanished over time, with Kolaga/Seru replaced by the standard unit, i.e. kg. However, the indigenous system persists at the downstream segment of the supply chain. Final consumers often buy dried shrimp in smaller quantities. Hence, it is apparent that the traditional measurements system works well in this segment

DRIED FISH MATTERS

of transaction. One of the reasons is the rapid loss of weight as the moisture in the shrimp declines, making it unviable if standard weight units of kilograms or grams are used. This remains an important factor keeping the indigenous volume-based system in use. As shown in Table 4, selling by the traditional measurements works out better compared to weights-based pricing in terms of profits.

Table 4. Dried estuarine shrimp measurements and pricing

Bowl (Kolaga and Seru)	Price per Kolaga (₹)	Price per kg (₹)
1 Kolaga (390 g) - in the wholesale market	240-260	600 approx.
1 Seru (65 g) - in the retail market	50	750 approx.



Figure 13. Dried shrimp measured in traditional measuring cups and sold at a fish market in coastal Karnataka. Credit: Authors

Findings

The four case studies from Karnataka shed light on various weights and measurements that the dried fish processors navigate along the supply chain. We attempted to understand this supply chain by consciously choosing four different species which are sold to final consumers using different traditional units of measurements: mackerel by the count, *Lactarius* by the basket or heap, and anchovies and small shrimp by the Kolaga and Seru. Moisture loss and scale of operation could be some of the prominent reasons for persistence of these traditional systems. Processors must keep track of changes in quantities brought about by processing as well as the implications of units of measurement. We intended to understand the economic returns to generalize if such traditional systems of measurements are gainful for the processors and traders. Table 5 shows the price realization to be better in traditional units as compared to standard units.

Table 5. Price comparisons between traditional and kilogram based dried fish measurements

Species	In kg	Price ₹/kg	Dried fish yield in %	Unit of measure		Net weight in kg	Selling price in ₹/kg	Selling price in ₹/Measure
Mackerel	33	60	53.9	Count	400	17.8	3560	4000
Anchovies	35	50	34.3	Kolaga	24	12	2640	3120
<i>Lactarius</i>	30	40	60	Basket	1	18	2160	2400
Shrimp	30	350	-	Kolaga	-	-	-	-

Processors must navigate variations in weight while degutting, salting, washing, and drying the fish. The changes in weight during processing are presented in Appendix 1. Based on our interviews with these dried fish processors, we understood they engage in the processing of different varieties of fish species based on demand and availability. A typical processor procures different species in certain quantities. A heuristic yet representative quantity of fish processed by a typical processor is provided in Appendix 2.

DRIED FISH MATTERS

The working capital required for each species varies. We have calculated the approximate working capital required to produce dried mackerel (Appendix 3), anchovy (Appendix 4), and *Lactarius* (Appendix 5). Considering other costs including fixed capital (Appendix 6), Table 6 shows that the processors gain nearly three times more using the traditional method of measurement. Thus, processors and sellers would lose out financially by switching to standard weights and measurements.

Table 6. Returns from dried fish sales, comparison of traditional weights and measurements vs. kilogram

	Particulars	Price (₹)
1	Raw material cost	1,026,900
2	Total working capital*	353,864
3	Total	1,380,764
4	Revenue by selling in kg	1,770,400
5	Revenue by selling in traditional method	2,373,000
6	Gross returns by selling in kg (4)-(3)	389,636
7	Fixed cost	82,000
8	Net returns by selling in kg (6)-(7)	307,636**
9	Gross returns by selling using traditional methods (5)-(3)	992,236
10	Net returns by selling using traditional methods (9)-(7)	910,236**

Discussion

Standardized weights and measurements adopted in modern market systems aid the convergence of valuation of products through repeated transactions. The prevalence and continuity of traditional systems of measurements may not be just manifestations of resistance to the modern units. When a system of measurements is regularly used over a long period of time, it becomes integrated into the socioeconomic system. Thus, there is an issue of habit formation in the cognitive processes of its users (i.e., buyers and sellers), and hence replacing it with a newer system becomes difficult. Digging deeper, several factors could be playing a role in the persistence of these

systems in local economies led more often by women. Better economic returns, as identified in this study, is one of the major reasons. However, conventional economics alone cannot explain the continued use of a non-standard measurement system, despite it not being used in some nodes of the supply chain. This requires probing into the social economy, cultural and other factors that can explain the socially embedded nature of economic transactions. We observed a few of these aspects while collecting information on the weights and measurements in the supply chain and transaction nodes. Traditional transaction systems are prevalent where food systems are highly localized. Divisibility, need-based procurements, and trust in the availability of the food items – which discourage storage/accumulation – are some of the important observed factors associated with the persistence of the traditional measurement systems. Another probable reason for the continued use of traditional measurements by sellers of dried fish in Uttara Kannada could be the different timeline of economic development charted by the district, compared to Dakshina Kannada and Udupi which industrialized much earlier, on a larger scale, and at a faster rate. The industrialized regions have moved on to the modern weights and measurements. Would that mean that the traditional weights and measurements would also disappear from Uttara over a period of time? Probed further, these traditional weights and measurements used in the food supply chain nodes would tell more about the social, ecological and livelihood embeddedness of the local food systems and perhaps suggest a sustainable pathway.

* * *

Appendices

Appendix 1. Steps followed in primary processing and the corresponding weight loss (in grams) from 1 kg fish.

	Degutting	Salt	Washing	Drying	Net weight
Mackerel	-300	+400	-380	-180	540
Anchovies	-	+100	-300	-460	340
Lactarius	-	+340	-450	-290	600
Shrimps	-	-	-	-	-

Appendix 2. Quantity of fish procured per year by a typical dried fish processor.

No.	Item	Box	kg/Box	Total weight kg	Rate (₹/kg)	Amount
1	Mackerel	380	33	12,540	60	752,400
2	Lactarius	10	30	300	40	12,000
3	Anchovy	150	35	5,250	50	262,500
	Total	540		18,090		1,026,900

Appendix 3. Working capital for the production and marketing of dried mackerel.

Item	Unit	Price/unit (₹)	Price (₹)
Degutting (kg)*	30% (-ve)	60	225,720
Salt (kg)	4560 (+ve)	5	22,800
Labour (Hours/day)			
A) Degutting	380 hours	100	38,000
A) Washing	127 hours	100	12,700
A) Spreading	190 hours	30	5,700
A) Drying	127 hours	20	2,540
A) Assembling and packing	127 hours	20	2,540
Transportation	150 baskets	20	3,000
Total			313,000

26. NAVIGATING WEIGHTS AND MEASUREMENTS IN THE DRIED FISH...

Appendix 4. Working capital for the production and marketing of dried anchovies.

	Unit/box	Price/unit (₹)	Price (₹)
Degutting (kg)*	-	-	-
Salt (kg)	450	5	2,250
Labour (Hours/day)			
K) Degutting	-	-	-
L) Washing	50 hours	100	5,000
M) Spreading	150 hours	60	9,000
N) Drying	150 hours	60	9,000
O) Assembling and packing	150 hours	80	12,000
Transportation	45 baskets	20	900
Total			38,150

Appendix 5. Working capital for production and marketing of dried Lactarius.

	Unit/box	Price/unit (₹)	Price (₹)
Degutting (kg)*	-	-	-
Salt (kg)	60	5	300
Labour (Hours/day)			
U) Degutting	-	-	-
V) Washing	3.3 hours	100	334
W) Spreading	10 hours	60	600
X) Drying	10 hours	60	600
Y) Assembling and packing	10 hours	80	800
Transportation	4 baskets	20	80
Total Cost			2,714

Appendix 6. Fixed costs for a typical dried fish processor

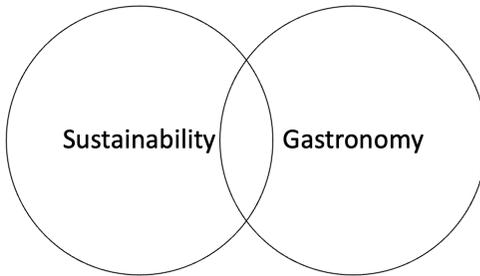
Expenses	Price (₹)
Construction of hut/shed	50,000
Drying mat	10,000
Baskets	5,000
Tarpaulin	4,000
Crates	8,000
Other costs	5,000
Total	82,000

27. Dried Fish as Sustainable Gastronomy: A Semantic Analysis of Ræstur Fiskur

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Gastronomy is sometimes called the art of food. It can also refer to a style of cooking from a particular region. In other words, gastronomy often refers to local food and cuisine. Sustainability is the idea that something (e.g. agriculture, fishing or even preparation of food) is done in a way that is not wasteful of our natural resources and can be continued into the future without being detrimental to our environment or health. Sustainable gastronomy, therefore, means cuisine that takes into account where the ingredients are from, how the food is grown and how it gets to

our markets and eventually to our plates.

(United Nations 2020)

Introduction

In 2016, the United Nations General Assembly proclaimed that June 18 of each year would be thereafter marked as ‘Sustainable Gastronomy Day’. This global observance aims to draw attention to the cultural dimensions of sustainable development, by associating gastronomy – the cultural rules and practices associated with taste for food – with development discourse surrounding food security, nutrition, and sustainable agriculture, particularly as formulated within the Sustainable Development Goals. While the proclamation of Sustainable Gastronomy Day was endorsed unanimously at the United Nations, commemoration of the day itself has been somewhat limited. Nonetheless, adoption of the term sustainable gastronomy in United Nations campaigns, Michelin Guides, and other mainstream spaces suggests important opportunities for engaging the connections between food and sustainability in public discourse.

Over the past several years, the Dried Fish Matters Partnership has sought to bring the world’s attention to dried fish, a staple in the diets of people throughout Asia and Africa, as a product that can go a long way toward achieving food and nutrition security through culturally appropriate means. We embrace the opportunity to draw connections between dried fish and sustainable gastronomy, particularly where this may provide occasions to celebrate the cultural significations that are attached to dried fish. This essay will explore the origins and semantic positionings of *sustainable gastronomy*, focusing on the webs of meaning connected to *ræstur fiskur* – a traditional fermented and dried fish from the Faroe Islands – as a product that has been incorporated into discourse on gastronomy, slow food, local cuisine, and sustainability. I propose that *sustainable gastronomy* is a usefully generative concept, as it invites users of the term to lay claim to it in ways that can produce and reshape value.

What is gastronomy?

The term *gastronomy* speaks directly to the cultural value of food. The *gastronomic* encompasses food that is held in high esteem – the opposite, perhaps, of fast food or comfort food, or that which we might consider food for the masses. The Oxford English Dictionary (OED) glosses gastronomy as “the art and science of delicate eating”, citing the earliest recorded example of English-language use in the private diary of colonial governor Sir Robert Thomas Wilson (1777-1849), who describes a dinner with Joachim Murat, the King of Naples, in his diary entry for April 1, 1814:

On the evening of the 29th, at half-past six, I was at the dinner-table with Murat. The banquet was according to all the rules of perfect gastronomy. The master's manners were very gracious. ... There was somewhat more of ceremony in the arrangement of the table than I ever witnessed before in royal fêtes.

(Wilson 1861, 2:345)

Wilson's description of 'perfect gastronomy' includes references to graceful manners, ceremony, royalty, and the abundance of a banquet, all of which imply more about the meal's circumstances and participants than about the food itself. The term *gastronomy* in this text appears to be borrowed from the French, where it occurs in the title of a poem by Berchoux – *La gastronomie, ou l'homme des champs à table, poème didactique en quatre chants* (1801) – a treatise written for the 'nouveaux riches' who lack taste in good food. The opening stanzas of the poem declare:

The gastronome is comparable to a schoolmaster who must teach all to particularly unenlightened pupils.

*You who have been, until today, strangers to my laws
Having followed your tastes without method and without choice*

*Who in your appetite ruled by habit
 Have no inkling of the art of which I have made my study
 My voice will dictate important lessons to you
 Come to my school, dear nurslings!*

(author's translation)

In these lines we see the *gastronome* introduced as a teacher or master, who presents eating practices guided by unregulated taste and habit as inferior to the learned, regulated practices of *gastronomy*. Berchoux articulates that gastronomy is a domain separate from base, innate food preferences; it corresponds to learned, deliberate tastes ('choices') and codified eating practices ('methods'), which might together be glossed as 'rules of good taste'. This meaning corresponds to the literal sense of the word *gastronomy* itself, compounded from the Greek terms *gastro* (stomach) and *nomos* (law or custom), suggesting rules or codified knowledge related to eating. Gastronomy does not simply describe taste for good food; it represents the rules of good taste, which are distinct from appreciation of the sensorial qualities of food consumed. In this regard, Bourdieu reminds us of art historian Pierre Francastel's distinction between *taste*, viewed as the "natural gift of recognizing and loving perfection", and *gastronomy*, viewed as the "set of rules which govern the cultivation and education of taste" – a 'grammar' of food, so to speak (Bourdieu 1984, 68). Francastel's dichotomy establishes the *gastronome* as belonging to a more pedantic order than those who are blessed with the 'natural gift' of taste; yet the *gastronome* provides value, like the narrator of Berchoux's poem, in conveying rules of guidance to those who are insufficiently refined to recognize poor taste.

Bourdieu frames this model of gastronomy by pointing out that the concept of *taste*, as an instinct with which we are individually born, operates to naturalize class difference by downplaying the role of capital and social positioning in shaping views on what 'refined taste' includes. Gastronomy codifies the manners and tastes of the dominant class, positioning refined and exotic foods consumed in elaborate settings – accessible mainly to those who

benefit from considerable social privilege – as superior to simple, filling meals. The gastronomic meal is ostensibly a celebration of good food; yet ‘good’ in this context refers to that which demands intensive investment of economic capital (the acquisition of expensive, high-quality ingredients), cultural capital (the refined upbringing that internalizes refined taste and manners), and social capital (the familiarity with other members of the privileged class, with whom to share a meal).



Figure 2. Google Books Ngram Viewer shows a rapid adoption of the term ‘gastronomy’ in the 1800s, which declined from the 1870s to a low around 1920. The term has very rapidly increased in usage from the 1980s to the present. Source:

<https://bit.ly/3r40mvP>

The contemporary notion of *gastronomy* emerged in France, inscribed within an effort to celebrate food culture as a form of cultural order through the institution of ‘legitimate gastronomic discourse’ mediated by texts such as gastronomic guidebooks, cookbooks, and food periodicals (Ory 1999). As we will see, the contemporary legitimizing and regulating (i.e., normative) role of gastronomic discourse persists in texts such as the Michelin Guide, as well as in discourse surrounding Slow Food and UNESCO. The second dimension of gastronomy to note, however, is that of *local food*, as reflected in the sense by which gastronomy describes the food culture or cuisine of a given place, and as implied by the format of food guides that build on the expectation

of gastro-tourism. The usage of the term *gastronomy* by Berchoux and his contemporaries in fact borrows, in this very sense, from Arcestratus's poem on local food entitled *Gastronomia* (γαστρονομία), which is mostly lost but is preserved through fragmentary quotations in Athenaeus (Arcestratos of Gela 2000; Nudell 2020). These surviving fragments recommend the quality of foods from specific locations: “*fruitful barley sifted clean grown entirely / From famed Eresus on the sea-girt knoll Lesbos, / lighter than ethereal snow*”; the “*rounded Thessalian roll ...*”

Indeed, gastronomy has been an important part of identity construction and nation-building, through the formalization of ‘national cuisine’. In France, for example, Pascal Ory (2001) asserts that “*food is one of the distinctive ingredients, if not the distinctive ingredient, of French identity*”. Tracing the history French gastronomy from the 18th century to the present, Ory takes the position that ‘gastronomy’ corresponds above all to a discourse, both critical and normative, as distinct from food or eating practices themselves. This gastronomic discourse appears to have emerged in parallel with the transposition of cooking from the private, feminine sphere of the home to the public, masculine sphere of the restaurant (Ory 1999; Ory, Taranto, and Coyault 2019). Following this argument, we could assert that gastronomy is distinguishable from everyday food practices insofar as it is fundamentally performative, representing an expression of cultural and class identity that is made in public spaces.

But gastronomic discourse does not necessarily homogenize; it also celebrates diversity and creative recombination. Ory points to the ‘invention’ of regional cuisines in Europe in the late 19th and early 20th centuries, but also the hybridization of French food culture through assimilation of foods from the colonies (Ory, Taranto, and Coyault 2019). Indeed, the rise of European gastronomic discourse is linked to the emergence of guides and maps, including various gastronomic maps (*cartes gastronomiques*), which attribute foods of notable quality and interest to geographic regions within the nation. These gastronomic cartographies clearly follow the lineage of Arcestratus, who as mentioned above catalogued the best sources of bread, wine, and other products in Greece in the 4th century BCE; and they anticipate

contemporary connections of gastronomy with *terroir* – that is, food of the land, which cannot be reproduced outside the assemblage of human, physical, and botanical elements in a unique region or landscape.

As an example, the map reproduced in Figure 1 was published in Gassicourt's *Cours Gastronomique* (1809), a text aiming to promote the incorporation of scientific knowledge into gastronomy, notably from the fields of medicine and chemistry (Private Collection of PJ Mode 2015). The map features an outline of the borders of France, along with major rivers but nothing else of the nation's physical geography; its canvas is mainly filled with clusters of line-drawn figures, labelled with the names of corresponding towns and prefectures, designed to represent the foods of each region. Thus Versailles is populated by rabbits and pheasants; Tonnerre, in the province of Champagne, by casks of wine and a bottle with an exploding cork; Brie by pots of cheese; and so on (see chapter 28 of Gassicourt, "Sachons un peu de géographie").

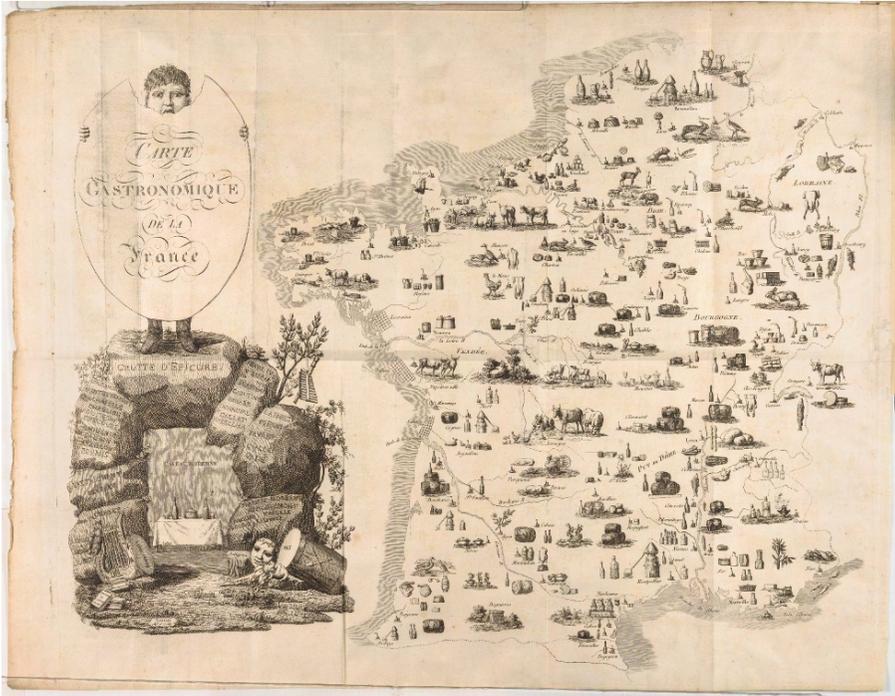


Figure 3. Gastronomic map of France (1809). The map uses visual illustrations to indicate various assemblages of wine barrels and bottles, fish, fowl, beef, cheeses, or brandy stills. Source: <https://bit.ly/3PyHGyh>. Public domain

Food and sustainable development: Gastronomy in the SDGs

The label *sustainable gastronomy*, as would be expected, refines *gastronomy* by associating it with sustainability discourse. The concept of *sustainability* corresponds essentially to the contemporary concept of *sustainable development*, coined by the Brundtland Commission (WCED 1987) to describe development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In this formulation, sustainable development incorporates two main premises: first, that development is essential to meet the basic needs of the world's poorest people;

and second, that there are limits to the extent to which we can continue to use the Earth's resources without depleting them. The second premise echoes the conclusions of the Club of Rome in its report *Limits to Growth* (Meadows, Randers, and Meadows 1972), whose computer simulation of future planetary scenarios suggested that a 'business as usual' approach to resource-intensive development would lead to "*sudden and uncontrollable decline in both population and industrial capacity*" by 2072. (The current 'planetary boundaries' framework refines this modelling approach further.) As we can see from Figure 3, English-language discourse on sustainability did not exist prior to about 1980, and did not really take off until the release of *Our Common Future*.

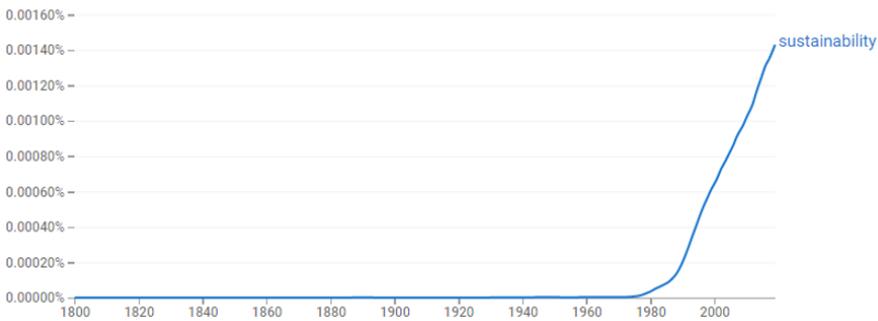


Figure 3. Google Books Ngram Viewer representation of adoption of the term 'sustainability'. Source: <https://bit.ly/3NPGvtf>

The explosion of sustainability discourse since that time has not resulted in consensus on what *sustainable development* should mean, however. Perspectives advocated by various groups and organizations range from the transformative calls for degrowth (e.g., Schumacher 2011; Hickel 2020) and recognition of the rights of non-human species (Escobar 2011) to more conservative approaches such as heightened investments in productivity-enhancing technologies and improved environmental accounting (e.g., the 'sustainable green growth' initiatives supported by the World Bank; see World

Bank 2021). Representing a moderate reformist approach to mainstream development, the UN Sustainable Development Goals (SDGs) were proclaimed in 2015 as a template for global development that would be more integrative – and less focused on the Global South – than the predecessor Millennium Development Goals, realigning the concept of *sustainable development* with the work of international and intergovernmental organizations (UN General Assembly 2015).

While the terms *sustainable* and *sustainability* have come to be used widely, if not indiscriminately, by individuals and organizations of all types, the United Nations and SDGs remain directly implicated in efforts to construct *sustainable gastronomy*. In the preamble to its resolution proclaiming Sustainable Gastronomy Day, the UN General Assembly (2016) begins by citing the *2030 Agenda* and SDGs, quoting from Article 36, which acknowledges the natural and cultural diversity of the world and asserts that “*all cultures and civilizations can contribute to, and are crucial enablers of, sustainable development*”. The proclamation then asserts the ‘interlinkage’ of sustainable gastronomy with “*the three dimensions of sustainable development, in achieving the Sustainable Development Goals*”. The ‘three dimensions’ referenced in this passage, known elsewhere as ‘three pillars’, refer to economic, social, and environmental aspects of sustainable development, which the SDGs explicitly aim to combine in a “balanced and integrated manner” (*2020 Agenda*, art. 2).

As critics have noted, while the mainstream three-pillar model progresses beyond a modernizing approach to development that exclusively privileges material growth, it still fails to address the cultural aspects of sustainable development; for this reason, we have seen calls to recognize culture as a ‘fourth pillar of sustainability’, as with the Agenda 21 for Culture (United Cities and Local Governments 2010). Culture is only mentioned twice within the 169 targets associated with the 17 SDGs: Target 4.7 calls for education for sustainable development that includes, inter alia, “*promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development*”, while target 8.9 calls for sustainable tourism that “*creates jobs and promotes local culture and*

products". Given this limited acknowledgement of cultural factors in SDGs, the association of *sustainable gastronomy* with the SDG framework provides a deliberate attempt to shift the terms of mainstream sustainable development to encompass the cultural.

The significance of this challenge to the SDGs cannot be overstated. Gastronomy, as food, interfaces directly with SDG 2: "*End hunger, achieve food security and improved nutrition and promote sustainable agriculture*". Yet none of the targets or indicators for SDG 2 reflect the importance of culturally appropriate food and foodways; instead, the targets focus entirely on material measures of development. The first set of targets aim to reduce food and nutrition insecurity, as assessed through undernourishment indicators (2.1.1), the Food Insecurity Experience Scale (2.1.2), and measures of stunting, malnutrition, and anemia (2.2.1-2.2.3). A second set of targets conveys the ambition to modernize and increase the efficiency of food production, measured in indicators such as the "Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size" (2.3.1), "Average income of small-scale food producers, by sex and indigenous status" (2.3.2), and "Proportion of agricultural area under productive and sustainable agriculture" (2.4.1), wherein 'productive and sustainable agriculture' is defined foremost as "*resilient agricultural practices that increase productivity and production*" (target 2.4, italics added).

It becomes evident in looking at these definitional texts is that sustainable gastronomy, despite being positioned alongside mainstream sustainable development discourse, remains at the margins of formally defined sustainable development. To the extent that it embraces traditional foods and celebrates eating as cultural well-being, sustainable gastronomy works against the grain of the productivist initiatives captured in SDG 2, encouraging the intangible cultural values – along with the immediate connections to place – afforded by small-scale, domestic production, over the efficiencies of global supply chains. More significantly, there is no space within the language of SDG 2 to promote local and Indigenous food systems as models for sustainability, other than within the limited scope of climate-resilient agriculture.

In practice, the most direct point of connection between sustainable

gastronomy and the SDGs has been made through SDG 12, “*Ensure sustainable consumption and production patterns*”, specifically target 12.3: “*By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses*”. Although this target is again worded in a way that assumes commercial-industrial food supply chains (as opposed to, for instance, farmer’s markets and home gardens), it also provides an opening for definitional engagement of what constitutes ‘food waste’ – including, crucially, the potential to recognize global supply chains themselves as wasteful.

The proclamation of Sustainable Gastronomy Day, in this context, might be seen as something of a ‘hack’ for actors seeking to align cultural objectives with the legitimating discourse of SDGs. How, then, did this proclamation come about?

Sustainable Gastronomy Day

The motion to create a Sustainable Gastronomy Day was brought forward by Peru, through the work of the Peruvian Gastronomy Society, APEGA. In a meeting of the Second Committee of the UN General Assembly in November 2016, the Peruvian delegate introduced gastronomy as “*a clear example of the catalysing role that culture could play in favour of sustainable development*”, suggesting that the holistic and interconnected nature of the SDGs was manifested in sites where food is shared: fields, markets, and kitchens (Second Committee, UN General Assembly 2016a). Peru argued that gastronomy was “*an ideal means to increase awareness of the integrated nature of sustainable development and mobilize all people, through their daily food consumption patterns, to contribute to the achievement of the Sustainable Development Goals*”. The proposed date was designed to be close to the agriculturally significant summer solstice. At a follow-up meeting of the committee, Peru asserted that such a day would “*highlight cultural diversity and raise awareness of culture as a catalyst for sustainable development*” and could also “*highlight the links between many Sustainable Development Goals and targets related to eating practices*” (Second Committee, UN General Assembly 2016b).

The draft resolution was endorsed unanimously by the General Assembly without debate, given the stipulation that all implementing activities would be funded only through voluntary contributions. The resolution called upon UNESCO and the FAO to facilitate the observance of Sustainable Gastronomy Day in collaboration with other UN Organizations.

The UN Department of Public Information created a web page for Sustainable Gastronomy Day in 2017, which summarizes the various forms that sustainable gastronomy has been interpreted and promoted at the international level through UNESCO, FAO, and other branches of the UN system (<https://www.un.org/en/observances/sustainable-gastronomy-day>). In a notable departure from the language of SDG 2, which calls for increased agricultural productivity to meet global food and nutrition needs, official UN contributions to sustainable gastronomy discourse include appeals to consume local food, by extension foods that are locally in season and are likely to be prepared using local or traditional methods. On the one hand, these texts communicate an implicit recognition of Slow Food and similar transformative initiatives, aiming to reclaim food from the global system. On the other hand, the texts also communicate that sustainable gastronomy belongs to the realm of individual consumer acting within a market food system.

The ‘Food Hero’ campaign, linked from the UN Sustainable Gastronomy Day web page, pursues an arguably neoliberal logic by positioning sustainability as a form of self-improvement, listing 11 things that individuals can do to help “*make sure that everyone, everywhere has enough affordable, safe and nutritious food*” (<https://www.un.org/en/actnow/food-hero>). Individuals are called up to cut food waste, eat healthier meals, shop with reusable bags, save water, and improve their knowledge about food systems, among other actions demonstrating self-improvement and responsibility. Whereas food and nutrition security are presented in the SDGs as governance issues, here the claim is made that individual food choices will help determine impacts on health, environment, and the livelihoods of food producers.

Elsewhere, a Sustainable Gastronomy Day social media card urges the public to “eat local, seasonal foods” (Figure 4). Posting this card on Twitter,

the official UN account presented a call to action originally linked to World Food Day, with the suggestion that readers try sustainable recipes and cut food waste in commemoration of Sustainable Gastronomy Day 2021 (United Nations [@UN] 2021). Once again, we can read into these texts an attempt to combine individual ‘responsibility’ with calls for transformative collective action: while the immediate call to action shared in the Tweet connects to SDG target 12.3 (reducing food waste), the language of the social media card itself (“take action; eat local, seasonal foods”) belongs to an activist discourse more closely aligned with Slow Food than the SDGs.



Figure 4. Social media card for Sustainable Gastronomy Day 2021

The various campaigns affiliated with Sustainable Gastronomy Day bring gastronomy into dialogue with several concepts related to sustainability. I highlight five specific campaigns, with their related sustainability concepts, in Table 1 below. (The highlighted campaigns are all listed as part of the broader ‘Food Hero’ initiative.)

Table 1. Sustainable Gastronomy campaigns

Campaign	Actions	Concepts
Sustainable Sundays	Eat meals together on Sundays made from locally sourced, sustainable ingredients	<ul style="list-style-type: none"> • commensality • consumer choice • local food • seasonal food • minimal inputs in agriculture • diverse foods • whole foods • waste reduction
ActNow Climate Campaign	Cook from sustainable recipes prepared by chefs and food educators	<ul style="list-style-type: none"> • consumer choice • reduced meat consumption • traditional foods • food diversity • <u>gastronomy as food design</u>
Good Food For All	Share on social media a one-minute video on the topic of what “good food” means to you	<ul style="list-style-type: none"> • stakeholder needs • good food
Climate Action Superheroes	Children, with the help of an adult, complete an activity book about sustainable foods	<ul style="list-style-type: none"> • local food • reduced meat consumption
A-World	Use an app to track personal sustainability and earn points for completing challenges	<ul style="list-style-type: none"> • environmental accounting • waste reduction

These campaigns suggest models for various types of actions that might position dried fish as sustainable gastronomy. The first of these initiatives, for instance, invites people to eat #GoodFood4All on ‘Sustainable Sundays’ as an action that “*recognizes the emotional and cultural connection we have to food as a source of love and livelihoods while reflecting food’s impact on all areas of our lives*”. Individuals are called upon to consume foods that are produced locally (or in their own gardens), in season, grown with minimal inputs, diverse, whole, and sustainably sourced. The guide for consumers specifically recommends “abundant and sustainably sourced” fish, including anchovies and sardines – two of the major species used in dried and fermented fish production. The guide also recommends buying in ways that reduce waste, such as in bulk or with minimal packaging. Traditionally dried and fermented fish clearly meet the ‘sustainability’ criteria set out in this initiative, insofar as they are locally sourced, unpackaged (or minimally packaged), stored without needing

refrigeration or freezing, and are often made with small fish that are abundant and eaten whole. ‘Sustainable Sundays’ can, in this sense, serve as an opening for the positioning of dried fish as a climate-friendly food, supported by an invitation to post dried fish meals using the campaign hashtag.

Elsewhere within the UN system, UNESCO has undertaken several initiatives related to sustainable gastronomy, focusing primarily on local food as cultural heritage. Somewhat fittingly, given the origins of gastronomy discourse in France, one of the first formal recognitions of gastronomy as heritage is the “gastronomic meal of the French”, inscribed on the Representative List of the Intangible Cultural Heritage of Humanity (UNESCO 2010), which emphasizes the role of French culinary traditions in maintaining sociality. The inscription describes a connection to festive celebrations of “births, weddings, birthdays, anniversaries, achievements and reunions”, asserting that the meal “*emphasizes togetherness, the pleasure of taste, and the balance between human beings and the products of nature*”. Here ‘gastronomy’ refers not just to the meal itself, but also to the associated practices of creating and selecting recipes, purchasing local ingredients, dressing the physical space, sequencing of the courses, and conduct during the meal. The inscription further describes “*individuals called gastronomes who possess deep knowledge of the tradition and preserve its memory watch over the living practice of the rites, thus contributing to their oral and/or written transmission, in particular to younger generations.*”

The concept of sustainable gastronomy is applied more directly in the ‘Cities of Gastronomy’ project, one of the certifications awarded to cities to recognize their world importance in a specific area of culture (UNESCO 2021). Each City of Gastronomy must meet seven criteria, which do not explicitly define ‘gastronomy’ but nonetheless associate it with local knowledge and social interactions, including: community, restaurants, chefs, festivals, and markets; traditional cooking knowledge and practices; and local and endogenous ingredients. As such, gastronomy in this initiative is viewed as involving foods that are tied to place, as they have been for many generations, and that continue to be celebrated through shared cultural activities (restaurants, markets, etc.) that facilitate production and

consumption of meals.

Normative concepts and semantic categories: Theoretical notes

My discussion so far leads me to suggest that *gastronomy*, *sustainability*, and *sustainable gastronomy* all originate, and continue to be used, as performative terms in discourses that aim to transform the social world. In describing these terms as ‘performative’, I follow other anthropologists and social theorists in identifying these as forms of communication that create social action, as distinct from merely describing the world. First introduced in the linguistic theory of JL Austin (1962), the concept of performativity has been widely applied to interpret the power of both linguistic and non-linguistic communications, including most famously Judith Butler’s work on how we reproduce or ‘do’ gender through speech and body practices (Butler 2002). On one level, the work of creating the 231 indicators for the UN Sustainable Development Goals aligns with overtly normative goals, as an explicitly definitional exercise aiming to generate an integrative descriptive framework for sustainable development. But this work is not simply a matter of refining the constative language available to us for describing the world, by measuring how ‘sustainable’ we are. It is deeply performative insofar as it calls for transformative social action; as a metalinguistic discourse, focused on creating working definitions for the next 15 years, it mobilizes reflection on political, environmental, and economic possibilities. Similarly, *gastronomy* is performative insofar as it actively constructs distinctions between different categories of food and eating – high-class and low-class, local and foreign/global, special and everyday, public and private – which in turn organize social interactions.

In its application, a performative term invites deliberate, normative or aspirational declarations. Announcing that a commodity or practice belongs to the category of *sustainable gastronomy* communicates a statement of value; such a statement automatically implies both *this food is valuable (as it is associated with sustainable gastronomy)* and *we value sustainable gastronomy*

(as it is associated with this food). These two claims present a logical circularity if taken in a strictly constative sense, however in a performative sense they operate to create mutually reinforcing semantic association. Such statements do not operate in isolation but build up further meaning through chains or clusters of semantically meaningful linkages, which I will attempt to engage in the analysis that follows, focusing here on connections between *sustainable gastronomy* and *dried fish*.

In the section that follows, I explore some possibilities of semantic analysis as an approach to examining the interconnections between concepts that are described through language. As a general field, semantics refers to the branch of linguistics and linguistic anthropology that is concerned with interpreting and analyzing the meaning of *signs*, which can be taken to be words, phrases, actions, visual symbols, or anything else that is used purposefully to communicate meaning. Within this field, some linguists have attempted to explicate culturally significant concepts or ‘keywords’ by breaking them down into groups of simpler concepts, sometimes described as ‘semantic primes’ (Mullan, Peeters, and Sadow 2020). My own approach, taken within this vein, focuses on what Goddard has described as “functional collective superordinates” (Goddard 2017) – conceptual categories, like *furniture* or *vegetables*, which group diverse elements that all have something in common but are not inherently defined by their shared properties within that particular set, and as such would not be considered part of a knowledge taxonomy. The principal innovation I am attempting to bring to this analysis is an exploration of how these collective categories are not simply used communicatively as shared units of meaning, but are also actively constructed through deliberate, performative acts expressing their inclusion in politically meaningful semantic groupings.

A semantic category, in this analysis, is a conceptual category that is described by a distinct name or natural language term and is applied to a set of phenomena or sub-categories that are assumed to share one or more properties in common. For example, the term *dried fish* represents a semantic category that includes any possible instances of fish that are air-dried, smoked, or salted and that can be stored without refrigeration.

The members of this category may be individual fish or, alternatively, sub-categories that represent more specific categories of dried fish such as *bacalhao* (Portuguese salt cod) or *ræstur fiskur* (Faroese air-dried fermented fish). In natural language, we use terms such as *fish* or *dried fish* to describe objects with specific features: in common usage, a *fish* might be any animal that lives exclusively in the water, while a *dried fish* might be a fish that has been caught and dehydrated by humans for storage as food. But outside of technical contexts, such terms are used without reference to a precise definition; instead, we find that they are often created implicitly, by associating objects with a term that emphasizes their shared characteristics but leaves it up to the participants in the communication to know or deduce what those shared features are. A fish lives in the water, but must it also swim, have fins, and be able to breathe underwater? Modern scientific usage excludes invertebrate crustaceans, molluscs, and sea-living mammals from the category of *fish*, yet the inclusiveness of the term may vary in other contexts. *Dried fish* may refer in a very narrow sense to fish that has been dehydrated, but – as our own literature survey on dried fish has shown – it is not automatically clear whether the term should extend to shrimp and other seafood, or whether there should be a distinction between fish that are sun-dried, freeze-dried, salted, smoked, fermented, or a combination of those techniques (Belton et al. 2022). (*Ræstur fiskur*, the ultimate subject of my analysis below, straddles two of these categories as a product that is partly fermented and partly dehydrated.)

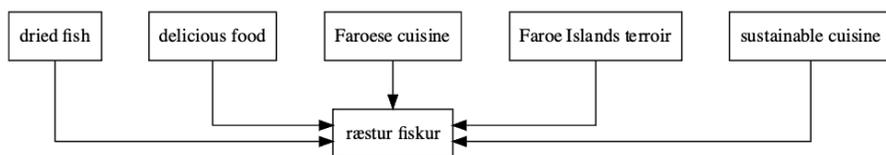


Figure 5. Examples of semantic categories linked to *ræstur fiskur* through performative statements

Negotiating the boundaries of semantic categories, as suggested by the

example from our own literature survey, can be a major part of our work in the sciences and humanities, whereby we attempt to refine or extend the language available to us in describing the contemporary world. Language work is not always technical, however, as we also define language for political purposes by proclaiming associations with categories of value. In announcing that a product or process is *sustainable*, for instance, we draw positive value from the concept of *sustainability* but also contribute to redefining that concept, by further extending the set of objects that it describes. This communicative act differs from a statement of logical membership, as it does not assert that something is a member of a given category based on predefined, definitional or taxonomic criteria for that category. Instead, it expects the semantic category's definition to be adapted, if necessary, to accommodate the new element. To give an example, we can take five statements of membership of *ræstur fiskur* in different types of semantic categories, as illustrated by Figure 5:

- (1) *ræstur fiskur* is dried fish
- (2) *ræstur fiskur* is delicious
- (3) *ræstur fiskur* is an element of Faroese cuisine
- (4) *ræstur fiskur* is a product of Faroese terroir
- (5) *ræstur fiskur* is an element of sustainable cuisine

Statement (1), *ræstur fiskur* is *dried fish*, is a relatively straightforward assertion that is unlikely to be contested, given that *ræstur fiskur* is a fish and it is dehydrated. By contrast, statement (2), *ræstur fiskur* is *delicious*, requires the addressee to contemplate extending the category of 'delicious foods' to incorporate a product that, subjectively, may or may not be enjoyable. Statement (3), *ræstur fiskur* is *an element of Faroese cuisine*, is not likely to be challenged on simple logical grounds – the fish does, after all, pertain to the geography of the Faroe Islands – but this statement presents implications for the common properties of elements contained in the semantic category *Faroese cuisine*, by contributing an emphasis on fermented or air-dried seafood. Statement (4), *ræstur fiskur* is *a product of Faroese terroir*, involves two claims: first, that the Faroe Islands constitute a unique social-geographic

environment, or *terroir*, that influences the flavour of foods produced within it; and second, that *ræstur fiskur* manifests the qualities of that *terroir*. As a more complex claim, this statement might ultimately be intended to draw upon the concept of *terroir* to advance the position that Faroese gastronomy and natural environment are of unique value and, therefore, worth promoting and safeguarding. The precise geographic features and flavour profile associated with this *terroir* are deliberately kept indeterminate, such that the addressee is invited to do the work of imagining the complex relationships between food, culture, and place. Finally, statement (5) asserts that *ræstur fiskur* is *an element of sustainable cuisine*, a claim that might be associated with evidence supporting any of several different approaches to sustainability – reducing carbon energy cost by producing food locally and using traditional food storage methods, for instance, or maintaining biodiversity by prioritizing non-industrial foods. The claim “*ræstur fiskur* is *sustainable*” is superficially constative but, like the other claims in this series, is ultimately more important as a performative communicative act, one that contributes to generating the concept of *sustainability* itself.

These five examples illustrate several of the key principles of semantic categories, which I summarize as follows.

1. Natural language terms are semantic categories, containing objects with shared properties.
2. A semantic category may be defined *explicitly* (membership deduced from stated criteria) or *implicitly* (criteria induced from the shared properties of members).
3. Declarative statements of the form *Object A belongs to semantic category B* may be communicated deliberately with the intention of associating the value of B to A.
4. Conversely, declarative/performative statements can be made with the intention of creating semantic category B out of the aggregated value of elements referenced in the declarative statements. In other words, such statements deliberately associate the value of A to B.

Following on these last two principles, we can also describe the indirect commutation of shared properties between elements in a semantic category. For example, we can take the following three overlapping semantic categories, *Faroese cuisine*, the Slow Food Foundation's *Ark of Taste*, and *dried fish* (Figs. 6-8).

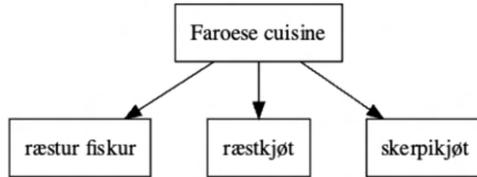


Figure 6. Some elements of the semantic category *Faroese cuisine*. *Ræstur fiskur* is Faroese fermented and dried fish; *skerpikjöt* is a similarly prepared fermented and dried mutton; *drýlur* is a cylindrical unleavened bread.

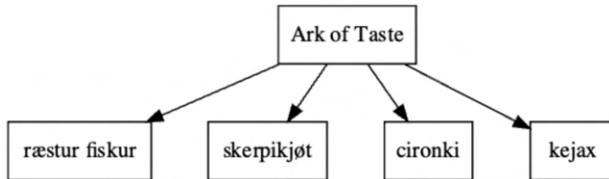


Figure 7. Some elements of the semantic category *Ark of Taste*. The *Ark of Taste*, an initiative of the Slow Food Foundation, is a registry of local and traditional foods that are considered important to biodiversity. *Cironki* is a dried, salted fish product specific to southwestern Macedonia; *kejax* is a Senegalese dish made by braising, salting, then sun-drying sardinellas

DRIED FISH MATTERS

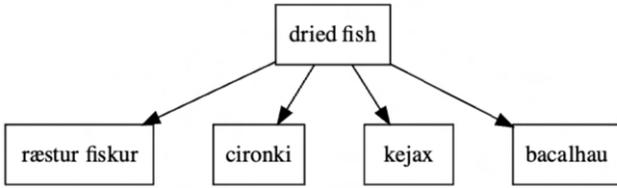


Figure 8. Some elements of the semantic category dried fish. Bacalhau is salted and dried cod, considered the national dish of Portugal

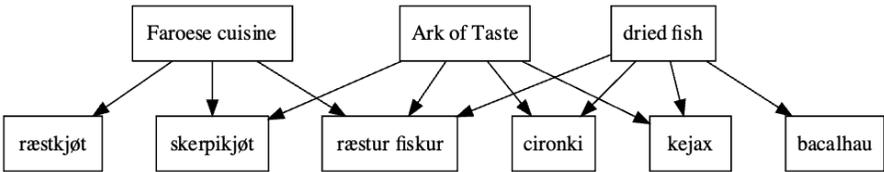


Figure 9. Overlaps between the semantic categories Faroese cuisine, Ark of Taste, and dried fish

Transmission of semantic values across these relationships takes five main forms. First, through a process of **parent inheritance**, there is a transmission of semantic values from a parent to child category. For example, *ræstur fiskur* inherits the distinct properties of *Faroese cuisine*, *Ark of Taste*, and *dried fish* by virtue of belonging to all three of those categories (fig. 9). By way of these semantic connections, the product assumes an importance as food (*dried fish*), as cultural object (*Faroese cuisine*), and as a product of human-environmental interactions that preserve biodiversity (*Ark of Taste*).

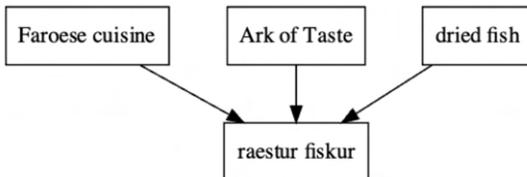


Figure 10. *Ræstur fiskur* as inheriting the properties of three parent semantic categories

Second, through a process of **child inheritance**, semantic categories can inherit the properties of their own members. The category *dried fish* in this example might be conceived in terms of the shared properties of its members, including *ræstur fiskur*, *cironki*, *kejax*, and *bacalhau*: these are all dried in the air, either hung in the shade (*ræstur fiskur*) or pre-treated by braising or salting then set out to dry in the sun (*cironki*, *kejax*, *bacalhau*); all are soaked or boiled in water prior to consumption; all are traditional foods that are considered culturally significant to those who prepare and eat them, and whose consumption is primarily associated with a very localized cuisine; and all are produced as a means of storing locally available fish using low-cost methods, without refrigeration or canning, for domestic consumption.

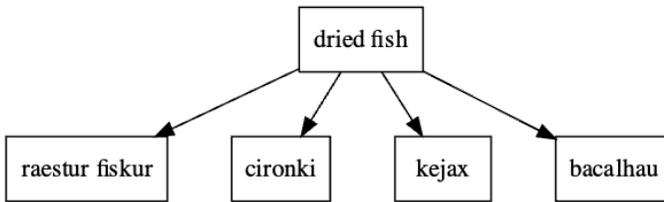


Figure 11. Inheritance of properties from sibling members in the semantic category dried fish

From these generalizations, we can recognize dried fish as a local, traditional, culturally important, domestic food – in distinction, for example, to industrially processed foods, street foods, or other categories. These properties are to some extent shared through a third, indirect form we can call **sibling inheritance**, whereby significant properties of one member of a category become apparent as a result of being shared with other members of the same category. In this sense, we might say that *ræstur fiskur* lends the semantic property of ‘cultural importance’ to dried fish, but that this

property is only associated with dried fish to the extent that it is shared by other members of the same category – and in turn, the cultural importance of *ræstur fiskur* as *dried fish* is reinforced through its own membership in that category. These products effectively transmit the values of dried fish toward higher-order semantic categories, through a fourth form of value sharing, **multi-generational direct inheritance**:

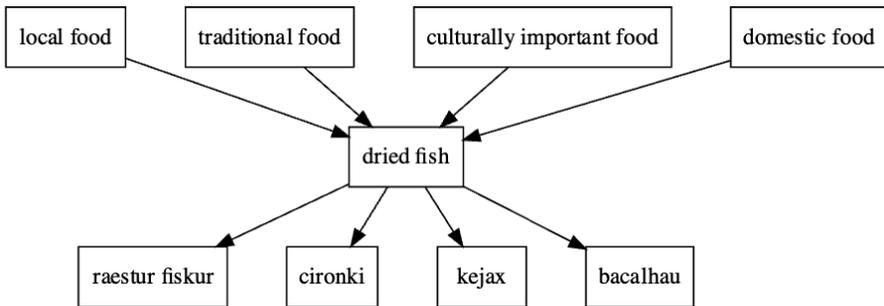


Figure 12. Multi-generational inheritance of semantic properties in the category dried fish

We might further postulate a fifth form of semantic property sharing, **cousin inheritance**, whereby there is a sharing of properties among otherwise unrelated objects, such as *ræstur fiskur* and *ngari* (fermented fish from Manipur, India). Both of these products inherit the properties of the semantic category *traditionally preserved fish* – types of products that are produced using locally adapted forms of common food processing technologies, with locally available ingredients, and consumed locally – as these properties extend both upward to the ancestors and downwards to the descendants in this semantic tree.

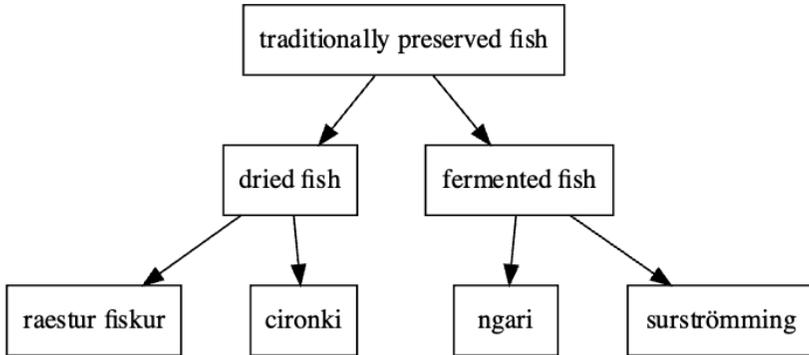


Figure 13. Multi-generational inheritance of semantic properties in descendants of the category traditionally preserved fish

This model of semantic inheritance suggests that the meanings of any particular object – taken as the aggregate properties of the semantic categories to which that object belongs – can be modified through changes to the membership of directly or indirectly related semantic categories. Adding a product such as *ræstur fiskur* to a controlled category, such as the Slow Food Foundation’s *Ark of Taste*, adds to the meaning of *ræstur fiskur* itself, while also introducing subtle changes to the *Ark of Taste* as a higher-order category – whose overall meaning will shift, for example, as more diverse products are added from different parts of the world. Indirectly, this change will also contribute to subtle changes in the semantic values of other products associated with the *Ark of Taste*, including both child members of the category and its ancestors such as *Slow Food*.

Mapping semantic categories: Ræstur fiskur

As a mapping exercise, building on these principles, I start out with *ræstur fiskur*, an element of interest within the *dried fish* class which I know to have indirect associations with sustainable gastronomy through its inclusion in meals at the Michelin-starred KOKS restaurant as well as listing in the *Ark of Taste*. I will explore a selection of semantic connections that have

been expressed performatively as a means of establishing value related to sustainable gastronomy. My procedure involves mapping category memberships according to several interlinked semantic clusters connected with *ræstur fiskur* and *sustainable gastronomy*, looking for evidence of membership claims that are communicated through language or other forms of association (e.g., associating *ræstur fiskur* with the semantic category *haute cuisine* by serving it in a Michelin-starred restaurant). For simplicity, this mapping focuses on the following key nodes:

- 1) terroir
- 2) Slow Food
- 3) New Nordic Cuisine
- 4) gastronomy and the Michelin Green Star

This mapping is intended to be exploratory rather than rigorous, as a means of discovering indicative relationships and identifying ways that meanings can be generated through performative associations with other semantic categories.



Figure 14. *Ræstur fiskur* hung out to dry. Source: Wikimedia Commons, File:Dried_fish_in_the_Faroe_Islands_2010.JPG, EileenSanda, 2010; CC BY-SA 3.0 license. The image contributor provides the following description:

Fish hanging to dry just under the roof of a family house in the Faroe

Islands. It is raining quite often in the Faroe Islands, so the fish needs to be hanged out under some kind of shelter for the rain. The fish will hang there for a couple of weeks until it is dry, then it must be beaten with some kind of a sledge hammer in order to get softer, or else the fish meat will be too hard to eat. In older days there were no freezers, so the fish had to be stored somewhere until eaten, now it is possible to freeze the fish after the drying period, so it can last longer. But dried fish can also be of good quality for several months after it has been dried. It must be stored in a cool and dry place. Many Faroese households have hjallur where they can store dried sheep meat, dried fish and dried whale meat. The hjallur is built by timber, and it has open spaces between each timber in order for the wind to blow through the building. The building is mainly next to the family house or sometimes even built together with the family house. Fishermen who work on board Faroese trawlers are allowed to hang some of the fish which they catch up to dry, and then they can take it with them home for their family. These fishes are said to have a special salty taste because of the salty breeze of the sea. Fishes which are dried on land but on a house or hjallur which is close to the sea also gets the special salty taste of the sea.

Terroir

Terroir refers to the character of a product as shaped by a complex combination of local geographic factors. These factors are understood to be outside of producers' control, with the result that the unique qualities of the product from a specific area cannot be reproduced elsewhere. Factors might include climate and soil type, but also the unique assemblage of species in a given site – including the microorganisms involved in fermentation. The concept of terroir is closely linked to the 'appellation d'origine contrôlée', a scheme introduced in France to protect the location-based branding of wines, cheeses, and other food products, as evoked by the gastronomic map presented above. For example, the controlled wine appellation 'Côtes du Rhône' designates wine that is produced within the Rhône wine region, which

is marketed as including a ‘mosaic’ of individual terroirs whose wines are uniquely influenced by steep Roman-era terraces that continue to be used on the sloping ground of the northern Rhône Valley, and which allow the soil to capture and store heat from the sun; the continental climate; and the Mistral winds, which affect cloud cover to produce an ‘ethereal’ light and protect grape buds by preventing early break and keeping the air dry (Côtes du Rhône 2021). As Trubek (2008) has described, terroir amounts to a naturalization of cultural identity by linking culture and gastronomy to place.

Similar claims have been made about the connection between Faroese foods and Faroese terroir. The Faroe Islands (Figure 15) are a self-governing territory of Denmark, consisting of 18 islands located in the North Atlantic Ocean between Scotland and Iceland, with a human population of 53,000. Continuous settlement of the Faroe Islands dates from the arrival of Norse settlers in the ninth century CE. Owing to the insular location of the Faroe Islands, the Faroese have retained a relatively intact local language and culture, as well as a reliance on local foods such as fish (Svanberg 2015). Among these traditions is that of preparing *ræstur fiskur*, a fermented and partially air-dried fish (Figure 14). Generally made from Atlantic cod, saithe, or haddock, the fish are gutted and beheaded then hung outdoors, unsalted, in pairs under the eaves of a fermenting house (*hjallur*) for two or three weeks, in dry weather, until partially dry. The fish are prepared by cooking whole in salted water, and traditionally eaten with whale blubber or other animal fat and boiled potatoes. The fish are typically processed at home and eaten as part of ordinary meals. While the smell and flavour of *ræstur fiskur* are considered disagreeable to some outsiders, most Faroe Islanders view *ræstur fiskur* positively, having grown up with the taste and associating it with local culture (Svanberg 2015).

The Faroe Islands arguably constitute a terroir shaped by its subpolar oceanic climate, which lends itself to dried and fermented foods produced at cool temperatures with exposure to wind, notably *ræstur fiskur* (dried and fermented fish) and *skerpikjöt* (dried and fermented mutton). These food products are in turn made from locally available fish and sheep, also part of the Faroe Islands geography and by extension its terroir. Faroese cuisine, as

a category of cultural practices related to food preparation, derives from the foods developed in adaptation to the Faroese climate, and is also a constituent part of the terroir. In this sense, we see a combination of geographic factors – climate, fauna, and human activity – that generate the specific conditions required for ræstur fiskur to exist (Figure 16).

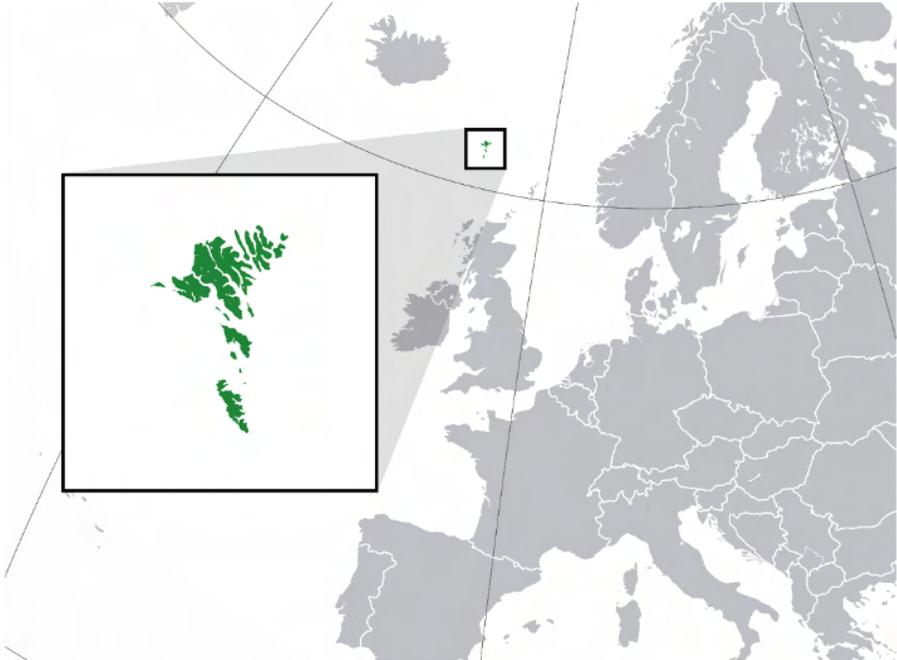


Figure 15. Location of the Faroe Islands. Based on Wikimedia Commons, File: Europe-Faroe_Islands.svg

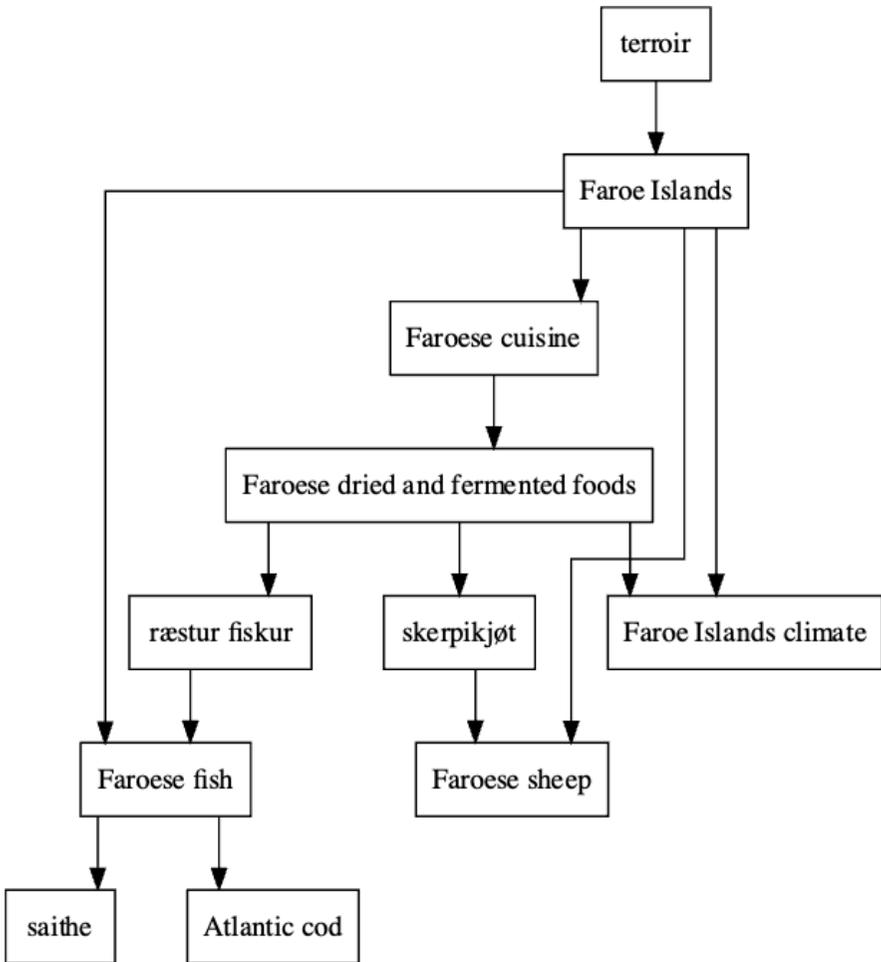


Figure 16. Elements of the Faroese terroir ('Faroe Islands'). The terroir combines elements of physical and human geography, in the forms of climate and cuisine, as well as flora and fauna (fish and sheep species). Food products originating in the terroir – *ræstur fiskur* and *skerpikjöt* – encompass elements of the terroir as their ingredients, while themselves being part of culinary practices that are encompassed by the geography of the region. Faroese dried and fermented foods are products of the Faroe Islands climate (wind, humidity, and temperature); consequently, this category of foods includes not its taxonomic elements – i.e., specific preparations like *ræstur fiskur* – but also the local climate as a conceptually defining element of

those foods. Several of the other semantic relationships depicted in this figure are also taxonomic (e.g., saithe and Atlantic cod as elements of Faroese fish, a category with clear membership criteria). The elements of the category Faroe Islands, in contrast, represent components of an open assemblage that includes, beyond just place and climate, human culture (cuisine) and biological species. Similarly, Faroese fish and Faroese sheep are not represented as taxonomic sub-classifications of ræstur fiskur and skerpikjøt, but rather as semantic components of those two foods: Faroese fish is a constituent part or ingredient of ræstur fiskur rather than the inverse.

The concept of terroir is deliberately evoked in the New Nordic Cuisine, described in further detail below, as highlighted in the presentation of ræstur fiskur and other local foods by KOKS restaurant. Similar to wine regions for the French, the New Nordic Cuisine positions Nordic people as ‘native’ to a cultural landscape; the assumed fact of being more wild, or close to nature, in the process becomes part of the Nordic identity (Hermansen 2012). In the attempt to situate ræstur fiskur in relation to broader discursive concepts like *terroir*, we also see an effort to enhance the legitimacy and value of the product by association with others in the same semantic category. This is illustrated in figure 17:

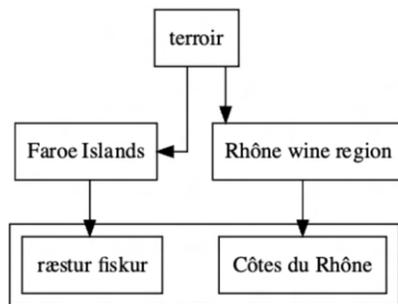


Figure 17. Cousin inheritance of semantic properties – ræstur fiskur and Côtes du Rhône wine are both products of terroir, and through that equivalence are implied to share value

As a simplification of Figure 17 above, here we represent *ræstur fiskur* directly as a product of the *Faroe Islands* qua *terroir*. Significantly, through this construction the *Faroe Islands* acquire an equivalency to other members of the semantic category *terroir*, such as the much better-known *Rhône wine region*. By inheritance of the properties associated with *terroir* via products such as *Côtes du Rhône wine* – quality, unique relationship to geographic features, high cultural and commercial value, connection with cultural traditions that have existed from time immemorial, and so on – *ræstur fiskur* is not only represented as equivalent to a bottle of *Côtes du Rhône* wine, but also shares in its prestige and claims to global importance. Importantly, this equivalency would not be possible if regions such as the Faroe Islands or the Rhône Valley were marketed individually as unique cultural landscapes; the statement of membership in a broader category of similar places operates as a strategy for turning local concerns into global ones.

Slow Food and gastronomes

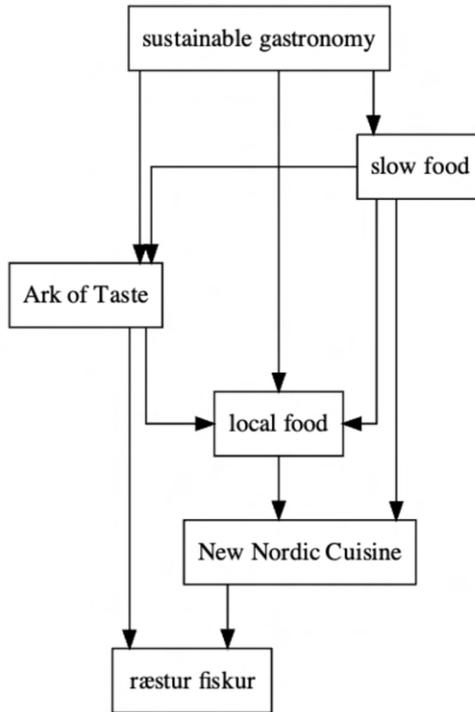


Figure 18. *Ræstur fiskur* as local food. *Ræstur fiskur* has been associated directly with the categories of *Ark of Taste* and *New Nordic Cuisine*, both of which are positioned as members of the category *slow food* and are situated in relation to *local food*. The *Ark of Taste* and *slow food* both encompass (potentially) all *local food*, while conversely the *New Nordic Cuisine* is a subset of *local food*.

Ræstur fiskur is brought into the Slow Food movement through its incorporation into the Slow Food Foundation's *Ark of Taste*, and indirectly through the *New Nordic Cuisine*. Explicitly listed in the *Ark of Taste* registry, *ræstur fiskur* is claimed by the *Slow Food* movement which, in turn, claims to incorporate into *sustainable gastronomy* – also described in this context as 'eco-gastronomy' or 'neo-gastronomy', the latter defined as "a multidisciplinary approach to food that recognizes the strong connections between plate, planet, people and culture" (Slow Food 2015b). *Slow Food* specifically emphasizes *local food*, under the first of its three tenets – Good, Clean, and Fair – calling for "a fresh and flavorful"

seasonal diet that satisfies the senses and is part of our local culture” (see also Slow Food 2015a).

The *Ark of Taste* is an initiative of the Slow Food Foundation for Biodiversity, consisting of an adjudicated online database that currently approaches 6000 small-scale, local, and mostly traditional food products and breeds of plants or livestock of high quality from around the world (Slow Food Foundation for Biodiversity 2021). The project aims to help safeguard local food heritage by promoting awareness of products contained within the registry, and by extension encourage the survival of agricultural biodiversity and small-scale production systems. The choice of the term ‘ark’, while not explained explicitly in the materials accompanying the online database, in evoking the Biblical story of Noah’s Ark appeals to the sense that food and agricultural biodiversity is at immediate risk of being lost in the flood of industrialization – implying that those who contribute to preserving elements in the Ark are joining a noble effort that may rescue the world. Products included in the Ark are expected to be promoted by local Slow Food organizations and their supporters, through events or commercial initiatives.

Although the *Ark of Taste* initiative itself does not use the terms ‘sustainability’ or ‘gastronomy’ to describe the effort, the Ark is associated with sustainable gastronomy in both direct and indirect ways. The Ark of Taste has been included in publications and events on sustainable gastronomy, such as at a panel in the 2018 Philippine Sustainable Gastronomy event (Ozaeta 2018). Further, as noted at the bottom of each page in the online catalogue, the Ark is being ‘filled’ by students at the University of Gastronomic Sciences at Pollenzo, an institution founded by the Slow Food Foundation, which offers programs in gastronomy that focus heavily on culture and sustainability. The University’s mission statement indeed evokes a view of the *gastronome* as an emerging professional class:

The university forms gastronomes, new professional figures with multi-disciplinary skills and knowledge in the fields of science, culture, politics, economics and ecology of food, working to apply them to production, distribution and sustainable consumption.

(University of Gastronomic Sciences at Pollenzo 2021; emphasis in original)

Gastronomes are positioned, in this program, as a vanguard in the struggles identified in the University's mission: "*renewing farming methods, protecting biodiversity, and building an organic relationship between gastronomy and agricultural science*".

The selection process for the Ark itself embodies principles of distinction associated with gastronomy. Ariane Lotti (2010) describes her observation of the process of selecting a type of French cheese for inclusion in the Slow Food 'Presidium' product label, a sister initiative that creates production standards and value chains for endangered products within the Ark:

Two Slow Food employees had traveled to France, met with producers, collected the information about the product, and brought back a dozen or so samples of the cheese from two different producers. The cheese had already met certain guidelines but had yet to be tasted. A group of four Slow Food employees, among whom was the president of the organization's Biodiversity Foundation, got together on the office's rooftop and tasted the samples of cheese made by different producers and which had been aged for different lengths of time. As each person tried a piece of cheese from the samples, notes were written down about the different characteristics of the samples. Some had too thick a rind, some did not have a strong enough flavor, and others tasted soapy. After discussion, the group decided on the sample that appealed to everyone's taste buds and began to discuss the logistics of marketing and selling the cheese outside of its region.

(Lotti 2010, 77)

What particularly stands out in this account is the important role of expert gastronomes in determining which products to market, based on expert criteria of taste. The founder of Slow Food, Carlo Petrini, has himself been described as an 'eco-gastronome' (*Toronto Star* 2003). While the ultimate

goal of this initiative is to safeguard food heritage as a means of preserving biodiversity, the final criteria for selection do not correspond to technical measures of ecological or cultural importance, but rather to gastronomic value. This is assessed based on the expert authority of the gastronome, who – inverting Francastel’s hierarchy of gastronomy and taste – represents a capacity to taste quality that worthy because it is not believed at all to be subjective, instead being acquired through learning and experience. The principle that taste can be acquired is in fact central to the work of Slow Food, which operates ‘taste education’ workshops designed to teach people how to taste good food – a response, in large part, to the observation that unfamiliar traditional foods (like ræstur fiskur) can actually have a disagreeable taste to consumers.

New Nordic Cuisine

New Nordic Cuisine was founded in 2004 by a group of chefs led by Claus Meyer, who expressed a series of values summarized in the ‘New Nordic Food Manifesto’ (Box 1; Nordic Council of Ministers 2004). The New Nordic Cuisine can be seen largely as an identity movement (Byrkjeflot, Pedersen, and Svejenova 2013) rooted in the terroir, or ‘taste of place’, of Nordic countries (Leer 2016). Two of the twelve original signatories are from the Faroe Islands.

Box 1. The New Nordic Food Manifesto

The aims of the New Nordic Kitchen are:

- To express the purity, freshness, simplicity, and ethics we wish to associate to our region.
- To reflect the changes of the seasons in the meal we make.
- To base our cooking on ingredients and produce whose characteristics are particularly in our climates, landscapes, and waters.
- To combine the demand for good taste with modern knowledge of health and well-being.
- To promote Nordic products and the variety of Nordic producers - and to spread the word about their underlying cultures.
- To promote animal welfare and a sound production process in our seas, on our farmland and in the wild.
- To develop potentially new applications of traditional Nordic food products.
- To combine the best in Nordic cookery and culinary traditions with impulses from abroad.
- To combine local self-sufficiency with regional sharing of high-quality products.
- To join forces with consumer representatives, other cooking craftsmen, agriculture, fishing, food, retail and wholesales industries, researchers, teachers, politicians, and authorities on this project for the benefit and advantage of everyone in the Nordic countries.

Tellingly, all ten points in the Manifesto (Box 1) are closely related to the idea of *sustainable gastronomy*, and all embrace the connection to place and culture. Points 2, 3, and 4 directly parallel statements from the UN on food sustainability and SDG2, concerning the use of local, seasonal foods. But we have the addition of point 5, which combines the idea of gastronomes taking a leadership role in the value chain (i.e., the Nordic chef promotes

producers and others who are less visible, upstream in the value chain) with the promotion of cultural diversity. It is significant here that ‘cultures’ are indicated in the plural: this is not a nationalist manifesto, associated with a specific nation-state, but one that highlights the local within a regional culture (‘the Nordic countries’ are also mentioned in point 10). The idea of gastronomic leadership is also present in points 7-10, where the chef is seen to innovate by creating new recipes, combining traditional and new ingredients and methods, while also building networks and partnerships. The New Nordic Cuisine is thus simultaneously local and global: this is expressed explicitly in points 8 and 9, although these are potentially in tension of points 1-3 (being locally grounded, adaptive, and self-sufficient) against point 5 (international promotion).

Also of interest is the supplementary ‘Nordic Children’s Kitchen Manifesto’ (2013), which asserts that “*Every Nordic child has the right to learn how to cook good healthy food*”. This document expresses the idea of children’s rights to knowledge of their cultural traditions; children’s agency (including the “right to their own tastes” as well as the opportunity to be involved in meal preparation); and the right to a fair, healthy, positive, and varied environment. This text cleverly frames the basic idea of *sustainability* – development that does not compromise the opportunities of future generations – as a core set of rights that are experienced in the present moment. The strategy echoes the rights-based approach of chef Alain Ducasse, co-author of the humanist gastronomy manifesto and the book *Manger est un acte citoyen [Eating is an act of citizenship]* (Ducasse and Regouby 2016), who has stated that cooking is a ‘political act’.

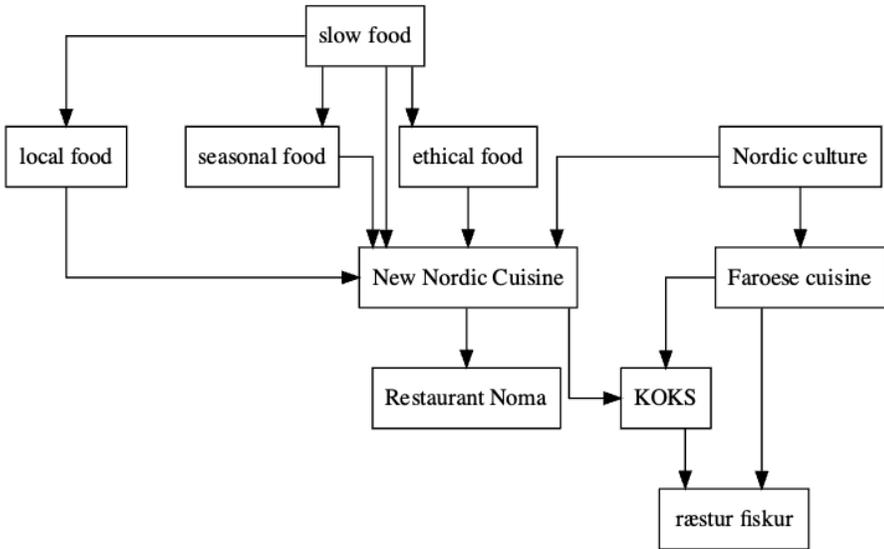


Figure 19. KOKS restaurant and the New Nordic Cuisine. *Ræstur fiskur* is directly associated with the New Nordic Cuisine by way of the menu at KOKS. The New Nordic Cuisine positions itself as part of three broader categories that are also part of slow food, namely local food, seasonal food, and ethical food, with the addition of Nordic culture.

Ræstur fiskur is directly associated with the New Nordic Cuisine by way of the menu at KOKS Restaurant. Described by the *New Yorker* as “the world’s most remote foodie destination” (Mead 2018), KOKS is located in an off-the-road 18th-century farmhouse near Tórshavn, Faroe Islands. Headed by Chef Poul Andrias Ziska, the double Michelin-starred restaurant offers a seventeen-course tasting menu featuring avant-garde preparations of local ingredients. The restaurant has moved on several occasions, including pop-up venues in Copenhagen and Hong Kong; for the 2021 and 2022 seasons KOKS will be relocating to Ilimanaq Lodge in Greenland, pending construction of an enlarged facility in the Faroe Islands, while it assumes operation of two restaurants in Tórshavn in spring 2022 (Johannesen 2021; KOKS 2022b; World of Greenland 2022).

Throughout its promotional texts and menu, KOKS positions itself as an

adherent to the New Nordic Cuisine, a culinary movement that promotes the use of in-season ingredients from the local landscape as part of new menus or reimaged traditional foods (Leer 2016). In its marketing, KOKS declares that its creative force is chef Ziska himself, who “*masters the artistry of distilling taste and smell from the Faroese landscape*” using traditional food preservation methods of drying, fermenting, salting, and smoking (KOKS 2022a). KOKS focuses heavily on local ingredients, claiming that these provide exceptional quality and, due to their slow ripening in the cool climate, the gradual development of an extremely rich taste. The chefs are described as understanding fermented fish and meat (*raest*), “*how the flavour is best developed and how to incorporate it in new dishes.*” A promotional video entitled ‘The Art of Raest’ (Heygum 2017; fig. 19) features an older line fisherman reeling in fish off the coast of the Faroe Islands, as a superimposed voiceover describes the process of fermenting and drying the fish. The commentary highlights the ways in which the process is directed by local geographic and weather conditions, in implicit contrast to industrial foods. The fisherman describes the process of creating *ræstur fiskur*, explicitly indexing the Faroese climate and weather:

You clean it and hang it up to dry for 6 to 8 weeks ... or so. It depends on the weather, the wind, you know – not too warm, must be cool – otherwise the files get to it, if it's too warm ... You can't hang it up in summertime, too warm, it'll be beset with files. And it mustn't be rained on, must stay dry while hanging.

In the extreme, KOKS can be seen as a ‘dogmatic’ adherent to the New Nordic Cuisine, which insists on procuring exclusively products from the Nordic terroir, and which aims to de-centre the French and Mediterranean locus of ‘good taste’ in the cuisine of the Global North (Leer 2016). More broadly, however, the New Nordic Cuisine establishes points of connection to several semantic categories including *Slow Food* (Figure 19). Whereas all local food is presented as contributing to *Slow Food*’s objectives, the New Nordic Cuisine makes an inverse claim: all food that is part of the New Nordic Cuisine is

local, even though not all local food is New Nordic. Similarly, while the argument as stated is that local food, ethical food, Nordic culture, etc., are all constituents of the New Nordic Cuisine, functionally the Manifesto can be read in the inverse – as an association of Nordic gastronomy with existing, broader semantic categories with established value in the gastronomic space. Thus the Manifesto makes a series of distinct claims associating New Nordic restaurants, chefs, menus, the Manifesto itself, and various other practices associated with label *New Nordic Cuisine*, with broader semantic categories such as *local food*, *slow food*, *seasonal food*, and the like.

As discussed with the concept of terroir, claims to membership in a category such as the New Nordic Cuisine amount to assertions of equivalency to siblings within that category; by announcing association with the New Nordic Cuisine, KOKS restaurant is thus placed on a level with establishments such as Restaurant Noma, the leading culinary establishment in that tradition. The New Nordic Cuisine, in turn, asserts the value of the various categories to which it is claimed to belong – *local food*, *Slow Food*, *seasonal food*, *ethical food*, and *Nordic culture* – while also proposing a semantic relationship between those parent categories. Whereas the first of those categories are already interconnected through the Slow Food movement, the New Nordic Cuisine introduces an additional connection to Nordic culture, which achieves validation through its association with sustainability values of global interest.

Gastronomy and the Michelin Green Star

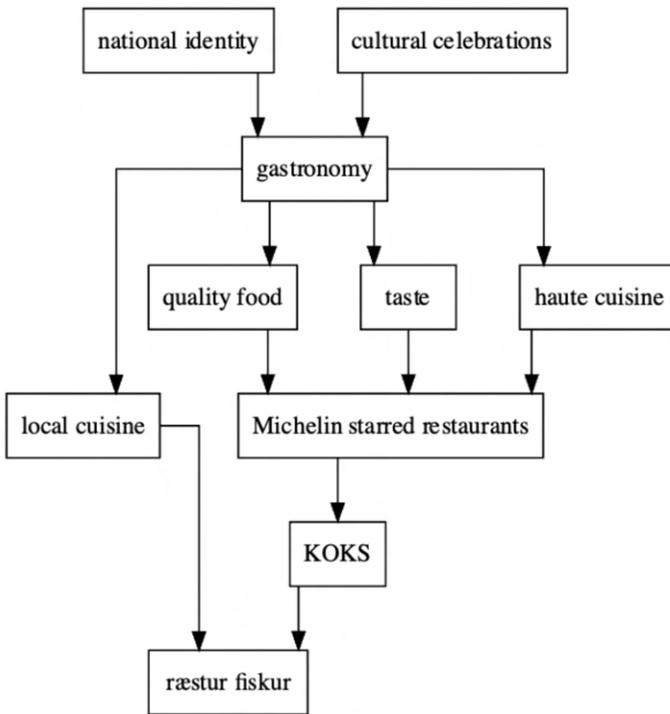


Figure 21. *Ræstur fiskur* and gastronomy. KOKS Restaurant has been awarded two Michelin Stars, associating it with a set of establishments with membership in higher-order categories representing quality food, taste, and haute cuisine, which along with local cuisine constitute subcategories of the semantic category gastronomy, as presented at the beginning of this essay. Gastronomy, in turn, is part of national identity, cultural celebrations, and other broad cultural categories.

The term *gastronomy*, as described at the beginning of this essay, originally refers to the ‘rules of good taste’. Nonetheless, several additional semantic categories have been associated with gastronomy, including local cuisine (e.g., the *cartes gastronomiques*), quality food, and haute cuisine. While *ræstur fiskur* links to Faroese gastronomy as an element of the local cuisine, it also takes on gastronomic value through association with KOKS restaurant, whose Michelin stars identify the restaurant’s menu as representing both quality and good taste, while also announcing membership in the category of refined,

expensive establishments describable as haute cuisine. Gastronomy, in turn, has been associated through initiatives such as the *gastronomic meal of the French* (UNESCO 2010) to national identity and cultural celebrations.

KOKS illustrates a clear philosophy of *sustainable gastronomy* as an area in which restaurants (and chefs) are essentially the vanguard: people who are creative, mix tradition with innovation, are leaders in sustainability, recognize that eating food is an experience, and promote awareness of local and customary ingredients, practices, and flavours while building on them in new ways. They create new recipes and new food experiences, as well as new food-sourcing practices, that set an example for others to follow. This approach is further reinforced through the awarding to KOKS of the Michelin Green Star.

In its materials on Sustainable Gastronomy Day, the Michelin Guide reiterates the four action points for sustainability: Support local producers, Eat seasonally, Keep culinary traditions alive, and Avoid food waste (Michelin Guide 2021c). The ‘Michelin Green Star’, introduced on Sustainable Gastronomy Day 2021, formally recommends restaurants that support sustainable gastronomy. Green starred restaurants must reduce waste (including in their supply chains), and source ingredients locally:

Many work directly with growers, farmers and fishermen; forage in hedgerows and woodlands; grow plants and rear animals; and use regenerative methods such as no-dig vegetable gardens and successional cover crop growing.

(Michelin Guide 2021b)

As of 2022, there are 291 Green Star restaurants worldwide. Green starred restaurants appear to take a leadership role in sustainability, reflecting again the role of the *gastronome* as part of a cultural and political vanguard – such as Inis Meáin Restaurant & Suites in Ireland, which produces their own vegetables but has also partnered with a local group to set up beehives using an endangered bee variety (Michelin Guide 2021a). Connecting Sustainable

Gastronomy Day semi-officially to this initiative, the UN covered the Green Star initiative on its European blog (United Nations 2021). The blog post profiles chef Florent Pietravalle, who advocates building an evolving menu around what is available from within a 150 km radius, what he calls his ‘playground’. Pietravalle also grows mushrooms in the cellar and herbs in a rooftop garden. He advises home cooks to look for locally-sourced products that are in-season; this reduces the environmental impact of shipping and packaging. The UN post concludes that Green Starred restaurateurs are “*examples for their peers and the rest of society*”, as they “*show how sustainable practices are within everyone’s reach, starting with the kitchen.*”

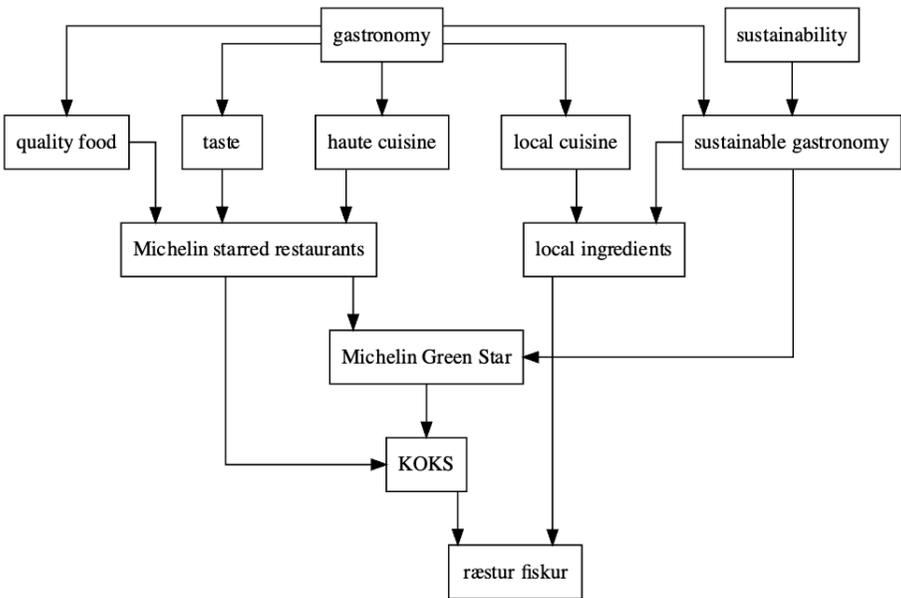


Figure 22. Some semantic categories associated with the Michelin Green Star. This diagram extends Figure 21 to include the Michelin Green Star, local ingredients, and sustainable gastronomy as part of the existing semantic framework associated with gastronomy and the Michelin Guide.

The Michelin Green Star obviously connects to the qualities recognized by

the Michelin Guide – encompassed by categories such as *gastronomy* and *haute cuisine* – while acknowledging the ‘sustainability’ of specific restaurants. The Green Star thus provides a direct point of connection between gastronomy and sustainability, even though the term *sustainable gastronomy* is used infrequently in the Michelin Guide itself. As Figure 21 illustrates, the Green Star brings *ræstur fiskur* into a semantic cluster that encompasses quality, taste, haute cuisine, and local cuisine, as part of the *sustainable gastronomy* relationship.

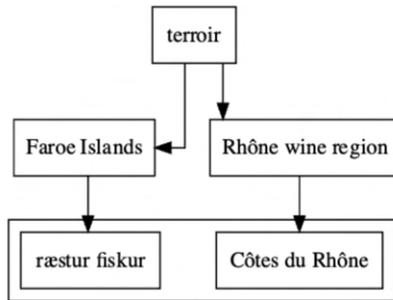


Figure 23. Summary of the key semantic categories associated with sustainable gastronomy, as discussed in this essay.

Overall, we see that the concept of *sustainable gastronomy* is constructed through the association of elements with overlapping and mutually-reinforcing semantic categories, such as the *Michelin Green Star*, the *Ark of Taste*, or *Slow Food*, while itself being constructed as the overlap between two parent categories – *gastronomy* and *sustainability* (Figure 23).

Conclusion

This essay has explored the concept of *sustainable gastronomy* as it applies to dried and fermented fish, focusing on the example of *ræstur fiskur*, a dried and fermented fish product from the Faroe Islands that has been incorporated into discourse on gastronomy, slow food, local cuisine, and

sustainability. The mapping approach I have taken here provides a means to visualize potential strategies for generating associative meaning across related semantic categories.

A gastronomic approach to sustainability, which embraces culture and creativity, contrasts to the position taken by some scientifically-minded sustainability theorists, who have argued for example that the term ‘sustainability’ should be used more precisely to describe issues that directly endanger human survival, to the exclusion of ‘less critical’ elements such as values, beliefs, and aesthetic preferences (Marshall and Toffel 2005). Such a position claims that terms like ‘sustainability’, to the extent that they are used in scientific discourse, should describe measurable, precisely defined phenomena; it also assumes that semantic openness dilutes meaning. To the contrary, as I have suggested in this essay, valid forms of meaning can in fact be established through intentionality in specific contexts – the matter of *“how we go about doing and performing sustainability”* (Ramsey 2015). Semantic openness become politically useful when it creates opportunities for us not only to describe value in the world, but also to enact value as a means of influencing others’ understanding of the world as conveyed through language.

I opened this essay with a reflection on the origins of gastronomy as a codification of ‘rules of taste’, which are superficially a formalization of high culture but more fundamentally manifest processes of negotiating taste-as-value in relation to place and culture. Regional cuisines (gastronomic guides and maps), appellation d’origine contrôlée (terroir), and slow food (sustainable gastronomy) all emerge from the same project of celebrating the value of the local, with reference to broader semantic categories that represent universal value. Being local to the Faroe Islands does not make *ræstur fiskur* inherently valuable, but declaring that *ræstur fiskur* belongs to the category of ‘sustainable gastronomy’ – through inclusion in the menu at KOKS Restaurant and in the Slow Food Foundation’s Ark of Taste – asserts its value on a global scale. The sustainable gastronomic product is at once deeply local and embedded in the everyday life of a particular community, and part of a global category of cultural expressions that are semantically assembled in support of a collective commitment to living sustainably through local

food and culture.

Throughout this volume, our contributors argue that *dried fish matters* in various ways. How can dried fish fit within the movements connected with sustainable gastronomy, which celebrate the value of food as culture, as commodity, as social object, and as point of interaction with our natural environment? Initiatives such as Sustainable Gastronomy Day suggest openings for chefs, home cooks, dried fish processors, merchants, and activists to celebrate the diverse values of dried fish in ways that acknowledge the vital importance of food to culture and sustainable development. Gastronomy is also claimed for other purposes, in ways that may maintain hierarchies of distinction while challenging prior associations with class-based forms of capital. This becomes evident in contemporary discourse on *sustainable gastronomy*, which realigns gastronomy with local, traditional foods and eating practices that are elevated from their everyday contexts through expression in restaurants, festivals, formal celebrations, and the like. As we look for new ways of making dried fish matter in more settings and to more people, the examples I have discussed in this essay may provide valuable inspiration and insights.

References

Archestratos of Gela. 2000. *Archestratos of Gela: Greek Culture and Cuisine in the Fourth Century BCE Text, Translation, and Commentary*. Edited by S. Douglas Olson and Alexander Sens. 1st edition. Oxford; New York: Oxford University Press.

Austin, J.L. 1962. *How to Do Things with Words*. Oxford University Press.

Belton, Ben, Derek Johnson, Eric Thrift, Jonah Olsen, Mostafa Hossain, and Shakuntala Thilsted. 2022. Dried Fish at the Intersection of Food Science, Economy, and Culture: A Global survey. *Fish and Fisheries*. <https://doi.org/10.1111/faf.12664>.

Berchoux, Joseph. 1801. *La gastronomie, poëme didactique en IV chants*. Paris: Giguët et Michaud.

Bourdieu, Pierre. 1984. *Distinction: A Social Critique of the Judgement of Taste*. Harvard University Press.

Butler, Judith. 2002. *Gender Trouble*. routledge.

Byrkjeflot, Haldor, Jesper Strandgaard Pedersen, and Silviya Svejnova. 2013. From Label to Practice: The Process of Creating New Nordic Cuisine. *Journal of Culinary Science & Technology* 11 (1): 36–55. <https://doi.org/10.1080/15428052.2013.754296>.

Cadet de Gassicourt, Charles-Louis (1769-1821) Auteur du texte. 1809. *Cours Gastronomique, Ou Les Diners de Manant-Ville ,Ouvrage Anecdotique, Philosophique et Littéraire; Seconde Édition Dédiée à La Société Epicurienne Du Caveau Moderne, Séante Au Rocher de Cancalle; Par Feu M. C***, Ancien Avocat Au Parlement de Paris*. <https://gallica.bnf.fr/ark:/12148/bpt6k1511334s>.

Côtes du Rhône. 2021. Terroir. October 8, 2021. <https://www.cotesdurhone.com/en/terroir-4/>.

Ducasse, Alain, and Christian Regouby. 2016. *Manger est un acte citoyen*. Paris: Liensliber.

Escobar, Arturo. 2011. Sustainability: Design for the Pluriverse. *Development* 54 (2): 137–40. <https://doi.org/10.1057/dev.2011.28>.

Goddard, Cliff. 2017. Furniture, Vegetables, Weapons: Functional Collective Superordinates in the English Lexicon. In *The Semantics of Nouns*. Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780198736721.003.0010>.

Hermansen, Mark Emil Tholstrup. 2012. Creating Terroir. *Anthropology of food*, no. S7 (December). <https://doi.org/10.4000/aof.7249>.

Heygum, Heidrik a. 2017. *KOKS - The Art of Raest*. KOKS Restaurant. <https://vimeo.com/205040609>.

Hickel, Jason. 2020. *Less Is More: How Degrowth Will Save the World*. Random House.

Johannesen, Uni Holm. 2021. Restaurant KOKS is leaving the Faroes. *Kringvarp Føroya*, December 30, 2021. <https://kvf.fo/greinar/2021/12/30/restaurant-koks-leaves-faroes>.

KOKS. 2022a. ABOUT – KOKS. 2022. <https://koks.fo/about/>.

KOKS. 2022b. KOKS – Restaurant. 2022. <https://koks.fo/>.

Leer, Jonatan. 2016. The Rise and Fall of the New Nordic Cuisine. *Journal of Aesthetics & Culture* 8 (1): 33494. <https://doi.org/10.3402/jac.v8.33494>.

Lotti, Ariane. 2010. The Commoditization of Products and Taste: Slow Food and the Conservation of Agrobiodiversity. *Agriculture and Human Values* 27 (1): 71–83. <http://dx.doi.org/10.1007/s10460-009-9213-x>.

Marshall, Julian D., and Michael W. Toffel. 2005. Framing the Elusive Concept of Sustainability: A Sustainability Hierarchy. *Environmental Science & Technology* 39 (3): 673–82. <https://doi.org/10.1021/es040394k>.

Mead, Rebecca. 2018. Koks, the World's Most Remote Foodie Destination. *The New Yorker*, June 11, 2018. <https://www.newyorker.com/magazine/2018/06/18/koks-the-worlds-most-remote-foodie-destination>.

Meadows, Donella, Jorgen Randers, and Dennis Meadows. 1972. *Limits to*

Growth: The 30-Year Update. Club of Rome.

Michelin Guide. 2021a. Inis Meáin Restaurant & Suites – Inishmaan - a MICHELIN Guide Restaurant. MICHELIN Guide Republic of Ireland. 2021. <https://guide.michelin.com/en/galway/inishmaan/restaurant/inis-meain-restaurant-suites>.

Michelin Guide. 2021b. What Is a MICHELIN Green Star? MICHELIN Guide. 2021. <https://guide.michelin.com/en/article/features/what-is-a-michelin-green-star>.

Michelin Guide. 2021c. Sustainable Gastronomy Day – 18th June. MICHELIN Guide. June 17, 2021. <https://guide.michelin.com/en/article/features/sustainable-gastronomy-day--18th-june>.

Mullan, Kerry, Bert Peeters, and Lauren Sadow, eds. 2020. *Studies in Ethnopragmatics, Cultural Semantics, and Intercultural Communication*. Springer. <https://link-springer-com.uml.idm.oclc.org/book/10.1007/978-981-32-9979-5>.

Nordic Council of Ministers. 2004. The New Nordic Food Manifesto. Nordic Co-Operation. 2004. <https://www.norden.org/en/information/new-nordic-food-manifesto>.

Nudell, Josh. 2020. Archestratus' Gastronomy. *Noodlings* (blog). February 18, 2020. <https://joshuapnudell.com/2020/02/17/archestratus-gastronomy/>.

Ory, Pascal. 1999. *Discours gastronomique francais des origines a nos jours*. <https://www.gallimardmontreal.com/catalogue/livre/discours-gastronomique-francais-des-origines-a-nos-jours-ory-pascal-9782070731459>.

Ory, Pascal. 2001. Gastronomy. In *Rethinking France = Les Lieux de Mémoire*, edited by Pierre Nora. Chicago: University of Chicago Press.

Ory, Pascal, Pascal Taranto, and Sylviane Coyault. 2019. Le Grand débat gastronomique. *Elfe XX-XXI. Études de la littérature française des XXe et XXIe siècles*, no. 7 (April). <https://journals.openedition.org/elfe/340?lang=en>.

Ozaeta, Nana. 2018. Sustainable Gastronomy Will Soon Be The New Way To Cook And Eat. *Metro.Style* (blog). 2018. <https://metro.style/food/features/sustainable-gastronomy-will-soon-be-the-new-way-to/10273>.

Private Collection of PJ Mode. 2015. Carte Gastronomique de La France. Cornell University Library. <https://digital.library.cornell.edu/catalog/ss:3293759>.

Ramsey, Jeffrey L. 2015. On Not Defining Sustainability. *Journal of Agricultural and Environmental Ethics* 28 (6): 1075–87. <https://doi.org/10.1007/s10806-015-9578-3>.

Schumacher, Ernst Friedrich. 2011. *Small Is Beautiful: A Study of Economics as If People Mattered*. Random House.

Second Committee, UN General Assembly. 2016a. A/C.2/71/SR.24: Summary Record of the 24th Meeting.

Second Committee, UN General Assembly. 2016b. A/C.2/71/SR.26: Summary Record of the 26th Meeting.

Slow Food. 2015a. Good, Clean and Fair: The Slow Food Manifesto for Quality. Slow Food International. https://www.slowfood.com/wp-content/uploads/2015/07/Manifesto_Quality_ENG.pdf.

Slow Food. 2015b. Slow Food Terminology - About Us. *Slow Food International* (blog). 2015. <https://www.slowfood.com/about-us/slow-food-terminology/>.

Slow Food Foundation for Biodiversity. 2021. Ark of Taste - What We Do. Slow Food Foundation. May 3, 2021. <https://www.fondazione Slow Food.com/en/what-we-do/the-ark-of-taste/>.

Svanberg, Ingvar. 2015. Ræstur Fiskur: Air-Dried Fermented Fish the Faroese Way. *Journal of Ethnobiology and Ethnomedicine* 11 (1): 76. <https://doi.org/10.1186/s13002-015-0064-9>.

Toronto Star. 2003. Defending Culinary Pleasures Riders of the Slow Ark; The International Slow Food Movement Wants Canadians to Grow, Cook and Eat Good Food Search Begins Here for Endangered Edibles to Invite on to the Ark of Taste, Jennifer Bain Writes: [Ontario Edition] - ProQuest, February 19, 2003. <https://www.proquest.com/docview/438578595/fulltext/66EA32A7F0024E26PQ/1?accountid=14569>.

Trubek, Amy B. 2008. *The Taste of Place*. University of California Press.

UN General Assembly. 2015. Transforming Our World: The 2030 Agenda for Sustainable Development. United Nations. <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N15/291/89/PDF/N1529189.pdf?OpenElement>.

UN General Assembly. 2016. Resolution 71/246: Sustainable Gastronomy Day.

UNESCO. 2010. Evaluation of Nominations for Inscription in 2010 on the Representative List of the Intangible Cultural Heritage of Humanity. 5th Session of the Intergovernmental Committee.

UN General Assembly. 2021. UNESCO Creative Cities Network: Call for Applications. https://en.unesco.org/creative-cities/sites/default/files/2021-uccn_application-guidelines__0.pdf.

United Cities and Local Governments. 2010. Culture: Fourth Pillar of

Sustainable Development. https://www.agenda21culture.net/sites/default/files/files/documents/en/zz_culture4pillarsd_eng.pdf.

United Nations. 2020. Sustainable Gastronomy Day. United Nations Website. United Nations. 2020. <https://www.un.org/en/observances/sustainable-gastronomy-day>.

United Nations. 2021. Michelin Green Star: Nearly 300 Restaurants Committed to Sustainable Gastronomy. United Nations Western Europe. June 18, 2021. <https://unric.org/en/green-star-nearly-300-restaurants-committed-to-sustainable-gastronomy/>.

United Nations [@UN]. 2021. What We Eat & How That Food Is Produced Affects Our Health & the Environment. From Trying Sustainable Recipes to Cutting Your Food Waste , Find out What You Can Do to Be a Food Hero on Friday's #SustainableGastronomyDay: <https://Un.Org/En/Actnow/Food-Hero> <https://T.Co/Ag1myjhjd1>. Tweet. *Twitter*. <https://twitter.com/UN/status/1405737786263670786>.

University of Gastronomic Sciences at Pollenzo. 2021. History & Mission. UNISG - University of Gastronomic Sciences. 2021. <https://www.unisg.it/en/administration/history-mission/>.

WCED. 1987. Our Common Future: Report of the World Commission on Environment and Development. United Nations. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>.

Wilson, Sir Robert. 1861. *Private Diary of Travels, Personal Services, and Public Events: During Mission and Employment with the European Armies in the Campaigns of 1812, 1813, 1814. From the Invasion of Russia to the Capture of Paris*. Vol. 2. J. Murray.

World Bank. 2021. The World Bank Annual Report 2021: From Crisis to

DRIED FISH MATTERS

Green, Resilient, and Inclusive Recovery. Annual Report. Washington, DC: World Bank. <https://doi.org/10.1596/978-1-4648-1778-6>.

World of Greenland. 2022. Køkken. 2022. <https://worldofgreenland.com/en/ilimanaq-lodge/koekken/>.

IV

Co-learning

Introduction: Reflections on Knowledge Co-construction in the DFM Project

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This e-book was conceived, in part, as an effort to support collaborative learning across the Dried Fish Matters project. We invited our project members to contribute exploratory essays that proposed new, preliminary ideas, findings, or observations to encourage interaction among collaborators. In that spirit, the chapters in this section reflect on the research process as a social activity, considering the nature of collaboration and partnership within the processes that have supported the present volume. The concluding, synthesis chapter of this book is included within this section as a commentary on the shared learning that has occurred among the editors of this volume, drawing on the ideas and findings reported in the thirty chapters we received from our colleagues or wrote together.

Two of the chapters in this section describe specific collaborations within the Visualizing Social Economies working group. The first of these is a set of stories we shared with one another over Zoom, amid the COVID-19 pandemic lockdowns, about the tastes and smells of dried fish. These stories purported to communicate the sensoriality of dried fish as food, considering the challenges of representing olfactory and gustatory experiences through language or images. But our shared experiences proved to be much more

than sensorial description: they became an occasion for us, as researchers, to consider how we relate to dried fish in our own lives, and for us to reflect on how our different experiences with dried fish shape our perception of its importance. Mostafa Hossain, for example, describes the smell of Bombay duck as overpowering, to the extent of being potentially offensive to one's neighbours, but points out that the fish is an important marker of taste and identity for the Bangladeshi diaspora. Madu Galappaththi, a Sri Lankan living in Canada, relates how her mother-in-law impressed upon her the importance of feeding her baby dried anchovy powder – a trusted way of meeting an infant's nutritional needs, but also a significant point of connection to Sri Lankan gastronomy. Gayathri Lokuge, also from Sri Lanka, describes her own challenges in accepting the strong taste and smell of the fermented fish she encountered in Cambodia, while noting that she eventually came to acknowledge the distinction of connoisseurs who could distinguish among fish pastes of different quality and origin.

By listening to one another's stories, we discovered that the value of dried fish is at once culturally grounded and deeply personal. As one of our project graduate students, Colleen Cranmer, commented to us in response to this chapter, dried fish comes across as a *deeply sensorial, cultural experience*. Colleen notes a connection to her own research questions of why dried fish livelihoods are pursued, despite the precarity and decline in resources. Is the cultural and social connection to the resource a driving and/or supporting force for this livelihood choice? Colleen observes that both Madu and Nikita's stories also show a connection of traditional gender norms to the use of dried fish.

The second chapter from our Visualization group, by Nireka Weeratunge and Eric Thrift, comments more generally on the experience of working together to create audiovisual documents communicating research findings on dried fish. Oriented by discussions of draft visual documents assembled on PowerPoint slides, the activity provided a context for exploring methodological challenges and opportunities associated with visual research, storytelling, and collaborative video editing within a multidisciplinary group of researchers. The authors note that this experience became an opportunity

to document and explore sensory and cultural experiences that tend to be ignored in more conventional, textual academic outputs. The collaborative activity also provided a setting for more critical discussions of voice and representation. If our goal, as researchers, is to tell stories about dried fish in our social lives, whose stories are we entitled to 'collect' and re-tell? While the initiative to tell our own personal stories was a success, members of this group were also cautious about the risk of privileging their own stories over other, less familiar actors in dried fish value chains who might speak from very different standpoints. In collecting visual evidence to support those stories, we cautioned ourselves about the potential for images out of context to reinforce the 'colonial gaze'. As dimensions of the collaborative research process, this activity suggests the need for reflexivity, deep description, and collective participation in the means of representation.

The chapter by Alexia Pigeault and Fabiana Li raises several important concerns about the nature of communications in an international project, which are especially pertinent given the intended purpose of the Dried Fish Matters project as building an international research partnership. This chapter speaks to research as a social process, highlighting the sociality of communications – in particular 'informal conversations' – as something that can be missing in online work such as Zoom meetings, undertaken during the pandemic. As we shift to a post-COVID world, we might become aware of how we have missed opportunities for communication among researchers as *play* – that is, the kind of talk that is not organized according to a business agenda, with an informational or managerial purpose, but for the purposes of joking and sociality. But this chapter also hints at the unequal power dynamic that can shape co-learning activities. Texts such as our interview guides and consent forms play an important mediating role in our communications in the field; as one of the project members suggests in a quoted passage, these documents set a 'standard' imposed by the Global North, in terms of their language (English), content (Canadian ethics requirements), and form (the long paper document to be read and signed). We might view these scripted communications as disciplinary practices, insofar as they force us to internalize a form of bureaucratic surveillance in otherwise private

communicative settings. Then again, it may be the case that not all of us follow the protocols rigorously; selective reporting and partial compliance could even be read as a form of ‘effective *mis*-communication’ that allows us to circumvent the power – and ‘nonsense’, to use the language of the quoted project member – of the project administration. And we might also think of our conversations in the field as spaces for effective and meaningful communications, where researchers and students are able to share stories in ways that are not immediately visible to anyone else in the project.

Finally, the chapter that I led with my colleagues, on the writing of a global dried fish literature survey, reveals how technological agents can be part of co-learning processes as well. Google Scholar and Zotero, two key tools used in their review, created possibilities for us to explore a much greater volume of texts than a library-based review would have allowed, encompassing grey literature and manuscript sources. They also accommodated quantitative and query-based methods, drawing on a combination of manually applied tags and the indexed full text of each source. These tools thus directly shaped our understanding of what a ‘literature review’ or ‘literature survey’ should become, as a comprehensive census of digital sources instead of a selective study of a narrower body of literature. Zotero, in particular, facilitated co-learning through new forms of collaboration within a team of six authors located in five different cities. Through a shared online library, we were able to share the work of locating, organizing, tagging, and annotating publications. Some of the logistical discussion of the collaborative workflow also occurred within Zotero, in the form of notes and tags left by each author for subsequent reviewers of a given source. To a large degree, the co-learning in this activity involved the discovery of new techniques for incorporating technology into a shared reading and cataloguing workflow.

While the chapters in this section explicitly highlight various forms of co-learning, learning and collaboration are major themes of this volume as a whole. In the final chapter, we take up these threads in discussing how the Dried Fish Matters e-book represents a process by which we have collectively defined or challenged our understandings of ‘value’, in a shared project of making dried fish matter.

28. Tastes and Smells of Dried Fish

Stories by

Gayathri Lokuge, Centre for Poverty Analysis, Sri Lanka

Madu Galappaththi, University of Waterloo, Canada

Mostafa Hossain, Bangladesh Agricultural University, Bangladesh

Nikita Gopal, ICAR-Central Institute of Fisheries Technology, India

Commentary by **Eric Thrift***, University of Winnipeg, Canada

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As David Howes (2019) suggests in his review of the literature on multisensory anthropology, engaging the non-visual senses can potentially disrupt conventional methods for understanding culture, evoking a shift from participant observation to participant sensation: ‘sensing – and making sense – along with others’. In preparing a short film entitled ‘Visualizing Social Economies: Dried Fish Stories from Asia’ (Dried Fish Matters Visualization Group 2021), our research group sought to generate ways of describing and communicating the tastes and smells of dried fish in South and Southeast Asia. Despite calls for ‘sensory anthropology’ (Pink and Howes 2010) or an ‘anthropology of the senses’ (Classen 1997; Goody 2002), there are no widely used methodological frameworks for collaborative engagement of taste and smell as modes of perceiving the world. As our research effort was undertaken in the midst of the COVID-19 pandemic, we were unable to undertake any ‘co-sensing’ activities in the field – that is, reporting on the sensorialities of the kitchens,

markets, and drying yards in which dried and fermented fish are produced, eaten, or sold. But this restriction proved, in a way, fortuitous, as it forced us to direct our attention and reflect on our own experiences with dried fish. How would we describe the tastes and smells of foods we grew up with, and those that we encountered for the first time as adults? How do our feelings toward fish products, including those that we strongly like or dislike, shape our self-identity and our relations with others in our families and communities?

We asked ourselves these questions one day in a Zoom meeting, sharing stories about the taste and smell of dried fish. From this conversation, we report four brief stories below. Two of the contributors to this conversation are from Sri Lanka, but comment on their experiences with fish in Cambodia (Gayathri) and in Canada (Madu); a third contributor is from Bangladesh (Mostafa); and the fourth is from India (Nikita). Following each story, we provide a brief commentary on what it tells us about taste and smell. Their stories remind us that our research is shaped by our own gastronomical experiences; our enthusiasm for certain types of fish – and potentially a repugnance for others – reflects the taste that is acquired from our own cultural milieu.

Gayathri Lokuge (Sri Lanka)

“I’m from the coast in Sri Lanka, so I grew up with fresh fish and dried fish from the sea. But when I went to Cambodia, and started studying dried fish in Cambodia, one of the main differences for me, in terms of taste, and smell, and the process, was getting used to fish from the freshwater sources. So, from the river and the lake, Tonle Sap.

When you started asking questions to these members and people who were making these about the quality of the product, and how do you make it, and how do you relate to this, they actually would open up. If they’re the vendors, they would open the bottle that it’s stored in, and would give it to you to smell. At first, my reaction was like, “Oh, my God!” But then, you know, slowly you start getting used to it. And then I realized that connoisseurs – people who would know this stuff – they can

actually distinguish between the quality. They would be able to point to a quality product with the smell only.”

Gayathri Lokuge is Sri Lankan but went to Cambodia to conduct research on fish processing. She describes both the unfamiliarity of freshwater fish and the overpowering aroma of fermented fish, both of which caught her off guard. But Gayathri goes on to suggest that with familiarity comes acquired taste, and indeed the *gastronomes* of Cambodia rely on olfactory distinction to identify ‘quality’. As Gayathri notes in her field report, Cambodian processors and traders make a distinction of ‘quality’ based on several factors. First, they view aquaculture fish as less clean and hygienic, and oilier, than wild capture fish. Second, these categories map to domestic versus imported fish from Thailand and Vietnam, which are viewed as lower quality and, consequently, sell for less. Certain products such as the smoked big Kes fish, Gayathri notes, were primarily targeted for Cambodians living abroad or tourists. Gayathri’s own observations suggest that in some cases, gastronomic distinction may also rely on the unpalatability of a product to the uninitiated: by virtue of being an acquired taste, strong fermented foods – including fish sauce, ripe cheeses, and the like – can operate as a marker of group identity.

Madu Galappaththi (Sri Lanka / Canada)

“In my case, I grew up in the mountains in Sri Lanka, and then I got married to Colombo, which is coastal. And my daughter was born here [in Canada]. So when I was getting advice from my mom and my mother-in-law, they told me that anchovies are very important to introduce to a baby, when we introduce them to solid food, the pureed form. And my Mom asked me to just add an anchovy to the rice, and the lentils, and [all] that I would cook for her. I didn’t cook her that, because I went by foods and other stuff that I can find here. But then, from my mother-in-law’s side I got this package, and there were little bottles filled with ground anchovies, like dried ground anchovies. So it was a powder, and she made sure that I added a little bit, at least once a week, to make sure that she gets the calcium. So that’s how early that taste is introduced to babies.”

Madu’s story reveals that taste for dried fish is taught from a very young age,

indeed from the moment a baby is able to consume solid foods. The insistence on dried anchovies in this case is presented as a nutritional argument – a desire to ensure that Madu’s baby is fed enough calcium. But clearly cultural imperatives are at work as well, as other forms of nutritionally complete food are much more readily available to, and widely used by, Canadian mothers. We might read into this insistence on anchovies a firm belief in the efficacy of traditional foods, in contrast to the less familiar, globalized and largely industrialized food products available in Canadian grocery stores, which may be perceived with a justifiable hint of suspicion. The practice of feeding a baby dried anchovy powder is perhaps not essential to the child’s own physical survival, but it is an act of cultural survival – an assertion of identity through taste – in the face of geographic dispersal and industrialization. The seeming obstinacy of Madu’s mother-in-law, taking action to ensure compliance with her advice to feed the baby dried fish, represents an assertion of gastronomic rules that encode a Sri Lankan ‘taste for quality’ as indexed to dried fish.

Mostafa Hossain (Bangladesh)

“In Bangladesh, Bombay duck – both the fresh one and the dried one – are the most in-demand and cherished. People just love dried Bombay duck. Also, the fresh Bombay duck, normally people fry it, because the fish is very, very aqueous. Sometimes seven or eight kilograms of fish are need to produce one kilogram of dried fish. Basically it’s water, just water. People still like the taste of fresh, but mostly the dried Bombay duck is the number one product, and everyone in Bangladesh, and then also in the overseas countries where the Bangladeshi diaspora live, they are just very fond and mad about the Bombay duck taste.

When I talked about Bombay duck, maybe two or three neighbouring households know that someone is cooking Bombay duck. But if it comes to the fermented product, the whole village knows that something is going on. It is too intense, too pungent, too stinky. So if you don’t eat it, just don’t go near it!”

Mostafa’s comments, like Madu’s, expose how taste preferences connect to complex understandings of quality. Bombay duck is revered by Bangladeshis for its flavour, but it is also less dense than other species, as the fresh fish is

“just water”; only through drying does the fish become a high-quality food, with the additional drying effort adding to its economic and cultural value. Yet Bombay duck is also smelly, and fermented fish even more so; Mostafa’s admonition to stay away from the “too intense” fish, unless you are preparing to eat it, once again evokes the tension between those who are included and those who are excluded in the consumption of pungent foods.

Nikita Gopal (Kerala, India)

“When I was growing up, we never cooked dried fish at home. So it was only after I got married and went to my husband’s place that I really got into eating dried fish, because my mother-in-law likes to eat dried mackerel curry at lot. So that used to get prepared in the house, and that’s how I developed the taste for dried fish. And then slowly, when I shifted to Cochin and dried fish is available here, I realized that there are several dishes that can be made out of dried fish, that became regular in my household too. So I think taste can be acquired as well, just when Mostafa was telling about how two people got married and one ate fresh and one only had a taste for dried fish, what would they do? I think tastes are acquired as we go along. I think tastes are acquired.”

This story, which describes Nikita’s encounter with different tastes as she married into a family from a different part of the country, provides a statement on how taste for unfamiliar foods can be acquired. In her own case, Nikita went from never eating dried fish to actively cooking dried fish meals in her own household, and even learning new recipes from her adoptive hometown. In her reply to a joking comment from an earlier conversation, which reflected on the confusion that would occur if someone from a freshwater fish-eating family married someone from a marine fish-eating family, Nikita suggests that gastronomic differences can in fact be resolved pragmatically, given her view that taste is acquired rather than being fixed. Taste in Nikita’s case is rooted in kinship, rather than markers of individual or cultural identity: her initial food experiences correspond, in her own words, to what she ate ‘at home’ growing up; but she began to eat dried fish by virtue of her relationship with her mother-in-law, whose taste for dried mackerel curry dictated the

cooking in her extended household. As Nikita went on to create her own household, her cooking practices evolved to reproduce those of her in-laws and of the local community through her own household.

Methodological considerations

The four brief stories shared here convey different relationships with dried and fermented fish, but taken together they suggest several important methodological concerns for our study of dried fish as a cultural category. First, it is clear that there is value in taking a reflexive approach to taste. As researchers, we should take the opportunity to interrogate our own distinctions – what is good or bad, familiar or unfamiliar – as a method to build understanding of taste socialization. As we see with Gayathri’s experiences, these distinctions may only become apparent through defamiliarization, to follow the strategy recommended by Marcus and Fischer (1986). Crucially, the method suggested in this case is not actually to critique unfamiliar food, but instead to critique one’s own taste by positioning the unfamiliar (or unpleasant) as ‘normal’.

Second, if we begin our investigation of the economies of food from the premise that taste is learned, we situate ourselves in a position to explore how taste operates as a normative marker of group identity – kinship, religion, social class, ethnicity, and the like. We can begin to observe how taste intersects with socio-cultural collisions and hybridities, as through marriage or migration.

Finally, we must not lose sight of the fact that taste is deeply sensorial. On the one hand, the sensoriality of food encourages us to perceive taste, literally, in visceral terms – through our bodies, as something that is deeply part of our physical beings. We do not simply touch food with our lips and tongues; we consume it. The food becomes part of our bodies, and our bodily reaction – satedness or indigestive discomfort, pleasure or disgust, for instance – seems beyond the control of the rational mind. Taste in food, and in particular the distinctions between what is agreeable or disagreeable, thus presents itself to us as natural and innate; this is how, as Bourdieu (1987) argued, taste naturalizes social difference. We see from our own stories, of course,

28. TASTES AND SMELLS OF DRIED FISH

that taste can be taught and acquired. We also see that taste is something extraordinarily powerful. Taste and smell motivate us to celebrate foods that we love – and, from a sensorial research perspective, they can indeed help us to ‘make sense’ of dried fish.



Figure 1. Packaged dried sprats in Canada. The label reads: “Supreme / QUALITY YOU CAN TRUST / Ready to cook / ISO 22000-2005 & HACCP Certified Company / Net Weight: 200 g / Dried Sprats / Export Quality / Contents in this pack is equivalent to number of sprats in 400 gm of unprocessed Dried Sprats”.

Submitted by Madu Galappaththi for inclusion in the ‘Visualizing Social Economies’ video presentation.

DRIED FISH MATTERS



Figure 2. Fish powder in Canada. Bottle of anchovy powder on a plate with a plastic fork/spoon, mixed with baby food by a Sri Lankan family living in Canada. Submitted by Madu Galappaththi for inclusion in the 'Visualizing Social Economies' video presentation.



Figure 3. Bombay Duck dried for sale. Bombay Duck Dried for sale at Bharadkhol Fish market, Maharashtra. Wikimedia Commons / User Pradeep717 / CC BY-SA

References

Bourdieu, Pierre. 1987. *Distinction: A Social Critique of the Judgement of Taste*. Harvard University Press.

Classen, Constance. 1997. Foundations for an Anthropology of the Senses. *International Social Science Journal* 49 (153): 401–12. <https://doi.org/10.1111/j.1468-2451.1997.tb00032.x>.

Dried Fish Matters Visualization Group. 2021. *Visualizing Social Economies: Dried Fish Stories from Asia*. <https://www.youtube.com/watch?v=MCNIGcBJkfE>.

Goody, Jack. 2002. The Anthropology of the Senses and Sensations. *La Ricerca Folklorica*, no. 45: 17–28. <https://doi.org/10.2307/1480153>.

Howes, David. 2019. Multisensory Anthropology. *Annual Review of Anthropology* 48 (1): 17–28. <https://doi.org/10.1146/annurev-anthro-102218-011324>.

Pink, Sarah, and David Howes. 2010. The Future of Sensory Anthropology/the Anthropology of the Senses. *Social Anthropology* 18 (3): 331–33. https://doi.org/10.1111/j.1469-8676.2010.00119_1.x.

29. Dried Fish Stories: Reflections on Visualizing Social Economies of Dried Fish in the Time of COVID

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Documentation of research findings with images and videos from study sites across six countries was an intended output of Dried Fish Matters at the scoping stage. However, COVID-19 lockdowns and travel restrictions severely hampered the access of research teams to fieldwork sites. The Visualization Group came into being as an organic evolution of the group process in discussing preliminary findings in DFM's Working Group I on Social Economies of Dried Fish. Group members came together to form a sub-group of WGI because they recognized the challenge of documenting research findings within the context of a pandemic. However, they also saw an opportunity to visually explore dimensions of dried fish that emerged as important in the findings but were not usually revealed adequately through conventional scientific methods, especially sensory experiences and cultural and symbolic aspects.



Figure 1. Fish drying on hanging racks, Bangladesh. Credit: Mostafa Hossain

In the discussion process of what and how to visualize, several objectives were expressed. First, documentation to complement and triangulate research findings remained a significant goal. Second, capturing sensory experiences, such as taste, smell and touch, and understanding the role of dried fish in cultural and symbolic traditions, such as cuisine and ritual, as well as providing a sense of home and place became increasingly important. Third, visualization was also perceived as a way to disseminate research findings in a way that would attract a broader audience beyond the scientific community.

This short essay reflects on the collaborative process of generating stories on dried fish from seven research teams across five countries, by creatively combining limited material from the field with internet and social media resources. These stories were intended to communicate the cultural value and sensory experiences associated with dried fish through multimedia forms of representation. The essay also discusses the technical challenges of producing a video using technologies that were accessible and familiar to the multidisciplinary researchers who made up our team.

The process

Once upon a time there was a group of seven research teams working in partnership within a very large research project called “Dried Fish Matters” in South and Southeast Asia. They had to visualize their preliminary research findings. They were caught in the middle of a pandemic called ‘COVID-19’, with lockdowns and travel restrictions, and had difficulties accessing the field. Many had done literature reviews and some had done interviews in the field prior to or during COVID. But they did not have the time or, especially during pandemic lockdowns, the confidence and security to take photographs of the research sites or create recordings or videos with interview subjects. Rapport-building was challenging with masks and social distancing. One of the outputs of the project was visualization – so how were they going to visualize their findings?

Their research so far had brought up important themes and issues. So, they put their heads together for a brainstorming session outlining each person’s ideas and expectations and generated a storyboard elaborating some of these ideas and themes. This was about how fish changed hands from fishers, processors and traders to consumers along the value chain; the work done by women and men; their hardships, sorrows and joys; the taste and smell of dried fish in their cuisines; unique dried fish products in different cultures; the myriad ways of preparing favourite dishes; the offerings to deities and meanings attached to dried fish in their cultural heritage; the memories of dried fish carried by migrants, sustaining their identities and culinary traditions across the seas.

Then each team set about finding the ‘best story’ they could tell. They made an outline of their story and elaborated it by collecting materials. They put together photos or videos from the field. They searched for images, sounds and music on the internet and communicated with strangers to ask for permission to use this material. Each team went through several versions of their stories, receiving feedback from the others, making them more reflexive of what they were attempting to do. As time went by, the seven teams managed to come up with a set of stories. A core group within the team put it all

together, a technical wizard converted it to video, inviting feedback again before the presentation at the MARE conference in June 2021.

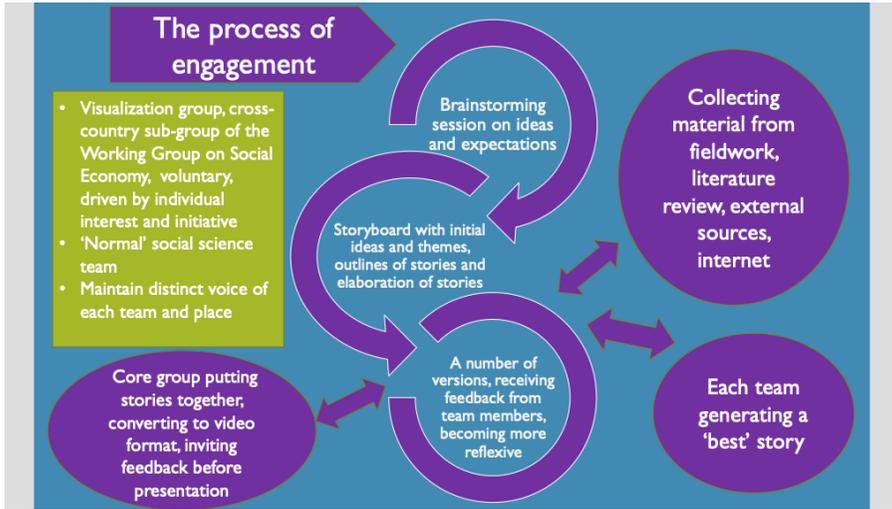


Figure 2. The collaborative video production process

Until the Dried Fish Matters project is over, this will remain a work in progress, in process, of the findings, thoughts and experiences at this stage of the research project. It is conceived not as a finished product, but something that can be built upon into the next phase. It is now available as a YouTube video (<https://youtu.be/MCNIGcBJkFE>) and feedback received from audiences will be part of the process, which is at the core of this method.

The video produced is the work of members of a 'normal' social science research team, not a product of professional documentary film makers or photographers or graphic artists. While putting this together, maintaining the distinct voice of each team and place was a priority. The main intention of the team members was to not confine themselves to academic frameworks and analysis, but much rather tell a story, be creative and have fun.

Storytelling as a method

What we have been doing here with the visualization initiative is interweaving three ancient methods of communication – storytelling, images and sounds – using modern digital technology.

Storytelling is an ancient and universal cultural practice. It is one of the earliest forms of *communication* within and across *communities*. The root word implies that communication, as a process, is linked to communities. Stories convey ideas, experiences and emotions to give us a message, while evoking a sense of time and place. Different cultures emphasize time or place. For example, many European cultures begin a story with “Once upon a time...” whereas Asian cultures like Weeratunge’s in Sri Lanka begin with “Once in a certain land...”. Words in stories have been accompanied by sounds and pictures for many centuries – these make messages more vivid and powerful. Today’s digital technology enables the continuation of this tradition of combining words, sounds and images in more complex ways to tell our stories

A scientific theory has some resemblance to a story. For example, ‘The Big Bang’ is an origin story, a grand narrative of how our planet earth emerged in the vast universe, that we call the Milky Way.

Scientific papers or presentations can also be perceived as telling stories. A good paper or presentation has a thread, not dissimilar to a plot, with an introduction and conclusion. Concepts are ideas that are shared among a scientific community. The argument in a paper or presentation is the theme or its message. The evidence to substantiate the argument constitutes elaborations to support the message. A scientific study is usually done in a specific location and time, so there is a place and time in science too. So what is missing in a scientific story compared to a regular story? Are there characters in a scientific story? Are there emotions and experiences conveyed in this story?

Stories include several elements. These include a plot or story line, constituted by sub-plots, as well as a beginning and an end. In a story there is always a setting or location, that provides a sense of place. Stories need

to include characters with whom readers or listeners can identify. Stories have a theme or message that they want to convey. Finally, a story has a tension, conflict, contradiction or mystery that needs to be solved, resolved or deciphered at the end. A good story moves people, i.e. it is 'moving', dynamic, touching you at the gut level. It creates empathy - the possibility of walking in someone else's shoes. A story builds a connection, a bridge between the storyteller and listener.

Thus, for example, the Thai team relates the story of the process of making, trading and consuming *kapi*, a fermented krill or shrimp paste, centered on an image of a young woman preparing a favourite Thai dish, accompanied by the sound of pounding (Figure 3). The story gives a sense of the colour, texture and taste associated with *kapi* and its place in Thai cuisine, but also refers to some of the ecological and governance challenges associated with its production.



Figure 3. Still image from the segment 'All About Kapi', contributed by the Thailand team

The story told by the Sri Lanka team begins with a favourite dried fish dish,

karavala hodda, linking a consumer and processor, as characters located in different places along the value chain (Figure 4). It uses music, sounds and images to evoke a sense of place and tradition, and refers to the smell of dried fish, which provides a twist to the significant cultural value associated with dried fish. This leads to further elaboration of the sensory experience of smell of dried fish with a short vignette of a discussion by team members, as well as the story of Bombay Duck presented by the Western Indian team.

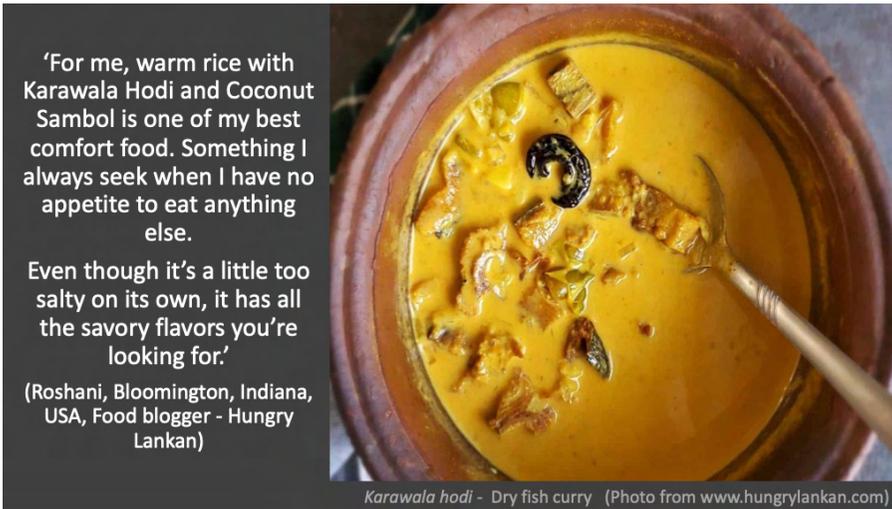


Figure 4. Still image from the segment on *karavala hodda* by the Sri Lanka team

Technical challenges

One of the guiding premises of our visualization group was that our work should in fact be collaborative. Although we considered the option of having individual researchers or teams submit images, video clips, and text to be put together by an editor, the contributing teams expressed a desire to make the process more organic and participatory. We wanted the individual researchers and teams contributing to the audiovisual presentation to remain

in control of what they shared and how it was shown. We sought to achieve this goal by insisting on a workflow in which contributors were able to use design tools that were already familiar and accessible to them.

In a conventionally produced video, a director or videographer might work with contributors to collect and edit images and audiovisual footage, but would make key artistic and narrative decisions on the others' behalf. To counteract this power imbalance, various participatory research and storytelling methodologies have been built around the idea of placing technology in the hands of contributors, including participatory video (Milne et al. 2012), photovoice (Wang 2006), or digital storytelling (Worcester 2012). These approaches may emphasize a hands-off principle for trainers and facilitators, whereby only the participants themselves are allowed to touch cameras or editing tools. The results can be a useful, if sometimes clumsy, compromise between respecting the voice of participants and creating a work that communicates their message in an effective and aesthetically satisfying way.

In our case, instead of providing training in a new video editing technology, we opted to use PowerPoint as a tool that was already familiar to everyone in our group, consisting of researchers with experience teaching and making public presentations. While intended primarily as a tool for generating slides to accompany spoken presentations, PowerPoint provides the option of converting a slide deck into a video, in addition to various related tools allowing users to record optional per-slide narration, insert a background audio track extending over several slides, create animated effects, and embed audiovisual elements. We initiated the process by supplying a template storyboard (Figure 5), containing a base design and placeholders for different contributions.

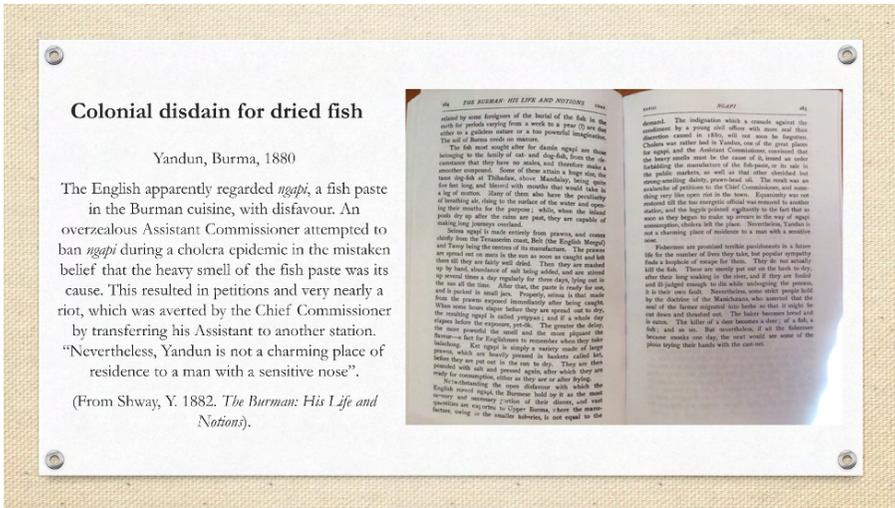


Figure 5. Mock-up slide from the 'Dried Fish Stories' template storyboard, containing a summary text and image from the book *The Burman: His Life and Notions*, published by British colonial administrator Sir James George Scott under the pseudonym 'Shway Yoe' (Scott 1882).

While this process achieved its purpose, from an editorial perspective our reliance of PowerPoint introduced several novel challenges. First, the design structure suggested by PowerPoint – involving combinations of text and image/video blocks on distinct slides – is closer to the format of a museum exhibit than that of a conventional narrative video. Converting a static set of slides into a more fluid video presentation would require creative use of animations and transitions, potentially taking inspiration from documentary techniques for storytelling through still photographs as pioneered by Ken Burns (Tibbetts 1996). Second, although PowerPoint is a familiar medium for academics, scholars are not always skilled visual designers; a researcher's idea of a 'typical' PowerPoint slide might be a wall of text. Given that a video might ultimately be viewed on a range of screens – including low-resolution mobile devices – it was necessary for us to adjust the design of several contributions by enlarging the text and splitting it across several slides. We added transitions between the slides on most segments, including automatic pan-and-zoom

effects for images, to enhance the visual flow of the video (Figure 6).

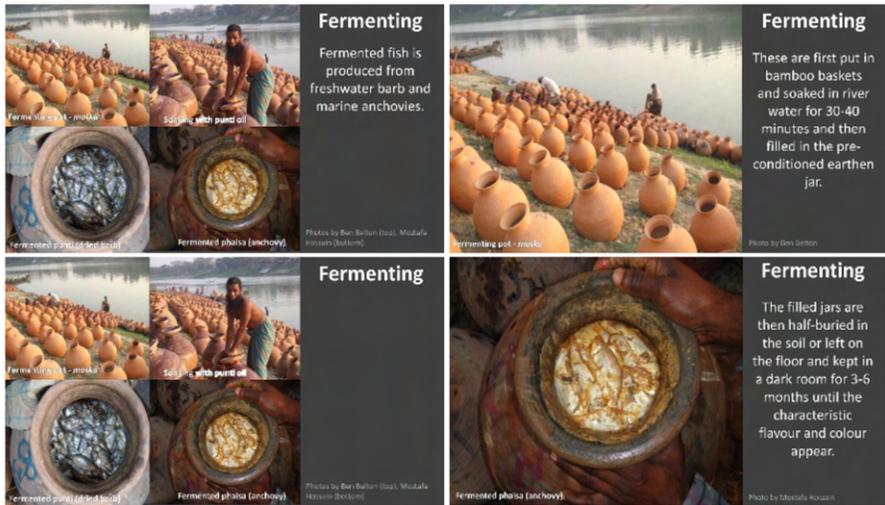


Figure 6. Image sequence on fermented fish from the Bangladesh segment of the “Dried Fish Stories” video. Originally supplied as a single slide, the text was split into three paragraphs and zoom transitions were implemented to highlight a single image next to each text block.

In segments that contained series of still images with audio commentary, we found it very difficult to adjust the timing of slides and desired animation effects in PowerPoint to match the duration of the accompanying audio, and cumbersome to make changes that involved edits to the sequence. In the end, we imported the slide content into the video editor timeline to apply key frame animations, adjust audio levels, and insert a background audio track for titles and other segments with blank audio. Although segment authors were able to make or suggest further changes to the source PowerPoint files after viewing successive renderings of the compilation video, each change required us to re-implement those changes in the video editor. Thus, while we were able to capture the intent of each contributor in integrating their segment to the compilation video, we were unable to work entirely within

PowerPoint as a video editing platform under the control of the authors as originally envisaged.

Methodologically, this experiment confirms to us that co-creation processes may be successful if they build on tools that are already familiar to participants, avoiding the demands of acquiring skills in an unfamiliar medium. Our experience also suggests, however, that the most satisfactory results do not necessarily come from all participants retaining direct control of all stages of the production, by using familiar or accessible tools from start to finish. We found that PowerPoint served as an excellent storyboarding medium, but that its technical limitations became, at the editing stage, significant barriers to creating a product that matched our aesthetic vision. While the translation of images, text, narration, background audio, and animations from PowerPoint to a non-linear video editing system was a cumbersome process, which introduced a significant labour burden for the video editor/technician, this approach allowed us to incorporate expressive opportunities for contributors into our project – and to create a final product that fulfilled contributors' vision without being entirely constrained by their technical skills. Ultimately, our team members wanted something that looked nice, not clumsy and unsophisticated; they wanted to be able to put together a storyboard of their own, but not necessarily deal with all the technicalities of turning the storyboard into a final product.

Representation

In narrating stories related to research findings from the field, representation is a critical issue. Whose story are we, as researchers, re-telling? As social scientists we consider it our responsibility to provide a voice especially for those whom we encounter as 'powerless' in the field. A story is an interpretation of the research findings. It will always remain a partial truth in terms of the 'objectivity' often perceived as a goal in science. A story is best told from the perspective of its important characters. However, when we consider a value chain for example, which characters are the most important? Fishers, fish processors, traders, consumers? Can we always access the most

important characters or the ‘powerless’, as for example, in the context of COVID-19? Thus, what emerges as significant is the reflexivity with which we tell our stories. We need to be especially mindful that researchers are part of the story. We are part of the story because we go into the ‘field’ to collect data for our research projects. However, in the case of dried fish value chains, we are also part of that chain as consumers. Thus, dried fish stories are our stories too, as much as that of fishers, processors and traders. The dried fish stories we produced also included discussions of sensory experiences of the researchers themselves, as two vignettes on the taste and smell of dried fish.

Lessons learned

Working on dried fish stories together as a group within the Dried Fish Matters project made us aware that visualization is a unique method to compare and contrast results across research locations in different countries, as well as to encapsulate research findings in an appealing manner. Visualization helps to document research findings, as much as to explore sensory and cultural experiences that are often neglected using standard written methods of analysis, such as reports, papers and books. Most importantly, visualization helps to convey a compelling story to move people, calling upon them to reimagine the way they look at the world and act upon their insights.

References

Dried Fish Matters. 2021. *Visualizing social economies: Dried fish stories from Asia* (video, 24:02). <https://www.youtube.com/watch?v=MCNIGcBJkfE>.

Milne, E-J, Claudia Mitchell, and Naydene de Lange. 2012. *Handbook of Participatory Video*. AltaMira Press. <http://ebookcentral.proquest.com/lib/u/manitoba/detail.action?docID=1037804>.

Scott, Sir James George. 1882. *The Burman: His Life and Notions*. Macmillan

and Company.

Tibbetts, John C. 1996. "The Incredible Stillness of Being: Motionless Pictures in the Films of Ken Burns." *American Studies* 37 (1): 117–33.

Wang, Caroline C. 2006. "Youth Participation in Photovoice as a Strategy for Community Change." *Journal of Community Practice* 14 (1–2): 147–61. https://doi.org/10.1300/J125v14n01_09.

Worcester, Lara. 2012. "Reframing Digital Storytelling as Co-Creative." *IDS Bulletin* 43 (5): 91–97. <https://doi.org/10.1111/j.1759-5436.2012.00368.x>.

30. Computer-assisted Research and the Construction of a ‘Dried Fish Literature’

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Three years ago, we set out on what appeared, at the time, to be a fairly straightforward task: writing a survey of the published literature on dried fish in South and Southeast Asia. As we struggled to make sense of hundreds of references to dried, fermented, salted, and smoked fish returned by Google Scholar’s opaque algorithms, we found that technology had come to play a governing role in our unexpectedly formidable project. Instead of simply reading and summarizing an established body of scholarship, we were actively working to define a ‘dried fish literature’ through the intermediary of Google Scholar, Zotero, and additional tools of our own design. In this essay, I reflect on how communicative tools and technologies shaped our reading of this literature, structuring our ways of seeing and interacting with ‘dried fish’ as a category of knowledge.

The project

Our project began in 2018 as a relatively modest literature review concerning dried fish in South and Southeast Asia. Over the course of the next three years, this work expanded into the much larger project of building and analyzing a comprehensive, global bibliographic database of publications on dried fish. By the end of this activity we had collected and catalogued over 3000 tagged items pertaining to dried fish, including a core set of 1,130 publications we identified as directly relevant to dried fish and for which we had collected full bibliographic details (Dried Fish Matters 2021). In the process of this work, we also created an online tool for generating graph visualizations from our dataset, and an associated command-line tool developed for querying and updating the bibliographic database (Thrift 2021b; 2022). We presented our methods and analysis of this database in a paper at the MARE Conference in 2019 (Johnson et al. 2019), a training module on literature reviews for an online course on transdisciplinarity in fisheries research (Johnson and Thrift 2020), and a 135-minute webinar (Thrift, Belton, and Johnson 2020). Our overall analysis of the literature database was written up as an 8,000-word article published in the journal *Fish and Fisheries*, accompanied by five appendix documents containing supporting information about the dataset and our analytic methods (Belton et al. 2022). The database has subsequently been used in the preparation of a chapter in an FAO Technical Paper on small fish (Johnson et al. In press), and continues to support and integrate the work of our students and research partners.

Our literature review was originally conceived as the first major research output of the SSHRC-funded partnership grant ‘Dried Fish Matters: Mapping the social economy of dried fish in South and Southeast Asia for enhanced wellbeing and nutrition’. The initial rationale for this review, as set out in our project proposal, was that the existing published research concerning dried fish was sparse. We noted that key members of the research teams had already been ‘major contributors’ to the ‘small body of research in this area’. We envisaged that a student research assistant would be able to assemble a fairly comprehensive set of publications on dried fish through a scholarly

database search, which we could then classify and summarize according to the themes of our own project. This literature review would then guide our own research during our seven-year partnership grant, by helping us to identify knowledge gaps worthy of being filled by the various research partners and teams. Summarizing our intentions in a planning document at the inception of this project, we wrote:

The intent of the paper is to establish a baseline review of knowledge on dried fish globally, but with focus particularly on Asia and Africa, as those are the areas with the largest dependent populations and with the most pressing nutritional needs. The paper will also provide a valuable framework, identifying major gaps in knowledge, for DFM. It will reinforce DFM's *raison d'être*, and provide an empirical basis to position our efforts.³³

In setting the parameters for this review, we sought to combine a search for literature explicitly concerning dried fish with a kind of 'forensic analysis' of the broader fisheries literature, looking for incidental mentions of dried fish. (At this point we still considered the 'dried fish literature' to be a subset of the 'general fisheries literature', though we later came to make the claim that they are substantially distinct.) We acknowledged that our review would be guided by a set of pre-established themes derived from our 'existing knowledge of the dried fish literature', to be adjusted based on our actual findings. This prior knowledge drove our understanding of dried fish as having historically been central to coastal economies and to global food systems, yet under-documented in a published literature that we saw as fragmented and partial. We estimated that the literature on dried fish was dominated by reports on the results of technical analyses of products or processing practice; confirming this hypothesis should, we thought, bring justification to our broader research project.

We began the literature review with an established set of inclusion criteria for processed fish products, corresponding roughly to *dried or fermented but not canned fish*. We came to acknowledge a 'distinctive definition of dried

³³ 'Summary notes of Dried Fish Review paper brainstorming', 2018-03-21, internal document DFM_MEM_Dried-fish-lit-review-notes_2018-03.

fish' that was not entirely 'dry':

During a series of project inception meetings in June 2019, project participants agreed to an expansive definition of dried fish: any processed fish that can be stored without artificial cooling. As such, dried fish includes sun-dried, smoked, salted, and fermented products. We include fish sauce in our definition, but not canned fish. Dried fish can be eaten whole or, more commonly, is integrated into food preparations as a component or condiment to enhance flavor and nutrition.

(Belton et al. 2022)

As suggested by the statement above, recognizing that fermented fish actually had much of the same role as dried fish in the Southeast Asian sites included in our research project, our broader intention was to describe *dried fish* as a material product positioned within social, ecological, and economic fields. In this sense, our study addressed several claims about dried fish that were fundamentally definitional insofar as they constructed *dried fish* as a conceptual category, rather than as a product defined exclusively in material terms:

- Dried fish is produced in value chains with four levels of actors: producers (i.e., fishers or aquaculturalists), processors, wholesalers and traders, and retailers.
- Dried fish is predominantly processed by women.
- Dried fish meets the food security needs of vulnerable people.
- Dried fish is highly nutritious.
- Dried fish has important cultural value.
- Dried fish often has low food quality and safety characteristics, from the perspective of a large proportion of current 'technical' research.

We expected that our literature review would refine these claims, for example by identifying specific evidence of nutritional or cultural value, or by providing quantitative support to claims about the role of women or the dominant trends in technical research. While it is unsurprising that our

study achieved this broad objective, more interestingly our methods and tools influenced the specific findings we were able to advance – including the selection of evidence for each of these claims, and the ways we were able to present that evidence.

Google Scholar: Queries and keywords

We opted to use Google Scholar to locate publications for the literature review sample, due to the search engine's strong coverage of grey literature – including technical reports from the FAO and other intergovernmental organizations. We knew the grey literature to be the only source of published information on dried fish for some of the locations included in our project. Studies comparing Google Scholar to 'controlled' academic publication indexes, such as Web of Science and Scopus, have confirmed that Google Scholar returns a significantly larger number of citations, since approximately half its sources are from non-journal sources (including conference proceedings) and, for some searches, more than one in three are from non-English publications (Martín-Martín et al. 2018). Google Scholar's coverage appears to be stronger for some disciplines than others, providing lower-quality results in some fields but higher citation coverage of the social sciences and humanities than controlled indexes (Halevi, Moed, and Bar-Ilan 2017). The most current comparisons suggest that Google Scholar locates 90 percent of citations found in Scopus and 94 percent of those found in Web of Science; conversely, Scopus and Web of Science respectively only locate 58 percent and 55 percent of results returned by Google Scholar (Martín-Martín et al. 2021). These characteristics made Google Scholar an attractive choice for a literature review intended to focus on fragmented research often located in 'low-ranking' publications.

Jonah Olsen, then an anthropology student at the University of Manitoba, was hired to take on a literature search in May and June of 2018. We established that Jonah would conduct searches combining terms for dried fish either with names of areas of geographic focus within our project, or with keywords related to the themes of our research. For the geographic

regions, we settled on the six countries of our project (keywords “India”, “Sri Lanka”, “Bangladesh”, “Cambodia”, “Myanmar” / “Burma”, and “Thailand”), sub-national administrative units in which our research terms were located (“Andhra Pradesh”, “Gujarat”, etc.), and regional units (“Asia”, “South Asia”, “Southeast Asia”). For the thematic keywords, we chose eleven terms that reflected the major focus areas of our transdisciplinary project: economics (“demand”, “value chains”, “economics”), health (“health”, “food security”, “nutrition”), social science (“gender”, “women”, “wellbeing”, “ethnography”), and technical interventions (“technology”). For dried fish, we opted to include the keywords “dried fish” and its variant “dry fish”, “cured fish”, “smoked fish”, and “fermented fish”, reflecting the working definition advanced in our project proposal of *dried fish* as any aquatic animal product “preserved using simple techniques including sun drying, salting, fermentation, and smoking”.

These search terms produced a total of 110 combinations, each of which was entered into Google Scholar as an individual search query. Using the browser plugin for the Zotero reference manager, we retrieved the metadata and PDF for publications from each consecutive search until we judged that the items being returned were no longer relevant, then reviewed all results to remove false matches for the query. Each search resulted in a median of seven valid results, with a low of one and a high of 43 (Figure 1). In general, we obtained the fewest valid results from thematic keyword searches, and the most valid results for searches with geographic keywords identifying sites of major production (“India”, “Sri Lanka”, “Kerala”, “Cambodia”, “Bangladesh”, “Indonesia”, and “Southeast Asia”). Not all results deemed ‘valid’ necessarily had a direct correlation to the specific search term as used, but were sometimes retained due to their general or incidental importance to dried fish. In some cases, a result item incidentally referenced a country identified in the search term but, in relation to dried fish, directly concerned a different country altogether. Several result items surfaced through more than one search; these items were imported repeatedly for each search then merged within Zotero. At the end of the first search round (May-June 2018), we were left with 811 items. 443 of these items were only incidentally relevant to dried fish, and 367 were written from a ‘technical’ or

food science perspective (104 items overlapped these two categories). This left only 105 items that addressed dried fish from the major themes of interest that we had identified.

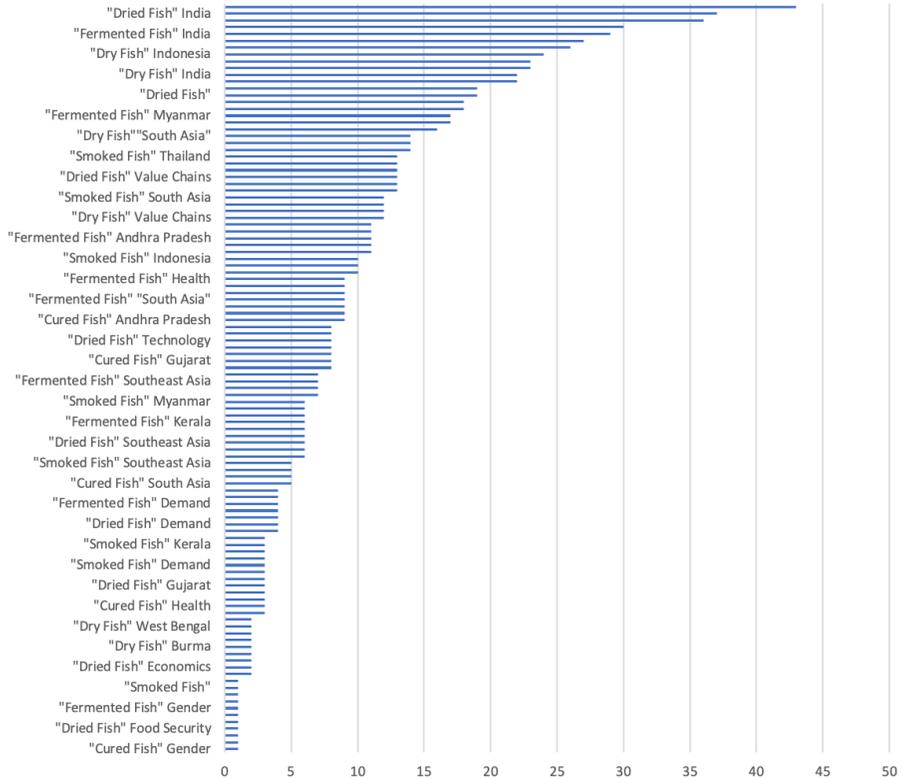


Figure 1. Number of valid results returned by each search query in the first round of Google Scholar searches. Each bar represents a single search query. Labels represent the text of search queries used in Google Scholar; to increase legibility, not all search terms are shown.

Zotero as QDA platform

We chose Zotero to manage our search results, as an open source reference management platform that provides a web browser plugin to facilitate downloading publications and their metadata from scholarly search engines, libraries, and publication websites. Billed as “*a free, easy-to-use tool to help you collect, organize, cite, and share research*” (Corporation for Digital Scholarship 2022), Zotero was originally developed at the Roy Rosenzweig Center for History and New Media at George Mellon University and is now managed by the non-profit Corporation for Digital Scholarship, as part of its goal to provide sustainably managed, open-source infrastructure for digital humanities scholarship. Zotero was initially built as a plugin for the Firefox web browser, but now exists as a standalone desktop application and a web-based service, with an optional subscription model for online data storage. As it was first developed as a citation management tool, Zotero has many features in common with tools such as EndNote, Mendeley, and Refworks – including batch import of references from online databases, integration with word processors, and creation of bibliographies – but distinguishes itself as the only major open-source reference management platform (Ivey and Crum 2018). Although we have seen some publications regarding creative uses of Zotero, for example as an information literacy teaching tool (Winslow, Skripsky, and Kelly 2016), we have not encountered recent discussion in academic sources of how Zotero itself shapes the construction of knowledge.

We were drawn to Zotero’s collaborative functions, which allow teams of researchers to synchronize sets of publications, metadata, notes, and tags using a cross-platform desktop application. Zotero provides users the option to organize items using arbitrary *tags*, which persist as items are moved or copied to different places in the library, and *collections* (working folders), which gather sets of items but are not permanently associated with the items they contain. We were particularly interested in the possibility of using Zotero tags for systematic analysis, by filtering publications according to individual tags or tag combinations. Beyond supporting our literature review as an immediate goal, the Zotero library itself could serve as a valuable

research output – offering a catalogue of references that may be queried, analyzed, and cited by members of the Dried Fish Matters partnership and beyond. Anyone with access to the library and a word processor plugin is able to insert citations to publications concerning dried fish in a document written in Word, Open Document (LibreOffice), or Google Docs formats, and to generate a correctly formatted bibliography, thanks to the word processor plugins that are packaged with Zotero.

Once the search results had been collected in our database, we divided up the library alphabetically and coded each item using a predetermined list of tags. As many of the items were automatically assigned subject tags by the software on import, drawing on the publisher-supplied keywords and subject headings, we used the hash symbol (#) as a prefix to distinguish our analytic codes from any other tags that might be present in the database. In our first round of analysis we first went through the library distinguishing between items that directly and incidentally concerned dried fish, using the tags [#RELEVANCE: Direct] and [#RELEVANCE: Indirect], and assigning one of twelve thematic tags derived from the project's core topics. Items that related to value chains or microeconomics were also assigned a segment tag, and those that concerned the primary production segment (i.e., fishing) were assigned the tag [#FISHERY: Inland] or [#FISHERY: Coastal] (Figure 2). Following this process, we read through the library a second time to review and validate the tagging, wherever possible working with a set of items that another member of the team had tagged in the previous round.

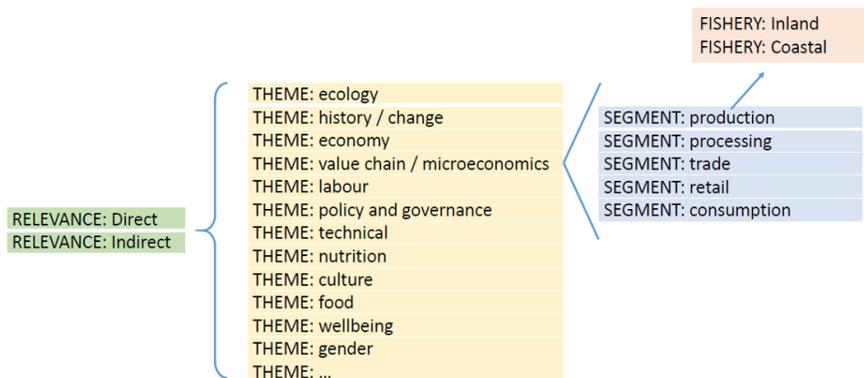


Figure 2. Tagging tree used in our initial quantitative analysis of the dried fish literature (Johnson et al. 2019). The distinction between inland and coastal fisheries proved impractical to make, and was therefore abandoned in our analysis. We also adopted a set of product tags, not represented in the figure.

Our thematic categories were refined as we became more familiar with the literature and saw the need to add, merge, or split tags. This process is consistent with the practices of qualitative data analysis (QDA), as employed using tools such as Atlas.ti or NVivo, with the difference that Zotero tags (codes) are necessarily associated with documents rather than individual segments within a document – such as passages within an interview transcript – as would typically be done in QDA.³⁴ In terms of analytic functions, Zotero provides similar coding options to typical QDA software, including the ability to combine and rename tags, filter by tag or tag combination, and create reports of items that match specific tags or other criteria. Zotero ‘notes’, which can be associated with items or created as standalone documents,

³⁴ The current beta version of the Zotero desktop client includes a built-in PDF reader, which allows users to associate annotations and tags with individual passages in a stored PDF document stored within Zotero. As of this writing, this feature is incomplete: the Zotero client does not provide a mechanism for searching or filtering tags associated with document passages, or for searching annotations across multiple documents; nor does it accommodate the annotation of items within shared libraries.

mirror the ‘memos’ of QDA software. Although there is no function to assign definitions directly to tags in Zotero, standalone notes can be used for that purpose, as they may be associated with the tags they describe.³⁵ Similar to the reporting features of QDA software, Zotero’s ‘saved search’ function allowed us to create dynamically-updated folders listing specific combinations of tags, using Boolean expressions: for example, the “Dried Fish Sample” was constructed using a tag query corresponding to [#RELEVANCE: Direct] AND NOT [#exclude], while the aggregate tag [##THEME: food science] was created through a query corresponding to the expression [#THEME: food engineering] OR [#THEME: food chemistry and microbiology] OR [#THEME: food safety]. Beyond these similarities, Zotero offers more robust methods for documenting and analyzing structured metadata than QDA software. While the most significant metadata are captured in basic bibliographic fields – author, title, year of publication, and publication type – Zotero provides a total of 125 distinct metadata fields, allowing documents to be catalogued, sorted, and searched by creator type, conference title, and the like (Corporation for Digital Scholarship 2020).

An area in which Zotero proved unexpectedly useful was in facilitating a collaborative workflow. During the course of our thematic tagging, we adopted a variety of procedural tags, intended to communicate messages to other members of the teams during their subsequent review of the library items. For example, we used an exclamation mark [!] to indicate a reference of particular interest to the team; tags prefixed with the commercial at symbol [@] to indicate that a reference had been manually reviewed, cited in another context [@cited-WG2], or assigned to a particular reviewer’s queue [@EDT]; and question mark-prefixed tags such as [?geo], [?theme], or [?noPDF] as temporary codes to indicate when the person tagging was uncertain about a

³⁵ QDA tools such as Atlas.ti, which are designed to support grounded theory research, help researchers write texts within the software using memos that are linked to quoted passages. Zotero accommodates a comparable workflow: notes can be both tagged and linked to other related items, including other notes; the development version of Zotero also allows notes to embed citations to items in the bibliography, and for notes to be imported directly into a word processor along with their linked citations.

particular tag, or to flag items to discuss with the author group for a collective decision.

Changing scope: Google Scholar and sampling

Our decision to assemble and describe a *dried fish literature* involved a change in scope, from our original goal of analyzing contemporary literature by country in South and Southeast Asia, in favour of a global thematic study with attention to geographic coverage. This shift was partly a response to feedback from the SSHRC Expert Panel that had reviewed our project application, and that had recommended a more global and historically informed study:

The panel noted that, with rare exception, the literature review is limited to sources in the 21st century. This is understandable given the relative ease of accessing current literature electronically. As the project unfolds, literature from the dark ages (i.e., before the internet) might well reveal additional material of historical importance.

The panel also suggests the literature review be expanded beyond the regions in question. For example, the cod fisheries of Newfoundland were driven originally by production and trade of dried fish, something that continued over well into the 20th century. Dried fish is an important product in other parts of the world as well. Without diluting the focus on South and Southeast Asia, the researchers might benefit from situating these regions in a larger global history of dried fish.³⁶

The recommendation to consider an expanded scope for this project did not directly inform our design of the reference management workflow built on Google Scholar and Zotero. We quickly discovered, however, that these two tools would facilitate – and indeed become indispensable to – a much larger, comprehensive review. Due to the facility with which they allowed us

³⁶ SSHRC Expert Panel Report, Partnership Grant Application number 895-2018-1017, 2017-12-12.

to collect and analyze a large volume of publications, these tools indeed encouraged us to set a goal of creating a census of the global dried fish literature.

Had we limited our review, as we might have done fifteen or twenty years ago, to the publications we could retrieve through our local library, the shape of this study would have been entirely different. In the absence of a full-text search database (Google Scholar), we would have been forced to rely on the subject listings available in our library catalogue, which would have produced only a handful of references. Recreating a sample based on the publisher-supplied keywords extracted by Zotero for each item in our library, we would have obtained a sample of only 235 publications in a search for keywords that partially match the terms “dry” OR “dried” AND “fish” (Table 1). Inclusion of grey-literature sources would have been far more tedious, as it would have required consulting multiple indexes for periodicals and government or intergovernmental agency reports. Limiting ourselves to academic articles and books, we would have ignored one in ten of the publications from our final collection – which includes 53 conference papers and presentations, 12 patents, 7 manuscripts and unclassified documents, 2 newspaper articles, 4 magazine articles, 53 technical reports, and 28 theses. In the end, we might have been satisfied to combine a ‘proximity sample’ of publications from our local library with a ‘convenience sample’ of known sources – such as the Dropbox folder of 93 items assembled at the beginning of this project, mainly collected during the course of Ben Belton’s own research in Bangladesh and Southeast Asia, and reflecting the thematic and methodological biases of that origin.

DRIED FISH MATTERS

Table 1. Number of items matching publisher-supplied subject keywords containing the terms “dried fish” or “dry fish”, within all sources returned through Google Scholar searches. Keywords are mutually exclusive

keyword	items
dried cod	1
dried fish	180
dried fish products	2
dried fish tourism	2
dried fish training abroad	1
dried flying fish	1
dried salt-cured cod	1
dried salted coalfish	1
dried salted fish	1
dried-fish	1
dried-salted fish	1
dry fish	31
dry fish consumption	2
dry fish export	1
dry fish industry	2
dry fish market	1
dry-curing fish	2
drying of fish	1
fish drying	3
TOTAL	235

To accommodate the broadened scope of our literature review, we conducted a second round of search queries in October 2019, adding a further 1016 items to the Zotero library. Our primary search queries employed the phrases “cured fish”, “dried fish”, “dry fish”, “fermented fish”, “smoked fish”, “salt fish”, and “salted fish” in combination with country-level geographic descriptors taken from the list of countries and territories recognized by the United Nations, extended by several regional sub-country descriptors identified by the researchers as of likely importance (e.g., “Indian Ocean”, “Newfoundland”). Supplementary searches were then conducted using product terms that emerged during the initial review, in an effort to capture publications that used local instead of generic terms for dried and fermented fish: “Bacalao” / “Bacalhau”, “Klipfisk” / “Klippfisk”, “Lutefisk”, “Stockfish”, and “Surstromming”. Unique results generated by variant terms (e.g., “UK” for “United Kingdom”) were consolidated into a normalized query tag referencing the primary term. Where a publication was retrieved by more than one search,

all applicable search queries were applied to that item.

Across the two rounds of searches, 553 queries yielded valid results, with a median of 5 valid results per query (Figure 3). Of the searches that produced the greatest number of results, the top five reproduced queries that had been present in the first search round (four of the five related to dried fish in India and Bangladesh); queries that yielded 20 or more items included the search terms including geographic keywords for Korea, the Caribbean, Brazil, Africa, the Philippines, and Zambia (Table 2).

Table 2. Search queries and number of valid results, rounds 1 and 2 combined. Round 1 searches are italicized

<i>"Salted Fish"</i>	79
<i>"Cured Fish" India</i>	46
<i>"Dried Fish" India</i>	41
<i>"Dried Fish" Bangladesh</i>	33
<i>"Fermented Fish" India</i>	32
"Fermented Fish" Korea	32
"Smoked Fish" Caribbean	32
<i>"Dried Fish" Andhra Pradesh</i>	31
"Dry Fish" Caribbean	31
"Salted Fish" Brazil	26

DRIED FISH MATTERS

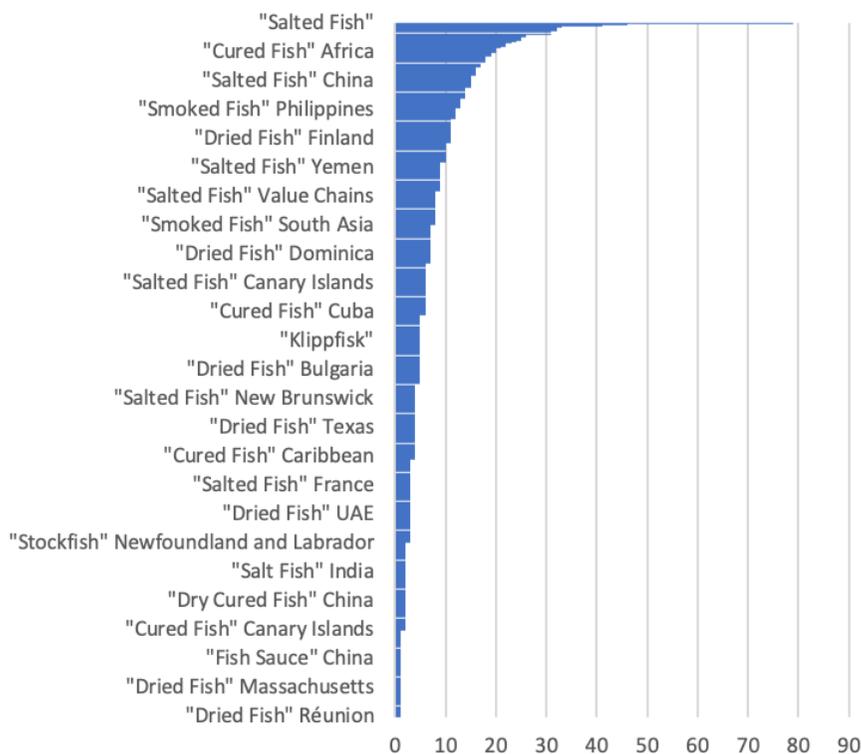


Figure 3. Number of valid search results per query, round 2 (553 queries total)

We are confident that, after several rounds of searches, our Zotero library constituted a reasonably complete representation of the dried fish literature. Yet our reliance on the proprietary crawling and search ranking algorithms of Google Scholar contributed to a result set that was not entirely within our control. The lack of transparency in Google Scholar's indexing and result ranking methods has been flagged by some researchers as a serious limitation, and an obstacle to the use of the search engine for rigorous purposes of systematic reviews or bibliometric analysis (Halevi, Moed, and Bar-Ilan 2017). We know from Google's own instructions for publishers that the indexing of sources in Google Scholar is intended to be comprehensive, by including any publication that has a distinct metadata (description) page that is publicly

accessible on the web containing an abstract. Google Scholar recognizes documents as scholarly publications either due to the presence of publisher-supplied metadata tags identifying the publication as a journal article, or through a combination of heuristic measures, including the layout of the document (i.e., a title at the top of the document, followed by authors and affiliations, and inclusion of a references or bibliography section), and hosting on a University web server or on another site using repository management software. The inclusion and ranking of documents in search results is influenced by the availability of a full-text version of the document accessible to Google, if the search keywords are not found within the document abstract; and by other factors including the number of inbound citations (Google n.d.).

By following the search strategy described above, we became dependent on a census/sampling methodology that was linked to Google Scholar, and whose methodological rigour was effectively defined in relation to the opaque operations – and limitations – of that search engine. We were able to include a reasonably wide range of sources, but not all pre-digital ('dark ages') or print-only resources from beyond the digital divide, let alone non-English-language publications. In our final sample, the median date of publication was 2008, or 10 years prior to the date of our first web searches; three quarters of our items were published in the year 2000 or later, and three-quarters of the remaining items were published in 1980 or later.³⁷

Many relevant non-digital publications were indexed by Google Scholar, and returned in search results, via AGRIS, a bibliographic catalogue managed by the FAO. AGRIS aggregates data on publications supplied by over 15,000 organizations, including academic libraries, research institutes, government agencies, publishing houses, private foundations, and international organizations. The index itself has operated since 1974 and includes "*books*,

³⁷ To counteract the regional bias, we invited our partners to incorporate scans of local sources into dedicated subfolders in the Zotero database, particularly theses, policy documents and legal texts, technical reports, and other primary or grey literature sources. Although we received some submissions, the process proved labour-intensive and technically challenging for some of our collaborators; in several cases, our partners were unable to locate any local publications that addressed dried fish.

journal articles, monographs, book chapters, datasets and grey literature – including unpublished scientific and technical reports, theses, dissertations and conference papers in the area of food and agriculture” (Food and Agriculture Organization of the United Nations 2022). Most of the items in this database do not provide full-text links; many refer to non-English sources; and quite a few entries point to older, print-only sources that are available in the catalogues of data provider institutions. Our Zotero library includes 166 items retrieved from the AGRIS database, 118 of which we excluded from the dried fish sample due to the unavailability of the source material (including instances in which the listed item was an unpublished conference paper), lack of bibliographic detail other than the author and title, or publication in a non-English-language source. 80 percent of the items returned from AGRIS belonged to the ‘technical’ category.

Tagging

Google Scholar supported a census-type literature survey by allowing us to locate a very large and comprehensive dataset of publications based on matching terms from their full-text content. Just as importantly, the Zotero reference manager allowed us to combine the results of multiple searches to support large-scale analysis, collecting the abstract and metadata for each publication and a copy of the text itself.

The original plan for this literature review was to limit our attention to the countries included within the Dried Fish Matters project, focusing on two major axes: countries of focus (India, Bangladesh, Indonesia, Myanmar, Cambodia, Sri Lanka, and Thailand), and thematic coverage. In the thematic coverage axis, we made a broad distinction between ‘technical’ literature – primarily associated with the disciplines of biology, nutrition, and food science – and a set of smaller themes associated with history and anthropology, economics, ecology, and policy and development studies. As the geographic scope of our literature review expanded, we were forced to explore alternatives for simplifying our approach. In one of the earliest iterations of our tagging strategy, we developed an analytic frame that would combine

four axes of interest – theme, region, date, and fishery type – which would have involved 72 combined tag permutations (Table 3). In later iterations we chose to remove the date and fishery variables, making room for product type and value chain segment variables, and increased the number of top-level regions to 11 while reducing the top-level themes to 5.

Table 3. Original analytic frame for the literature review, showing prefixed Zotero tags

Theme	Region	Date	Fishery
#THEME: ecology	#REGION: South Asia	#DATE: Contemporary	#FISHERY: coastal
#THEME: economy	#REGION: SE Asia	#DATE: 20 th Century	#FISHERY: inland
#THEME: gender		#DATE: pre-20 th Century	
#THEME: nutrition and food security			
#THEME: policy and governance			
#THEME: value chain			
#THEME: well-being			

Most of the thematic tags used in our final analysis relate to areas of particular interest for our own work. [Cooking and food] relates closely to the broad [Culture, social relations and well-being] tag, and to our original search term “consumption”, but highlights the importance of food as a symbolic marker. [Gender] is also a sub-tag of the [culture, social relations, and well-being] tag, and reflects our assessment that gender is profoundly important in the analysis of social economies of dried fish and often an important axis of distributional inequalities. [Gender] and [labour] cut across the value chain, and are important points of reference in normatively evaluating its functioning. The [economy] tag refers to broad, macro-economic analyses of the place of dried fish in economic systems, as well as to the value created through micro-economic activities. The [history and change] tag includes

two analytical dimensions: references that are overtly historical in their orientation, in the sense looking at patterns of dried fish use in the past, or references that have a diachronic aspect to them, but are present-oriented. Finally, we used the [ecology] tag to mark references that include attention to the biological or ecological linkages that connect dried fish economies to their environments. The remaining three tags are linked to two objectives of DFM. A key part of the project’s motivation is the intention to generate applied insights in nutrition and health in particular. These are areas, of course, linked to wellbeing and social and economic relations. Our project recognizes that existing and potential governance systems and policy regimes facilitate or constrain action, and therefore must be an important area of attention.

Table 4. Evolution of our thematic categorization. Original Google Scholar search terms were matched to thematic tags, two of which were combined (“well-being” and “culture” into “culture, social relations & well-being”) and one of which was split (“technical” into “food engineering”, “food chemistry and microbiology”, and “food safety”) during the course of analysis. In the final stage, these tags were grouped into five thematic clusters, as discussed below.

Topic	Search terms	Initial thematic tags	Revised thematic tags	Thematic cluster
economics	demand	value chain / microeconomics	economy labour	value chains, economy, and labour
	value chains			
	economics			

health	health	nutrition and food security	nutrition and food security	food and nutrition security and health
	food security			
	nutrition			
social relations	gender	gender	culture, social relations & well-being	culture and social relations
	women			
	wellbeing			

	ethnography			

technical interventions	technology	Technical	food engineering	food science
	---		food chemistry and microbiology	
	---		food safety	
	---		policy and governance	ecology, policy, and governance*
---	ecology			

**[1] ##THEME: ecology, policy, and governance” represents a kind of “other” category, catching applied themes that are significant to the general fisheries literature (natural resource management, fisheries policy, governance) but that are not yet explicit in dried fish literature.*

Computer-assisted analysis

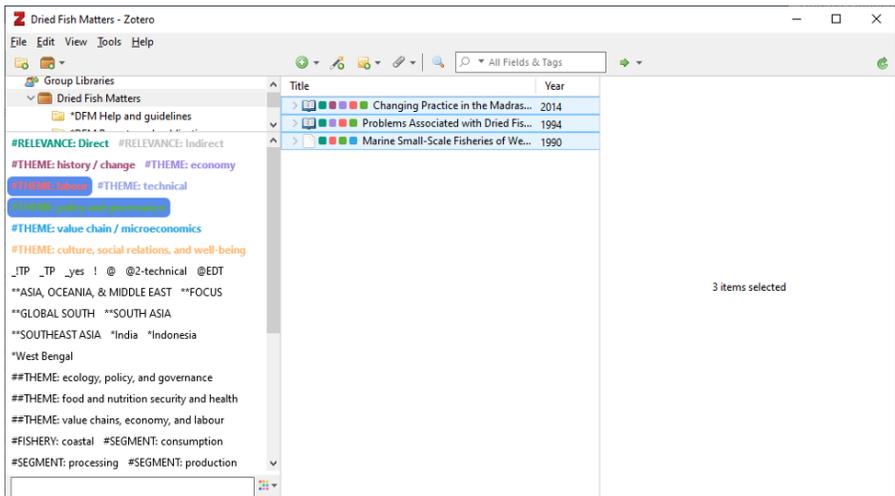


Figure 4. Manual analysis of tags using the Zotero desktop client

It is clear that although we could have completed a review of the dried fish literature without the assistance of Google Scholar or Zotero, in the absence of those tools we would almost certainly have sought to conduct a review of significantly reduced scale, or used familiar sources to produce the background section for an original research work. We might have looked in greater depth at available resources for selected qualitative evidence to support our definitional claims, without attempting to provide a quantitative survey of our literature census. In working with Zotero, we found that the easiest place to begin our study was with a quantitative review, as the

software allowed us to retrieve quick counts of publications tagged with a given keyword or set of keywords. While these counts could be generated quickly within the desktop program interface (Figure 4), Eric Thrift suggested the possibility of automating this process through the Zotero’s Application Programming Interface (API), a command-based interface designed to be accessed over the web by computer scripts. The Zotero API (Stillman 2021) allows users to build tools that query or update a Zotero library, essentially replicating the functionality of the desktop client by assigning URL ‘commands’ to each operation that would be performed interactively with a keyboard and mouse. An open-source library exists to facilitate simple queries using scripts in the Python programming language, which can be as simple as three or four lines of code (Hügel et al. 2022). For example, the following code prints the titles of the first three items in the Dried Fish Matters Zotero library (“2183860” is the identifier of our group library):

- `from pyzotero import zotero`
- `zot = zotero.Zotero('2183860', 'group')`
- `items = zot.top(limit=3)`
- `for item in items:`
- `print(item['data']['title'])`

We found the Zotero API useful in generating a spreadsheet item counts by tag, the largest volume of which reflected geographic regions. During our tagging process we had applied tags representing over 100 countries and regions, which we subsequently wished to aggregate for analytic purposes into various types of groupings – continents, Global North/South, ‘focus region’ (South and Southeast Asia), and so on. For each of these geographic regions, we expected to see significant differences in coverage of specific themes or product types within the dried fish literature. The figures showing these correlations would have taken many hours to compile manually, and – most importantly – we would have been discouraged from repeating the analysis following further interaction with the Zotero library. By automating this process, we only needed to list the tags we wished to combine and correlate

once; this allowed us to review and present preliminary findings, then use those findings to refine our searching and tagging efforts, leading to an iterative analysis. We were also able to adjust our geographic categories, for example by shifting Middle East resources to the category of Western Asia from their initial identification as part of Africa.

As our work progressed, Thrift developed our Python scripts into a command-line utility that not only allowed us to query the library items by tag, but also to undertake a number of other operations. For example, the scripts can create and apply 'cluster' tags that aggregate geographic regions, themes, or product types, making these available for analysis in the desktop client; compare the tags in the library against a list of tags in a working list; create a spreadsheet listing the number of articles in the library published in each journal represented in the database; or print a bibliography containing a list of tags under each item (Thrift 2022). A command that generated bar graphs out of tag union queries was spun off into a web-based script, designed to take lists of tags and graph options through an online form and return basic quantitative measures about the distribution of references matching the user query in the form of an html table or bar graph (Thrift 2021b).

Visualization and knowledge construction

This visualization utility allowed us to play around interactively with a variety of search parameters to generate the series of graphs that were ultimately included in our literature review, and to update figures as the library data evolved. It also shaped our conceptualization of the dried fish literature, not simply by drawing our attention to visually apparent differences in thematic coverage between different regions, but also by encouraging us to *construct* visual differences between different themes, through repeated experimentation with graph and data parameters to achieve the most legible graphs. For example, Figure 5 represents an initial attempt to map significant themes by major geographic region, which we subsequently revised through modification of our analysis parameters. Each bar in the graph represents the number of publications in the dried fish literature that was tagged as

belonging to a particular theme, with bars colour-coded by theme and clustered by region. Although this graph accurately conveys the quantitative data present in our database, it is not particularly legible: the ‘technical’ bar for Asia, Oceania, and Middle East dwarfs all the other themes, causing the scale of the graph to make distinctions in smaller clusters less intelligible; the overall distribution of references within each cluster is evident, but it is difficult for us to perceive the total number of publications for each theme; and the large number of colour-coded categories makes it difficult to read the graph without looking back and forth repeatedly between bars and legend.

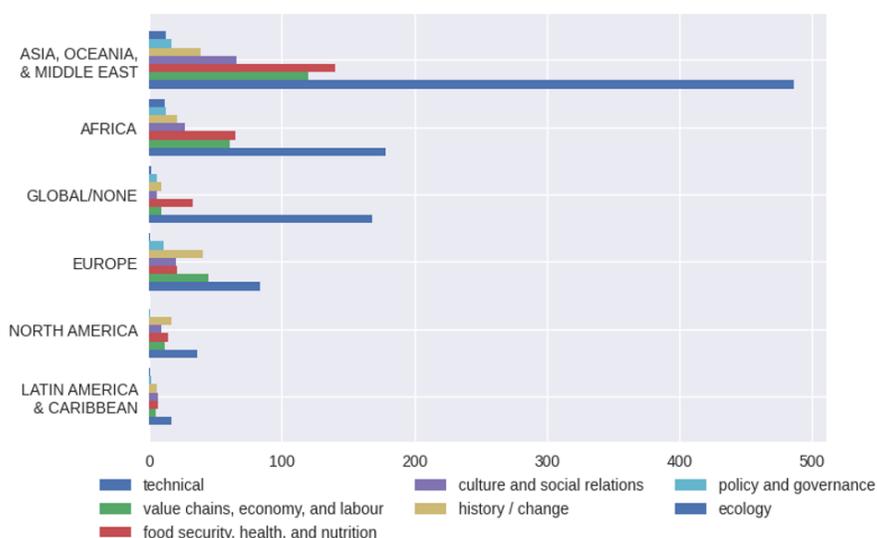


Figure 5. Original bar graph showing the distribution of themes by continent in the Zotero library, by count of items matching each combination of theme/continent tag. As tags are not mutually exclusive, some sources are represented more than once. All items in the library were tagged with at least one thematic tag and at least one geographic tag. In an editorial comment on this graph in a draft of our literature review article, one of the co-authors wrote: This figure isn't too useful in its current format since there are too many categories. There are two options to deal with this: (1) conflate the regional categories (e.g., "Asia &

Oceania”, “Americas”, “Africa”, “Europe”) or (2) generate a selective set of bar graphs for individual themes. We can probably exclude the themes like “ecology” that have almost no coverage anyway.

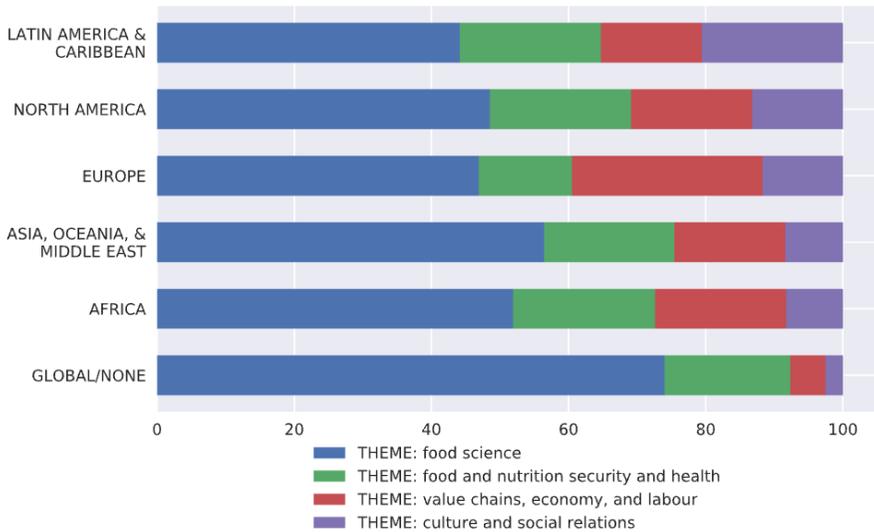


Figure 6. Themes by continent: updated graph

A second version of this graph (Figure 6), also unused in our final review, displays the same data as stacked bars – but here we have only four thematic categories instead of seven, representing clusters of themes. An intermediary version of this graph presented the same clustered bars as percentage of the overall literature; now we have percentage-stacked each group, reducing the content of the graph to show only the relative proportion of texts for each region that address a particular theme. The grouping of themes was not an analytic imperative, but one that was originally driven by visualization concerns; yet it ended up shaping our final analysis, in leading us to assert that the dried fish literature is organized by a particular set of value concerns corresponding to these legible clusters – *dried fish as food*, *dried fish as commodity*, and *dried fish as cultural heritage* (Belton et al. 2022 Figure 7).

DRIED FISH MATTERS

Similarly, we created cluster categories of fish products in order to simplify representation (Figure 7), opting to represent the categories dried fish, salted fish, fermented fish, smoked fish, fish sauce, and “other”. These categories absorbed the further five categories of fish crackers, fish paste, fish powder, pickled fish, and derivative products. The choice to limit our representation of the literature themes to proportions of sources by continent speaks to the reductive demands of our work, whereby our efforts to capture the essential features of the literature topography were driven by the visual medium available through the graphing tool.

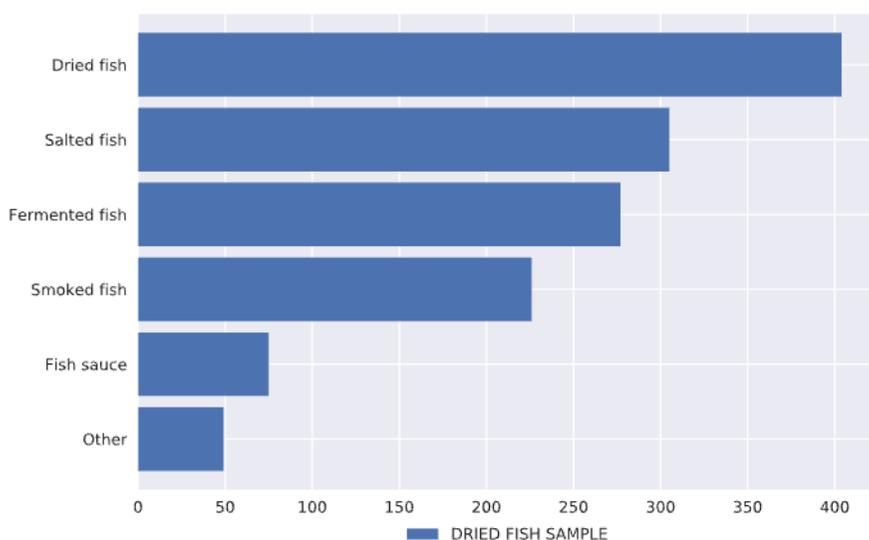


Figure 7. Dried fish product types. All items in the Zotero library were tagged with zero or more product types

Insofar as the quantitative section of our review was structured as a discussion of these graphs, our interpretive commentary also downplayed or excluded points related to graphs that were cut from the review due to poor visual effectiveness, while highlighting points of strong visual interest. For example, in our discussion of Figure 8, we observe “*proportionately greater coverage of the*

Global South than is apparent in the general fisheries literature sample ... suggesting that the literature on dried fish mirrors global geography of fish production and consumption more closely than the general fisheries literature". We also suggest that "the literature on dried fish in Asia accounts for nearly half of tagged references ... Africa and Europe also each have substantial literatures, while references on the Americas are much smaller proportionately". Significantly, each of these points is made as an interpretation of the accompanying graph, rather than the graph being constructed as an illustration of these claims.

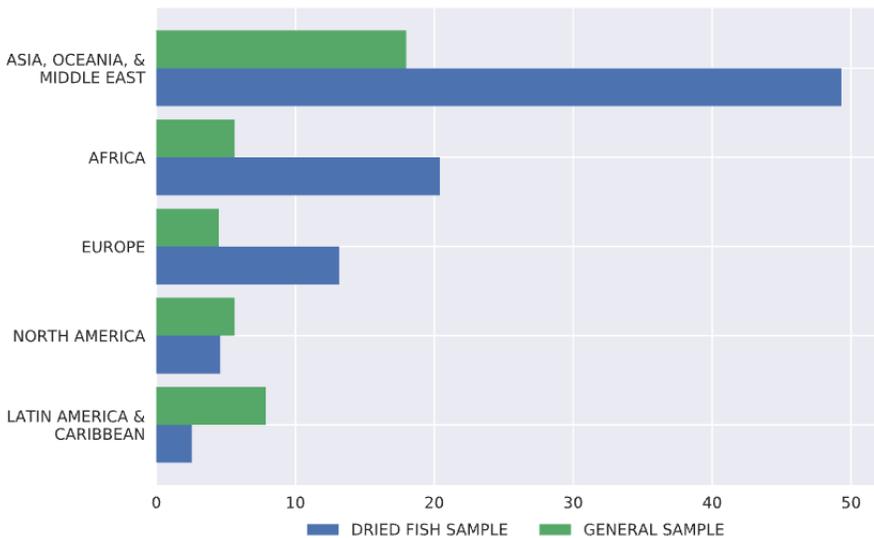


Figure 8. Geographic comparison of the dried fish literature to a "general fisheries" sample, by percentage of items in each sample tagged with each continent-level geographic tag

Our sequence of tagging, quantitative analysis, and finally (qualitative) discussion was established in the interest of convenience, as quantitative results could be achieved soonest through a more superficial triage and tagging of the literature. But this organization resulted in the qualitative analysis being structured by the quantitative review. A review of a smaller,

communications within a complex information system. These tools, and the additional utilities we may develop to interact with them, structure research workflows in ways that ultimately present strong impacts on the knowledge we create. Our experience using Google Scholar and Zotero illustrates this point: rather than simply increasing the efficiency of a manual workflow, these tools enabled and encouraged a reimagining of the ‘literature review’ as a comprehensive census of digital sources, analyzed quantitatively, and represented through semi-automated visualizations of tag correlations. The construction of a bibliographic database containing thousands of publications have been inconceivable without this technology – not only in the sense of being impossible to achieve, but also in the sense of being impossible, literally, to *conceive* in the absence of workflows suggested by the technology itself. We discovered that technology allows, invites, and even demands us to work at scale. We have found ourselves making knowledge claims about a global ‘dried fish literature’ *instead of* – and not necessarily *in addition to* – more limited claims about ‘dried fish in India’ or ‘dried fish in South Asia’, as we had originally envisaged. This shift in perspective is due, in no small part, to our selection of tools.

References

Belton, Ben, Derek Johnson, Eric Thrift, Jonah Olsen, Mostafa Hossain, and Shakuntala Thilsted. 2022. Dried Fish at the Intersection of Food Science, Economy, and Culture: A Global Survey. *Fish and Fisheries*. <https://doi.org/10.1111/faf.12664>.

Corporation for Digital Scholarship. 2020. Zotero Item Types and Fields. https://www.zotero.org/support/kb/item_types_and_fields.

Corporation for Digital Scholarship. 2022. Zotero: Your Personal Research Assistant. 2022. <https://www.zotero.org/>.

Dried Fish Matters. 2021. Global Dried Fish Literature Review Database.

University of Manitoba. <https://doi.org/10.34990/FK2/UEECDM>.

Food and Agriculture Organization of the United Nations. 2022. AGRIS Homepage. 2022. <https://www.fao.org/agris/>.

Google. n.d. Google Scholar Help. Accessed January 28, 2022. <https://scholar.google.com/intl/en/scholar/inclusion.html>.

Halevi, Gali, Henk Moed, and Judit Bar-Ilan. 2017. Suitability of Google Scholar as a Source of Scientific Information and as a Source of Data for Scientific Evaluation—Review of the Literature. *Journal of Informetrics* 11 (3): 823–34. <https://doi.org/10.1016/j.joi.2017.06.005>.

Hügel, Stephan, Peter Gerdes, Sky Bristol, and Pablo Orduña. 2022. Pyzotero 1.5.1 Documentation. 2022. <https://pyzotero.readthedocs.io/en/latest/>.

Ivey, Camille, and Janet Crum. 2018. Choosing the Right Citation Management Tool: Endnote, Mendeley, Refworks, or Zotero. *Journal of the Medical Library Association: JMLA* 106 (3): 399–403. <https://doi.org/10.5195/jmla.2018.468>.

Johnson, Derek, Benjamin Champion, Ratana Chuenpagdee, Jessie Varquez, and Ansen Ward. In press. Small Fish Processing. In *Small Fish for Food Security*. FAO Technical Papers. Food & Agriculture Organization of the United Nations.

Johnson, Derek, Jonah Olsen, Eric Thrift, and Ben Belton. 2019. Comparing Economies of Dried Fish in Asia: What the Literature on Six Countries Tells Us. Conference paper presented at the MARE People & the Sea X Conference: learning from the past, imagining the future, University of Amsterdam, June 26.

Johnson, Derek, and Eric Thrift. 2020. Using Zotero to Structure a Global

Literature Review on Dried Fish. Presented at the TBTI Transdisciplinarity course, Online, October 8.

Martín-Martín, Alberto, Enrique Orduna-Malea, Mike Thelwall, and Emilio Delgado López-Cózar. 2018. Google Scholar, Web of Science, and Scopus: A Systematic Comparison of Citations in 252 Subject Categories. *Journal of Informetrics* 12 (4): 1160–77. <https://doi.org/10.1016/j.joi.2018.09.002>.

Martín-Martín, Alberto, Mike Thelwall, Enrique Orduna-Malea, and Emilio Delgado López-Cózar. 2021. Google Scholar, Microsoft Academic, Scopus, Dimensions, Web of Science, and OpenCitations' COCI: A Multidisciplinary Comparison of Coverage via Citations. *Scientometrics* 126 (1): 871–906. <https://doi.org/10.1007/s11192-020-03690-4>.

Stillman, Dan. 2021. Zotero Web API Documentation. Zotero Documentation. November 5, 2021. https://www.zotero.org/support/dev/web_api/v3/basics.

Thrift, Eric. 2021a. Online Tools for Collaboration in a Time of COVID-19. Conference paper presented at the MARE 2021 People and the Sea Conference, Online, June 30.

Thrift, Eric. 2021b. *Zotero Tags Graphing Tool*. Python. Dried Fish Matters.

Thrift, Eric. 2022. *Zotero-Meta-Analysis-Toolkit* (version 1.0). Python. Dried Fish Matters.

Thrift, Eric, Ben Belton, and Derek Johnson. 2020. Dried Fish in Global Perspective: Themes and Knowledge Gaps from a Multidisciplinary Literature Review. Webinar, December 10.

Winslow, Rachel Rains, Sarah L. Skripsky, and Savannah L. Kelly. 2016. Not Just for Citations: Assessing Zotero While Reassessing Research. In

DRIED FISH MATTERS

Information Literacy: Research and Collaboration across Disciplines, edited by Barbara J. D'Angelo, Sandra Jamieson, Barry Maid, and Janice R. Walker, 287–304. The WAC Clearinghouse; University Press of Colorado. <https://doi.org/10.37514/PER-B.2016.0834.2.14>.

31. Researching the Researchers: A Study of Communication Effectiveness in an International Project

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Have you ever wondered how communication happens in a research team, and what happens when researchers have to collaborate internationally with other researchers?

We looked at this question through a case study focused on a large international project called Dried Fish Matters (DFM). The case study was part of Alexia Pigeault's MA thesis, supervised by Dr. Fabiana Li. The DFM project involves more than 30 co-Investigators, 15 collaborators, and 20 institutional partners from eight different countries in South and South East Asia (see Figure 1), and is directed and coordinated by anthropologists working from Canada. An important aspect concerning this study is that the researchers do not have the same educational or disciplinary background. Despite the project's interdisciplinary nature, the researchers have one thing in common: their passion for dried fish as a research topic.

DRIED FISH MATTERS

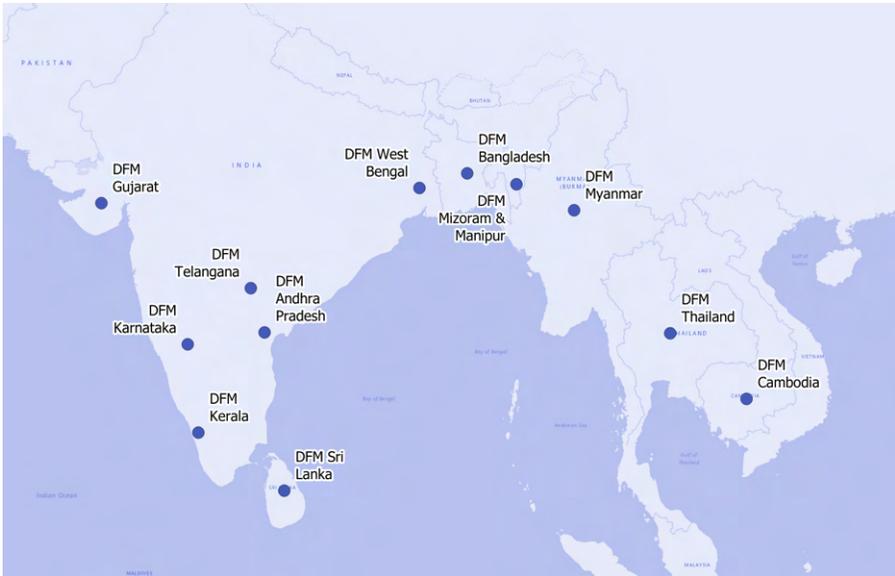


Figure 1. Map of the 13 research teams working within DFM (number 13 represents the student group). Source: Authors

Interdisciplinarity is something that funding agencies, universities, and other organizations are increasingly encouraging. Interdisciplinarity enhances creativity, learning, collaboration, and equilibrated qualitative results. In theory, this sounds great! However, there is very little training about how to work in interdisciplinary teams within the research environment. Thus, interdisciplinarity can also bring conflict, chaos, misunderstandings, and other problems linked to communication. Taking the example of DFM, how does communication structure knowledge about dried fish, and how do power relations shape communications?

The word communication has many meanings, but it is often defined as a one-way process allowing the successful dissemination of a message to a targeted public. However, communication is broader than just words. According to one of our interviewees, it is also about “*communicating sentiment, keeping channels open (e.g., having meetings and not talking about anything is also a form of communication), it’s not just the message but the creation of a*

social bond.” This is one of the responses given when we asked researchers about the definition of communication, which evoked quite varied answers. Communication is not something that we are taught in school or university; it is something that we learn continuously by interacting with people. When participating in the DFM project, researchers learn new ways of communicating with their colleagues, which in turn shapes how knowledge is produced and how it is presented to partner organizations and the general public.

This process of communication as co-learning is a crucial aspect of collaborative research, but it is not always made explicit in project design. Our study highlights the need for a reflexive approach where researchers consciously think about, regularly evaluate, and recalibrate their communication strategies as needed. This process of self-reflection (at a personal and group level) can help make visible aspects of communication that are often taken for granted, naturalized, and not prioritized in project management.

When studying the internal work of DFM, one thing that became evident is that the passion for studying dried fish unites the researchers involved in the project. This affective connection to the research subject attests to the multifaceted nature of dried fish – its economic, social, cultural, ecological, and nutritional value. Dried fish is embedded in social connections, and the same can be said about the research networks that have formed to study its many dimensions. Indeed, the world of research in the dried fish sector is quite small and researchers tend to already know each other, which points to the importance of social and professional networks in research collaborations. Moreover, these researchers are concentrated in Asia and South East Asia because of the cultural and nutritional value of dried fish in these regions. One of the participants of this study explained his vision concerning the importance of dried fish as a research subject:

“The major contribution of DFM will be to expand the body of knowledge and understanding about an aspect of human life that is very important in Asia and globally. The evocation of the importance of dried fish from a culinary, cultural, and even poetic perspective is going to be a major area of contribution. And also,

just laying out a new vision of the place of dried fish in the world of knowledge, and the world of research, changing the shape of that knowledge, and the discourse around dried fish.”

DFM started with a shared interest in dried fish where researchers and students were thrilled to be part of this exciting and groundbreaking initiative. In some cases, they already had a personal connection to dried fish (whether through previous studies or lived experience) and to the region of study. Many of them were excited about the results of the study, especially concerning the comparison of the 6 different countries. Thanks to this common dedication to this field of research, the participants were able to work together despite challenges associated with working on a large international project.

The difficulties that can arise when working as part of a large team relate to inter-cultural communication, power hierarchies, language barriers (including the use of English as a working language among multilingual participants), and time differences between locations where researchers are based. Indeed, several complaints were made related to time zones. There is a big time difference between Canada and Asia: when it is morning in Canada, it is evening/night in Asia. Many researchers also have a family, and it was sometimes difficult for them to attend some meetings because of the time difference and family commitments. On top of that, Zoom fatigue can be felt after multiple meetings during the day. As one interviewee commented, after five meetings in one day, it can be hard to remember the last one, and especially to be able to pay attention to the dialogue.

Other challenges include the tensions that can arise due to uneven power relations based on gender, age, class, education, and nationality. There are hierarchies that exist in society, including ones based on gender relations that may be reproduced within the project. Even language use produces unequal power relations, since being able to understand, speak, and write in English is a privilege. How people participate in the project and relate to others might be influenced by their understandings of power inequalities between ‘North and South.’ One of the participants of the study explained:

“The problem with the world is that we use the West as a standard. Everybody needs to write in English [...] It’s a bit of privilege and sometimes people forget. We need to pay attention to that. The challenge is there because people from the Global South need to adapt, modify, adjust, to [be] this kind of standard. [...] They can claim that it is a better standard but I think it’s that ignorance of the world or their laziness about the world, it is an easy sectoring. This applies for the ethics application, the consent form. [...] Researchers in the South, they have different ways of going about things and sometimes it could be better but the standard is set and should not be imposed. The difference is when you make people feel that “I want to do better, I want to follow a higher standard because it will reflect a better work” as opposed to [the standards being] imposed and people don’t get what nonsense is this. Communication about that is important.”

In addition to navigating the complex internal dynamics of a large project, a significant challenge that could not have been predicted at the start of the DFM project was the onset of the COVID-19 pandemic. At first, the DFM coordination plan was to have at least one meeting per year in person in one of the study countries. Unfortunately, COVID-19 made it impossible to meet in person, especially with an international project of this size. The project’s continued productivity during the pandemic rested on the ability to adapt as needed, change plans, and develop new tools for effective communication. Although remote work is a major tool in the fight against the spread of COVID-19 and its variants, this alternative work mode is not suitable for everyone. Some collaborators do not have a suitable work environment at home, have difficulty concentrating or simply cannot tolerate remote meetings. DFM is not an exception in this crisis and since 6 countries, including Canada, are involved within DFM they were not spared in social distancing and telework. From the beginning of COVID-19, every participant within DFM worked remotely, and the scoping phase was delayed for the majority of the countries working within DFM. Meetings were done on Zoom except for some countries that were able to still meet in person for their informal meetings inside their research team. Amongst the participants interviewed there is consensus that COVID-19 is the biggest challenge the

project faced. However, the project director, Derek Johnson, shared some of the positive aspects of working remotely:

“I would also mention that prior to COVID, I felt there was more of a gap between me and the participants in the project. Part of that was just my intimidation at using long distance communication technologies, even using the phone. I felt that those technologies posed a barrier. It was not because I couldn’t use them but because I had this idea that the technologies themselves created a sort of distance between me and the participants. But the whole COVID experience has completely eased that concern. Now, I have very little hesitation to do a Zoom meeting or a chat. That was one problem that was much stronger before in the project and that really eased.”

As COVID-19 started, some of the country teams were still able to have in person meetings; however, this was not possible for everyone, and especially not for the global international meetings. Online technologies were the solution, and this is how Zoom meetings started (see Figure 2). Online communications have some advantages, such as the chat box in video meetings that allow to participants talk to the whole group or specific individuals. Breakout rooms with smaller teams can help to enhance engagement from participants, and it is possible for every member of a team to edit the same document with Google Docs, for example. It is also possible to record every meeting for those who were not present. Unfortunately, online communications are not always sufficient to replace face-to-face interactions. It can bring other difficulties depending on the location of the individuals and resources available. Indeed, a stable internet connection, office space, and high-quality equipment can sometimes be lacking, especially in countries within the Global South, and the need to address these problems was frequently brought up in interviews with participants. An unstable internet connection and audio problems can impede comprehension of the meeting or the event. On top that, being in different time zones has direct consequences on the presence of participants in meetings, since most of the time they were happening during their evening, which interferes with family time, as discussed previously. Lastly, efficient equipment, especially headphones,

were sometimes lacking, which affects sound quality and comprehension.

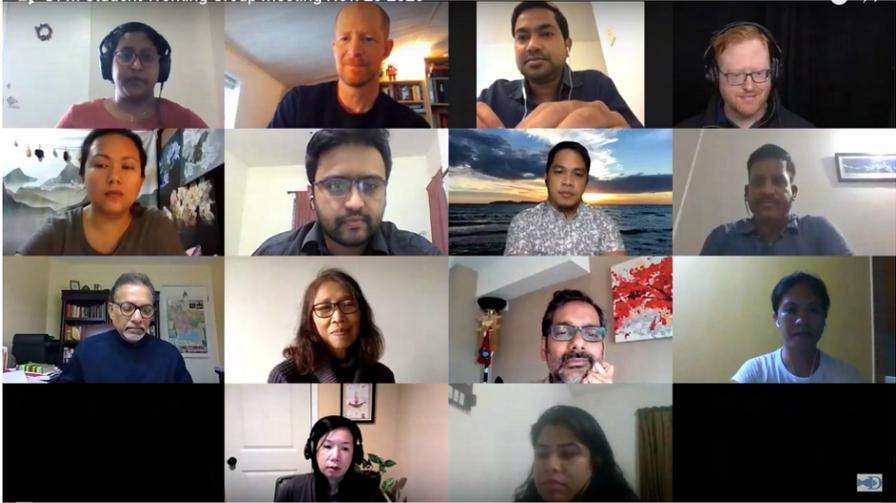


Figure 2. Screenshot taken during one the student group meetings

These technical aspects are only one part of what communication is about. Communication is also a social endeavor and contributes to relationships among project participants. This is one of the most difficult challenges to overcome in the context of the COVID-19 pandemic. As one of the DFM members explained:

“[It’s] hard to discuss social relationships that are not that social. We have had meetings over Zoom, that sort of interaction (informal conversation) gets lost. This is something I do miss a little bit. I felt much stronger social bonds within other places.”

In our study of DFM, we explored whether communications in a research project can also be influenced by personality traits, such as whether a person is introverted or extroverted, or whether they like to work in groups or independently. One of the researchers shared their experience of online

communications:

“There are some working group meetings [where] because of the number of people and the fact I don’t know them all, even if I have an opinion, I reserve it to myself unless my name is called. There’s that kind of a limitation, if we were doing it face-to-face we could speak at the same time [with] 2-3 people but with Zoom, you have to wait and somebody has to raise their hand and probably lose the train of thought. Most of the time I feel that way. I choose to be passive and to listen.”

In terms of personality traits, according to the results of our study, none of the interviewees considered themselves individualists; the majority told us they were team players, while the rest considered themselves to be a combination of both (individualists and team players). Moreover, out of 15 participants, 11 identified as being more on the introvert side than the extrovert side. In the quote above, we can see the difficulty that introverted participants might have in speaking during Zoom meetings. Indeed, introverted people might need to have face-to-face interactions, or one-to-one conversations to be able to express their thoughts and points of view.

Online communications and remote research can have both positive and negative impacts on research. COVID-19, and the need to rely on these communication strategies, changed how people relate to them. When doing research, it is important to evaluate the needs of your team, and how online communication affects them. It is also essential to be creative during online meetings, and to give enough space to everyone. One of the tools to explore this aspect is the breakout rooms that were tried during one of the last global DFM meetings. People seemed to be extremely curious about the other countries, and it was people that didn’t speak often that were taking the lead. This is something that should be repeated in future meetings in order to let everyone speak (for example, dividing people into small groups and giving them different questions to discuss). These new strategies for communication that emerged from working remotely can be carried over into in-person meetings.

Even though the period of working remotely has come to an end and we

have moved into a 'post-COVID world,' the virtual technologies and other innovations that were boosted because of COVID-19 have not disappeared. These changes have brought some advantages, especially in facilitating more regular communication between people despite geographic distance. In-person meetings have come back, but the post-COVID world will likely produce a hybrid between old and new forms of communication. To compensate for the fact that most DFM work was done remotely for two years, without in-person meetings, it is important to bring back the social aspect and closeness between colleagues. DFM should try to organize in-person meetings in the partner countries that involve all participants and students. While the program needs to focus primarily on research and project activities, it is important to also schedule time for more personal interactions, breaks throughout the day, and fun activities (for example, for a bit of humour, a quiz could be created with questions related to dried fish, the teams' results, or anything else related to DFM). Group dinners or field trips related to dried fish could be very interesting and give people opportunities to talk informally, bringing them closer together.

Building social relationships and understanding across our differences is especially important for DFM, since one of the key features of the project is its interdisciplinarity. Each team is composed of different co-investigators, collaborators, and partners within the social sciences (especially anthropology and economics) and biology/environmental studies. Regardless of disciplinary background, all researchers have the same purpose: that is, to study the historical, social, and economic importance of dried fish, the nutritional safety and livelihoods of marginalized people, and urgent threats such as ecological changes and industrial competition. In total, there are 13 teams in 6 different countries within the project, and some of them are working within the same country. This complex structure requires careful planning for effective communications. In addition to DFM general meetings that are open to all participants, team meetings and country meetings are essential for coordinating activities and building team cohesion.

Every project has its own challenges; however, international projects and virtual projects have a lot of them, known as 'influencing factors of

communication. In the results of our study, we highlighted the main influencing factors within the global project and within research teams: varied definitions of communication, social relationships, hierarchy, culture, collaboration, personality traits, language, management issues, challenges for countries within the Global South, and time zones. With all these factors at play it is important that researchers have a look at their own communication within their teams and projects.

To our knowledge, there isn't any training for researchers on communication to help them as project directors, project coordinators, or just as a member of the project to ensure effective communication within the study. The government of Canada has implemented an Ethical Conduct for Research Involving Humans called TCPS 2. This represents a small amount of training that can help researchers from the social sciences to ensure the ethical conduct of research and navigate between the two main goals: providing the necessary protection of participants and serving the legitimate requirements of research. Researchers are learning about protecting participants' rights and communicating the results of their study. However, they are not learning about communications within their study, and how communications can be more effective to produce better outcomes. Knowledge co-production doesn't seem to involve a lot of training, which leaves the researchers on their own to learn by trial and error. Academic researchers do not typically receive training in areas such as project management, team development techniques, conflict resolution, and interpersonal or cross-cultural communication. We strongly recommend professional training and capacity building for participants in collaborative projects. If such training is difficult to obtain, we hope that our study can encourage researchers to approach this aspect of their work with self-awareness and introspection.

DFM brings scientists together in collaboration with the aim of co-producing knowledge. Interacting with other researchers from different disciplinary and cultural backgrounds can reveal knowledge biases and can make science more creative and dynamic. DFM and this study can be models for other research and development projects that depend on effective communications to meet their objectives. However, it would be unwise to

propose a single method of evaluating communication effectiveness or one mode of communication. Since every project has different influencing factors dependent on its structure, it is impossible to generalize based on this work. Nevertheless, 'observing the observers' and focusing on the internal dynamics of the DFM project brought a new understanding of communication that fills a gap in the literature and can contribute to the co-production of knowledge in international projects.

Synthesis: Learning About Dried Fish

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This eclectic edited volume is the outcome of a project with transdisciplinary co-learning ambitions. A first idea for this work emerged from a series of Dried Fish Matters Partnership transdisciplinary roundtables at the MARE 'People and the Sea' Conference in 2021. As we shared our experiences of learning about dried fish value chains, we were energized by the discussion of the various incomplete experiments, partial successes, and unanswered questions within our work, all of which signalled vitality in our research-in-progress. But we sensed regret that much of this exciting yet 'messy' work of exploring new categories of knowledge, as we were doing with dried fish, might never make its way into print. Indeed, failures tend to be obscured in academic publications – the false starts and dead ends being relegated to a sentence or two in a 'methodology' section, thence entering the black boxes of scientific knowledge. In an attempt to capture the excitement of the collaborative learning process, along with the evocative indeterminacy of the work-in-progress, our group agreed to prepare an experimental volume that could highlight the process – rather than the results – of our investigations into dried fish value chains.

Co-authored, co-edited, collaboratively reviewed, and transdisciplinary – in many ways this work fits the template of the scholarly edited volume. At

the same time, it embraces the unfinished and inconclusive: in our call for contributions, we invited authors to describe preliminary results, reflect on the research process, invite contemplation by readers, present field notes or raw data, or convey the original words and works of research participants or collaborators. It is also a work that, like the partnership from which it arises, aims to navigate the boundary between academic and practising communities. While some chapters are presented in a relatively familiar academic style, others more enthusiastically take up the invitation to work outside the boundaries of scholarly convention. The book includes photo-essays, recipes, stories, conversations, and even reflections by contributing researchers on their own taste for dried fish. Many of these contributions might be viewed as an intermediate stage of scholarship – more refined than fieldnotes, less so than a journal article – or as *essays* in the original sense of the unfinished, imperfect ‘attempt’ at addressing a subject, akin to the musical or artistic study or *étude*.

Initial anthropological concerns and interests

Our idea that dried fish *matters*, as an object of investigation for the social sciences and humanities, precedes and underpins this work. As dried fish is accessible due to its low cost and ready divisibility into small portions, it readily meets the nutrition needs of the most vulnerable people in our region of study. Dried fish products are often of great cultural significance, underpinning entire cuisines and acting as markers of identity. And dried fish value chains provide market income, especially to the poorest groups. At the same time, marginalization of these people – and exclusion from policy and scholarship – establishes a context for urgent scholarship. At the inception of our project, we found little research addressing the forms of value that are of strongest interest to us. We therefore proposed to examine how value is created in the dried fish economy at all stages of activity – from production through processing, exchange, and consumption – using the idea of the *value chain* as a framework for understanding human economic activity in the context of social, ecological, cultural, historical, political, and other forces.

From this perspective, we have investigated themes such as the history or evolution of the dried fish economy, gender and divisions of labour in the dried fish sector, the place of dried fish within household dietary preferences, or the ecological impacts of dried fish production.

We might suggest several reasons for the limited attention, within the research and policy literature on dried fish, to the forms of value that we have discussed in this volume. First, the nutritional and livelihood value of traditional foods such as dried fish may be overlooked due to their association with social marginalization. Second, the cultural value of dried fish is less visible within scientific research given knowledge hierarchies that privilege technical knowledge over interpretive insights from the humanities. And third, conventional economic models offer limited space for social and cultural factors in analyzing dried fish value chains or developing policy. Several of the disciplines with which we affiliate – anthropology, human geography, gender studies – are oriented by the goal of challenging such perspectives (see Chapter 25), and therefore provide a useful theoretical grounding for our present work. In looking at dried fish through the lens of the social sciences and humanities, and Arjun Appadurai (1986) in particular, we draw focus to the social life of dried fish, instead of dried fish as a material product. In this book, *dried fish* thus often stands in for gender relations, class relations, commensality, and other forms of social relationships that operate around dried fish.

The book clearly demonstrates the diversity of the dried fish sector in South and Southeast Asia. Some variations in fish preparation technologies are related to geography (Chapter 1), as practices such as sun-drying and fermentation require specific temperature and humidity ranges to avoid spoilage of the fish. Other variations relate to differences in cultural practices. This book has described a wide range of fish species and dried fish products, including:

- Maldivian fish, a traditional form of cured tuna processed by cutting, boiling, smoking, then sun-drying the fish, produced in Sri Lanka and parts of India (Chapters 3 and 15);

- large and small dried fish, cut or whole, processed on boats or on beaches, sometimes sold fresh and processed by large-scale actors, or dried from cultured fish such as tilapia and carp at the side of reservoirs in Sri Lanka (Chapter 17);
- kapi, a fermented paste made from krill or shrimp, used in Thailand as an ingredient in many dishes and condiments (Chapters 4 and 19), and the similar nga-pi fish or shrimp paste produced in Myanmar, as well as pickled fish and shrimp consumed as a side dish (Chapter 21);
- dried fish of multiple species sold in bulk or prepackaged at market vendors in Thailand (Chapter 19);
- dried ribbonfish, Bombay duck, anchovies, and prawns produced by seasonal labourers in the Sundarbans (Chapter 6);
- seer fish, anchovies, and prawns sold fresh or dried by women from fishing communities in Andhra Pradesh (Chapters 11 and 20);
- chapa or shidol, fermented freshwater barbs or anchovies prepared in Bangladesh and neighbouring parts of India, partly sun-dried then fermented in oiled, half-buried clay pots (Chapters 16 and 18);
- a single fish merchant who buys more than a dozen species of dried fish purchased from a wholesale market in Northeast India, including a large proportion of small indigenous fish species such as Moa and Puthi (Chapter 18); and
- salted and dried snakehead, a popular fish in Myanmar, consumed alongside smoked small indigenous species of freshwater fish (Chapter 21).

Through recipes, our contributors also hint at the varied ways that dried fish is consumed, and relished, as part of local cuisines. For example, kapi krill paste is a major ingredient in spicy and sour soup and in the condiment *nam prik kapi* or Thai chili paste (Chapter 4); dried queenfish, tuna, or other species are part of South Asian curries (Chapters 7 and 10), or prepared by pan-frying or roasting (Chapter 10); and deep fried, grilled, or curried dried snakehead is common in Myanmar (Chapter 21).

Definitional issues

Taken as a whole, the research efforts communicated in this volume can be interpreted as an attempt to define *dried fish* as a conceptual and theoretical category. From the perspective of anthropological political economy, dried fish represents an inviting point of connection to the small-scale producer whose precarious subsistence – and moral economy – are threatened by development processes informed by class interests. For the food scientist, dried fish represents a form of food that is nutritious, inexpensive, and available, but often neglected in food and nutrition security discourse. From both of these perspectives, dried fish is a food that represents unrecognized forms of value which academic research can publicize and legitimize. Our work of describing *dried fish* as a definitional category is, in this context, a conscious effort to construct value, mirroring the efforts described in our essay on the incorporation of raestur fiskur into sustainability and gastronomy discourses (Chapter 27).

The features we have associated with dried fish are shaped by its materiality as a dehydrated fish product, but just as importantly by its social and cultural role. In navigating the published scholarly literature on dried fish (Chapter 30), we felt justified in excluding from our working definition a number of industrial food products that were, quite literally, dried fish but removed from the social context of traditional food practices in South and Southeast Asia. We felt safe in ignoring products such as canned fish, fish roe powder emulsions, and modern engineered fish snacks, but perhaps not powdered food supplements that incorporate dried fish, which are designed to meet the nutritional needs of the world's poor. We also paid limited attention to technological innovations aiming to process dried fish products at scale, but took note of the widespread research and development investment in 'improved' solar dryers and drying racks intended for small-scale food processors, designed to enhance the quality and safety of dried fish products.

Our definitional work has thus largely been shaped by the commitment to studying not dried fish itself, as a physical product, but the practices and relationships associated with the making, trading, and eating of dried fish

in a specific part of the world. This perspective may help to explain why we include, as part of the *dried fish* conceptual category, some traditionally processed fish products that are not in fact dehydrated, such as fish sauces and fish pastes. As described in several chapters in this book, we find that fish is commonly fermented in the preparation of foods such as prahok (fermented mudfish paste from Cambodia), shukti (fermented hidol from Bangladesh) or kapi (shrimp paste from Thailand). We also see widespread use of cold-smoking, brine pickling, and dry salt-curing of fish as forms of preservation that involve only partial dehydration. The category of foods represented by this volume might more comprehensively be called ‘dried, cured, and fermented fish’ or ‘traditionally processed fish’, though either of those labels can encompass processing methods that involve cooking the fish. Having settled on the term ‘dried fish’, we propose the following working definition: “*aquatic animals preserved using simple techniques, such as sun-drying, salting, fermentation, and smoking that permit storage as foods at ambient temperature for extended periods without specialized packaging*” (Belton et al. 2022).

Co-learning

This book was partly conceived as an experiment in co-learning, as suggested to us by the experience of Too Big to Ignore (TBTI). *Co-learning* is a term used by TBTI as part of the ‘transdisciplinary (TD) co-production’ framework, defined by Polk (2015) as a form of problem-based learning that includes both practitioners and researchers throughout the knowledge generation process.³⁸ In governance settings such as urban planning and design, the term has been used to describe egalitarian problem-solving process across heterogeneous/asymmetric stakeholder groups (Light & Seravalli 2019). In formal education settings, co-learning has been used to describe forms of shared classroom learning that involve activities such as joint reflection and discussion on texts in a seminar (Heron et al. 2006), collaborative or group learning among classmates (Cuesta et al. 2016), or experiential learning

in the community (VanWynsberghe & Andruske 2007). In an Indigenous research context, co-learning may refer to aspects of reconciliation or ‘two-eyed seeing’, whereby Indigenous and non-Indigenous ways of knowing are brought together (Bartlett et al. 2012). In social network settings, co-learning may be a form of informal knowledge exchange and creation within a community forum (Aramo-Immonen et al. 2015). Finally, in the field of discourse, co-learning may represent a synthesis or dialogue between different narratives (Luederitz et al. 2017). While these uses of the co-learning concept are highly varied, they are all connected by their focus on a learning process that is social and interactive, rather than being located within the individual learner. In all of these settings, the learning is driven by a shared purpose – defining a problem or identifying solutions, understanding one another, or achieving consensus or compromise. Participants in the learning process form a heterogeneous group rather than a collectivity with a common identity; each participant comes to the co-learning setting with their own goals, knowledge, skill levels, and approaches. As a result, the setting accommodates social interactions in which participants have something they want to learn from others, but also have information and perspectives to share with the rest of the group.

This book is the product of several interconnected co-learning processes, including an overarching effort to demystify the learning process at work in our own project on dried fish. The SSHRC Partnership Grants scheme, which has funded this work, is intended to foster mutual co-operation, sharing of intellectual leadership, and the formalization of partnerships in which collaborative learning can occur across different institutions. Within this

³⁸ Earlier initiatives in small-scale fisheries governance have made similar use of the idea of ‘co-learning’. The Small-Scale Fisheries Academy describes itself, for example, as “*a secure place for co-learning and co-production of knowledge for wellbeing in the sector, protection of marine biodiversity and better governance*” (Nauen & Arraes Treffner 2021; Mundus Maris 2017). Similarly, the OctoPINTS project on sustainability and resilience in small-scale fisheries has a stated objective of supporting “*co-learning between researchers (based in Sweden and East Africa), stakeholders and fishery managers through the exchange and production of multiple knowledge types*” in a policymaking context (Lindkvist 2019).

framework we have created several spaces of co-learning that are outlined in various chapters in the ‘co-learning’ section of this book: co-authorship of a literature review among researchers from different disciplinary backgrounds (Chapter 30); learning how to use visual storyboards in authoring a video presentation on dried fish stories (Chapter 29); coming together during the COVID-19 pandemic to share stories about the tastes and smells of dried fish (Chapter 28); and working reflexively in project planning meetings to find better ways of receiving and communicating information, as a project management goal. Less explicit, but fundamental to this volume as a whole, were the forms of collaboration that informed the writing of individual chapters. Twenty-six of the chapters in this volume are multi-authored, while the remaining chapters also reflect co-learning processes as attempts to synthesize groups of chapters, analyze information prepared by project research teams, or suggest novel research approaches in conversation with other authors.

The collective editorial work that followed each set of manuscript submissions has also provided an important space for co-learning. The first thing that some of us learned was how much people really like dried fish in South and Southeast Asia. Although most of us grew up in countries where dried fish was a common part of the diet, we found that dried fish is of broader importance than we had assumed, and by interacting with the authors of different chapters we were able to encourage different themes to arise. In writing the chapter on dried fish value chains in Sri Lanka (Chapter 17), for example, Madu Galappaththi mentions that she realized she was entering into new conversations on well-being, a theme that had not come across strongly in her previous work. But we were also surprised to learn how much exploitation occurs in the processing segments of dried fish value chains in this same region.

The e-book format, embraced as a polyvocal work that avoids the ‘gatekeeping’ of scholarly apparatus, has allowed new voices to be heard – including those of students, practitioners, and researchers from the Global South, but also those who make a living from dried fish. The section ‘Food, life, and stories’ includes stories from dried fish processors and vendors, an artist and

a poet, and recipes shared from the families of researchers themselves. As one of our editors commented, this project has demonstrated that research can be playful, creative, and fun. It has provided an opportunity for people to provide their own ideas about why dried fish matters, and to talk about it in their own ways. We did not anticipate when DFM started that the passion expressed by so many consumers for the taste of dried fish would be mirrored in the enthusiasm for the topic by participants in the project.

Concepts and theories

We began our research with an anthropological perspective on dried fish economy inspired by the ‘diverse economies’ approach in economic geography (Gibson-Graham 2006; Roelvink et al. 2015), value theory in anthropology (Graeber 2001), the political ecology of natural resource governance (Nayak & Berkes 2010; Johnson 2014; Nayak et al. 2016), critical feminist studies (Dunaway 2013), and social wellbeing from international development studies (Gough & McGregor 2007). Together, these approaches encourage us to reconsider the metaphor of a *value chain* as a unidirectional set of links, instead acknowledging the multilinear and contingent nature of economic relationships related to dried fish. A more apt metaphor for the interactions we observe in a given site might be the *assemblage* in the anthropological sense – an open-ended gathering of people, things, stories, ways of being, in a particular place, which fosters patterns of unintentional coordination (Tsing 2015). But the idea of a ‘chain’ remains apt, as dried fish channels spatial and temporal interconnections between the distinct assemblages that exist at beaches, drying yards, markets, and homes.

The contributors to this volume have proposed various new analogies to describe the work surrounding dried fish. Pradhan, Nayak, and Armitage (Chapter 24) use the logic of the *social-ecological system* (SES) from resilience theory in their model of dried fish value chains, aiming to integrate ecological concerns into economic modelling by foregrounding the social-ecological dynamics of fisheries, as a resource system, within dried fish production and considering their impacts on downstream actors. Rahman (Chapter

25) argues for a socio-cultural framing of *value* that extends beyond the neoclassical economic model of utility and individual preference. Economic anthropology theories encourage us to consider not only the monetary value or utility of dried fish as commodity, but also the meaning generated from the context in which it is produced, exchanged, or gifted (Chapter 1). Fishing, as a way of life, may be deeply important to the identities of individuals and communities, rather than as a source of income. Similarly, individual fish products are direct markers of collective identity – such as hilsha in Bangladesh, the post-independence ‘national fish’.

The deliberate construction of symbolic value is the focus of Thrift’s contribution on *ræstur fiskur* (Chapter 27). This essay looks to the Faroe Islands for an example of how dried and fermented fish may be positioned as *sustainable gastronomy* through association with discourse on haute cuisine, terroir, and the UN Sustainable Gastronomy Day. As a counterexample to evidence that dried fish may be viewed as ‘poor people’s food’ in parts of Asia, we see the value of local, traditionally processed fish celebrated through incorporation of that product into new gastronomic contexts that index quality and sustainability.

Jyotishi and colleagues (Chapter 26) look at value in an economic sense, by exploring the ways that dried fish prices are presented in Karnataka wholesale and retail markets. Sale of fish in baskets and heaps, rather than by the kilogram, offers a less precise form of measurement but allows sellers more room to negotiate a fair rate of return. Whereas weight-based measures facilitate price comparison across vendors, such comparisons may be misleading – and could disadvantage processors – as the fish quality, moisture content, and processing costs are not uniform across vendors. The deliberate ‘obfuscation’ of prices in some market contexts, through reliance on traditional measures, reinserts the value into a negotiated context in which the seller has greater power, and may in fact earn nearly three times more than through standardized measures.

These theorizations have bearing on a core objective of DFM to map the social economy of dried fish in South and Southeast Asia. Consistent with the project’s approach to the value of dried fish, the idea of social economy sees

economic relations as context-specific in which behaviour reflects norms and histories of social interaction and experience. As the reflections above show, the project's mapping ambition is no mean task. How to convey the density of social-ecological assemblages of dried fish that are arrayed irregularly across space and connected in varying and changeable ways? This ebook, as an experimental moment in the project, offers some indications of what mapping might entail in terms of content and technique.

Mapping may be about tracing flows diagrammatically, geographically, or visually (Chapter 15; Chapter 16) in ways that reflect vertical value chain logics. Mapping, however, may also be more evocative, in textual (Chapter 28) or visual efforts to convey the density of meaning and lived experience of dried fish (Chapter 29). A central challenge for DFM in the remaining years of the project is to build on these lessons to explore more ways to map dried fish social economies while also continuing to develop strategies for creating big picture views of the entire assemblage of South and Southeast Asia's social economy of dried fish.

Conclusion

We began our work on this book with the conviction that dried fish matters, in particular ways that are not obvious to scholars and policymakers outside of our immediate circle. We end off the writing process with a renewed affirmation of this value, and a better understanding of ways to surface that values to those beyond our communities of origin. Our attention was drawn to the various types of *disvalue* in the dried fish sector, as well as to major transformations to value chains – such as the shift to e-commerce (Chapter 25) – that may be expected to change people's lives in fundamental ways.

The book was not originally planned in the design of the Dried Fish Matters project, but as an emergent initiative it succeeded at catalyzing genuine partnership in ways that surpassed our expectations. It also created a space for academic researchers, at the core of our network, to reinforce community connections. All chapters in this book were peer-reviewed by editors and other colleagues, yet we deliberately framed this process as one

of knowledge sharing – and co-learning – rather than evaluation of merit. As we encouraged the inclusion of ‘raw’ field notes, stories, transcripts, and images, the finished work presents a collection of disparate pieces, a great number of which draw on visual forms of representation, which we have assembled into the three main themes of ‘food, life, and stories’, ‘describing dried fish value chains’, and ‘co-learning’. While our brief synthesis chapters draw attention to the interconnections between the pieces in each of these sections, we hope this book will inspire readers to reflect on how our stories, recipes, essays, and photographs about dried fish fit together in other ways, encouraging us all to think further about the value and challenges present in dried fish value chains – and why, fundamentally, *dried fish matters*.

References

- Appadurai, Arjun, ed. 1986. *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge: Cambridge University Press. Aramo-Immonen, Heli, Jari Jussila, and Jukka Huhtamäki. 2015. “Exploring Co-Learning Behavior of Conference Participants with Visual Network Analysis of Twitter Data.” *Computers in Human Behavior, Computing for Human Learning, Behaviour and Collaboration in the Social and Mobile Networks Era*, 51 (October): 1154–62. <https://doi.org/10.1016/j.chb.2015.02.033>.
- Bartlett, Cheryl, Murdena Marshall, and Albert Marshall. 2012. “Two-Eyed Seeing and Other Lessons Learned within a Co-Learning Journey of Bringing Together Indigenous and Mainstream Knowledges and Ways of Knowing.” *Journal of Environmental Studies and Sciences* 2 (4): 331–40.
- Cuesta, Marta, Monica Eklund, Ingegerd Rydin, and Ann-Katrin Witt. 2016. “Using Facebook as a Co-Learning Community in Higher Education.” *Learning, Media and Technology* 41 (1): 55–72. <https://doi.org/10.1080/17439884.2015.1064952>.
- Dunaway, Wilma A. 2013. *Gendered Commodity Chains: Seeing Women’s Work*

and Households in Global Production. Stanford University Press.

Gibson-Graham, J. K. 2006. *The End of Capitalism (as We Knew It): A Feminist Critique of Political Economy*. University of Minnesota Press.

Gough, Ian, and J. Allister McGregor. 2007. *Wellbeing in Developing Countries: From Theory to Research*. Cambridge University Press.

Graeber, David. 2001. *Toward an Anthropological Theory of Value: The False Coin of Our Own Dreams*. Springer.

Heron, Richard Le, Richard Baker, and Lindsey Mcewen. 2006. "Co-Learning: Re-Linking Research and Teaching in Geography." *Journal of Geography in Higher Education* 30 (1): 77–87. <https://doi.org/10.1080/3098260500499659>.

Johnson, Derek. 2014. "A Political Ecology of Legal Plural Disconnection in the Marine Fishery of Junagadh District, Gujarat, India." In *Conflict, Negotiations and Natural Resource Management*, 128–47. Routledge.

Light, Ann, and Anna Seravalli. 2019. "The Breakdown of the Municipality as Caring Platform: Lessons for Co-Design and Co-Learning in the Age of Platform Capitalism." *CoDesign* 15 (3): 192–211. <https://doi.org/10.1080/15710882.2019.1631354>.

Lindkvist, Emilie. 2019. "OctoPINTS: Octopus & People In Novel Transdisciplinary Simulations: Investigating Sustainability and Resilience of Small-Scale Fisheries Interventions." *OctoPINTS* (blog). February 9, 2019. <https://octopints.wordpress.com/cases-methods/>.

Luederitz, Christopher, David J. Abson, René Audet, and Daniel J. Lang. 2017. "Many Pathways toward Sustainability: Not Conflict but Co-Learning between Transition Narratives." *Sustainability Science* 12 (3): 393–407.

<https://doi.org/10.1007/s11625-016-0414-0>.

Mundus Maris. 2017. "An Academy for Small-Scale Fisheries." 2017. <https://www.mundusmaris.org/index.php/en/projects/2017/1684-academy-en>.

Nauen, Cornelia E., and Maria Fernanda Arraes Treffner. 2021. "Translating SSF Guidelines Into Practice With the Small-Scale Fisheries Academy." *Frontiers in Marine Science* 8. <https://www.frontiersin.org/articles/10.3389/fmars.2021.730396>.

Nayak, Prateep Kumar, Derek Armitage, and Mark Andrachuk. 2016. "Power and Politics of Social–Ecological Regime Shifts in the Chilika Lagoon, India and Tam Giang Lagoon, Vietnam." *Regional Environmental Change* 16: 325–39.

Nayak, Prateep Kumar, and Fikret Berkes. 2010. "Whose Marginalisation? Politics around Environmental Injustices in India's Chilika Lagoon." *Local Environment* 15 (6): 553–67.

Polk, Merritt. 2015. "Transdisciplinary Co-Production: Designing and Testing a Transdisciplinary Research Framework for Societal Problem Solving." *Futures*, "Advances in transdisciplinarity 2004-2014," 65 (January): 110–22. <https://doi.org/10.1016/j.futures.2014.11.001>.

Roelvink, Gerda, Kevin St Martin, and Julie Katherine Gibson-Graham. 2015. *Making Other Worlds Possible: Performing Diverse Economies*. U of Minnesota Press.

Tsing, Anna Lowenhaupt. 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press.

VanWynsberghe, Rob, and Cynthia Lee Andruske. 2007. "Research in the Service of Co-Learning: Sustainability and Community Engagement."

DRIED FISH MATTERS

Canadian Journal of Education 30 (1): 349–76.

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Nova Almine is a master's student at Memorial University, Canada, studying small-scale fisheries and dried fish in Thailand. Growing up in the Philippines, where dried fish is a typical food and income source, she felt that dried fish in the global context is overlooked in research and policy and thus deserves attention. Now, she finds Newfoundland as her new home where she and her good friend and colleague, Lillian Saul, co-founded a social enterprise to help local fishers connect directly to consumers in marketing their fish. She enjoys SCUBA diving and volunteering and hiking the east coast trail.



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Dr. Mostafa Ali Reza Hossain – or Ranu, as he was known to many friends – was professor in the Department of Aquaculture at Bangladesh Agricultural University. He served 2 years as the Head of the Department of Fisheries Biology and Genetics. Mostafa was one of the foremost experts on freshwater fish taxonomy in Bangladesh. He established a Fish Museum and Biodiversity Center on the BAU campus. Mostafa was a central member of the Dried Fish Matters project. His early research on dried fish value chains in Bangladesh with colleagues from WorldFish provided much of the initial inspiration for the DFM project proposal. He was a cornerstone of the DFM Bangladesh country team, as well as a regular and active participant in DFM global, where he was a source of encouragement for many members of the wider project team. A heart attack tragically cut short Mostafa’s life on January 29, 2023.



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Md Mahfuzar Rahman

Md Mahfuzar Rahman is a socio-cultural anthropologist currently pursuing a PhD in the Department of Anthropology at the University of Manitoba. His PhD study titled Values, rights, wellbeing and the social economy of dried fish in Bangladesh adopts an inclusive and critical value chain approach that derives insights from social wellbeing, the diverse economic perspective, value theory in anthropology and a critical human rights perspective. It examines the multidimensional (dis)values produced in dried fish value chains and their impacts on the products, working conditions and people associated with them. Mr. Rahman's areas of interest encompass socio-cultural anthropology, political economy, social justice, human and child rights, and diverse economies.



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Prasanna Surathkal works as a Research Associate at the Azim Premji Foundation, Bengaluru, India. He is academically trained in fisheries science and agricultural economics. His research interests include applied econometrics and value chain analysis.



Parag Tandel

Parag is a visual auto-ethnographer who archives what he perceives around him and his relationship with the scenery he inhabits. His visual art and socially engaged art practices are raising issues of loss and identity. He is archiving prevailing circumstances and intervening in the oral narratives regarding the colonial and imperial history of the fisherfolk of Mumbai. Tandel earned a Diploma in Creative Sculpture from M. S University, Baroda (2005) after completing a Diploma in sculpture and modeling from Sir J.J. School of Art, Mumbai (2003). Tandel's solo exhibitions include Chronicle at TARQ, Mumbai (2016) and Autopolisphilia curated by Noopur Desai at Sudarshan art gallery, Pune, India (2018) as well as Pregnant Room 1 and Pregnant Room 2, both showcased at Pundole Art Gallery, Mumbai (2008 & 2010). His artist book, Ek bagal mein chand hoga ek bagal mein rotian was published in 2022 by TARQ with support from Mumbai Water Narratives at the Living Waters Museum.



Shakuntala Haraksingh Thilsted

Shakuntala Haraksingh Thilsted is a specialist in nutrition-sensitive approaches to aquatic food systems. She is a dual national of Trinidad and Tobago and Denmark. It was announced on 11 May 2021 that she was the winner of the 2021 World Food Prize, the first woman of Asian ancestry to be awarded the prize.



Eric Thrift

Eric Thrift is a socio-cultural anthropologist whose interests include environmental governance, social-ecological resilience, and the role of culture in development. His ongoing research addresses mobile resource users' ability to accommodate social and ecological change and uncertainty in Mongolia. As Principal Investigator of the SSHRC-funded project 'Untangling the ethics of 'sustainable' cashmere', Eric is currently working with Mongolian partners and stakeholders to investigate how diverse understandings of ethics and sustainability come into conflict in the global commodity chain for cashmere. Eric has a strong interest in promoting collaborative ethnographic research in applied settings, aiming to support discussions on the importance of culture in sustainable development policy and practice.



Suphakarn Traesupap

Suphakarn Traesupap is currently senior research fellow at the TBTI Global Foundation. She received a BSc (Fisheries management) from Kasetsart University, Master of Fisheries Science from Kagoshima University and PhD in Marine Science from Kagoshima University, Japan. She held a lecturer position at Kagoshima University, Japan, teaching a class about fisheries in Southeast Asia countries. Her past research focused on marine ranching fisheries for Japanese fisheries cooperatives and the international trade of marine products, particularly shrimp. Suphakarn also conducted research on the impact of shrimp farming on mangroves in Thailand. After relocating back to her hometown, Thailand, she worked with the Coastal Development Center (CDC) Kasetsart University as Senior Research Fellow for 3 years. Then she worked with Thai Union Feed Mill as Procurement Manager until 2018.



Chathurika Hiroshini Wedige

Ms. Chathurika Hiroshini Wedige is an Instructor and the Coordinator of the National Diploma Program in Aquaculture & Aquatic Resources Management at the Ocean University of Sri Lanka, Panadura Regional Centre. Chathurika holds a Master's degree in Fisheries and Aquatic Resources Management from the University of Sri Jayawardhanapura, Sri Lanka. She led and coordinated community-level data collection activities in Western Sri Lanka during Madu Galappaththi's doctoral research.



Nireka Weeratunge

Nireka Weeratunge is an anthropologist and Research Fellow at the International Centre for Ethnic Studies (ICES) in Colombo. She supports the DFM Sri Lankan team on qualitative research methods and gender analysis. She has a PhD in anthropology from the University of Toronto, Canada with over 30 years of research and practice in the interface of gender, environment and development issues in the Asia-Pacific region. Her main areas of work are the social and cultural aspects of natural resource use, focusing on livelihood strategies in relation to poverty, vulnerability, resilience and wellbeing in fishing and farming communities.



Ishara S. Weththasingha

Mr. Ishara S. Weththasingha is a student in the Diploma Program in Aquaculture & Aquatic Resources Management at the Ocean University of Sri Lanka, Panadura Regional Centre. Ishara was a member of the field research team during Madu Galappaththi's doctoral research in Sri Lanka.



Sachindu S. Weththasingha

Mr. Sachindu S. Weththasingha is a student in the Diploma Program in Aquaculture & Aquatic Resources Management at the Ocean University of Sri Lanka, Panadura Regional Centre. Sachindu was a member of the field research team during Madu Galappaththi's doctoral research in Sri Lanka.



Shalika Laksan Wickrama

Shalika Laksan Wickrama is a researcher and entrepreneur employed in more than four agricultural business-related companies in Sri Lanka. He completed his first degree in BSc in Agricultural Business Management at the University of Ruhuna. He will complete two Masters degrees under Dried Fish Matters project in 2023, including MSc in Organizational Management at the University of Peradeniya) and MPhil in Agriculture Economics at the University of Ruhuna. Mr. Wickrama has completed several professional diploma courses related to human resource management, applied statistics, computer studies, and other fields. He is interested in research related to fisheries economics, value chain analysis, and agricultural economics and has more than 20 research publications related to these fields.



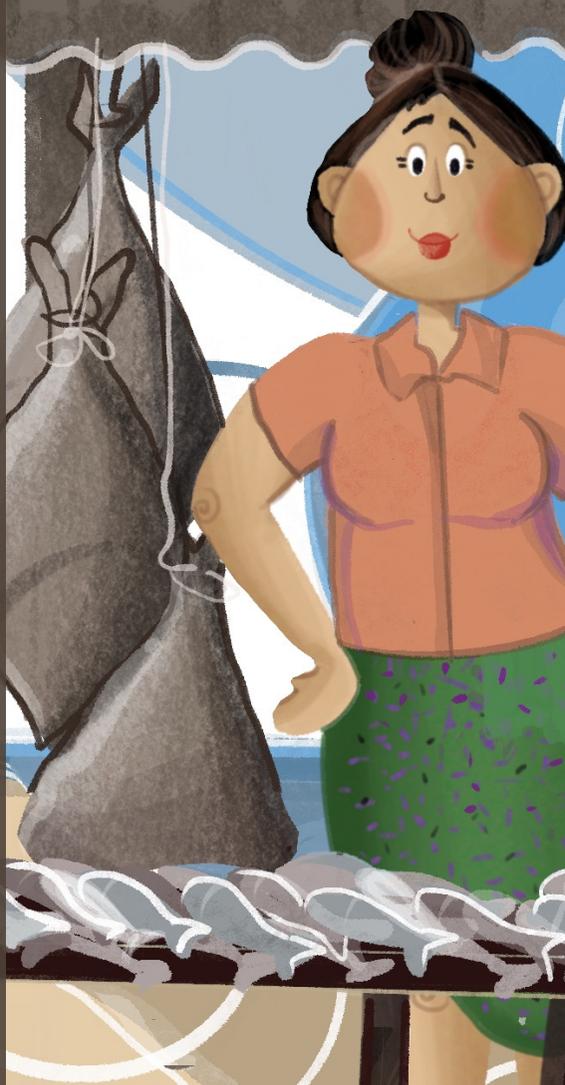
Thamasak Yeemin

Thamasak Yeemin has worked at the Marine Biodiversity Research Group, Department of Biology, Faculty of Science, Ramkhamhaeng University, in Bangkok since 1992. His education background includes a DSc in Biology from Kyushu University, Japan. His experience covers many aspects of coastal and marine ecosystems, including management, conservation, research, and administration, based on over 30 years of fieldwork in Thailand and other parts of the Western Pacific. He has worked as a consultant for several regional collaborative projects under international organizations. He is currently a president of the Marine Science Association of Thailand (MSAT).

Dried and fermented fish is of vital nutritional, economic, social, and cultural importance to the people of South and Southeast Asia. Despite this, the diverse and complex economy that produces and distributes dried fish is nearly invisible in research and policy. The Dried Fish Matters Partnership brings together a network of interdisciplinary research teams in six countries to address this major oversight.

This volume, consisting of essays, recipes, stories, and reflections contributed by members of our research partnership, provides a commentary on why dried fish matters – to us as researchers, to the communities in which dried fish is produced and consumed, and to the gastronomic heritage of humanity. The book celebrates the cultural value of dried fish as food, alongside its social and economic value for development and sustainability.

The chapters in this book describe and analyze dried fish products and value chains, share the stories and experiences of people who produce and sell dried fish, and reflect efforts to find new ways to learn and to communicate knowledge about dried fish.



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