

IMBeR West Pacific Symposium 2021

Session 3: Dried Small Fish: Ecology, Value Chains and Nutrition

November 25, 2021

Session Introduction

This session is a first of its kind on dried small marine pelagic fish, and included a keynote address, twelve oral presentations, and a stimulating discussion. Oral presentations were categorized into three geographical regions — East Asia, Southeast Asia, and South Asia - and across the Pacific and Indian oceans for a cross-fertilization of knowledge across several disciplines. Under each region, the presentations focused on the themes of ecology, value chains, and nutrition.

Co-moderators: Nireka Weeratunge and Derek Johnson

Rapporteur: Madu Galappaththi

Number of participants: 56

Major highlights from each presentation

Keynote: Dr. Shakuntala Haraksingh Thilsted, Winner of the World Food Prize 2021

- Aquatic food, including dried small fish, are ‘superfoods’ of rich nutritional content, which go far beyond their economic value.
- For nourishing the West Pacific through aquatic foods, we require transformations in food systems towards sustainability, nutrition, and equity; gender and poverty gaps in food insecurity have increased after COVID-19.
- To enable such transformations, we must recognize the crucial role that aquatic foods play; amplify investments in research and innovation across from households to global levels; and rethink the value of aquatic foods in nourishing, rather than merely feeding, populations by expanding focus beyond monetary values.
- Fundamental guiding principle in these efforts should be ‘diversity’ — food-wise, people-wise, benefit-wise, as well as solution-wise.

➤ EAST ASIA

Ecology:

Oral Presenter 1: Shuhao Liu

- Using the species distribution model, this study predicted that rising ocean temperatures in Japanese sea due to climate change will result in a northward

habitat shift and an increase in relative abundance of wintering Japanese anchovy (*Engraulis japonicus*).

Oral Presenter 2: Takeshi Tomiyama

- Central Seto Inland Sea is a Japanese region where larvae, juvenile, and adult anchovy comprise different popular dried fish products.
- Annual stock assessments in the fishing grounds in Central Seto inland sea shows location-specific dynamics in larvae and juvenile populations, and in egg abundance of Japanese anchovy.
- Although the impact of predation by Japanese Spanish mackerel (main predator) is low, prey availability for anchovy has decreased while leading to an abundance of lower quality anchovy eggs. Lower quality eggs, however, result in good quality dried anchovy due to low fatness of juveniles and adults.

➤ SOUTHEAST ASIA

Ecology

Oral Presenter 3: Alexanra Regalado

- A study of catch composition, seasonal variations, and critical habitats associated with lobo-lobo fishery in western Visayan Sea (The Philippines) demonstrates the need for gear regulation and habitat protection to ensure sustainability.
- The lobo-lobo fishery includes a variety of species of small fish, but also the juveniles of larger fish as well.

Value Chains

Oral Presenter 4: Nova Almine

- A scoping study of dried anchovy value chains in Thailand revealed critical research gaps in three areas: a) impact of changing fisheries regulations on the industry; b) raw material sources, trade flows, gendered labour, and emerging markets associated with different scales of production; and c) the vulnerabilities and coping strategies to ensure the survival of small-scale producers.

Oral Presenter 5: Ruby Napata

- Value chain functions and organization of dried sardine industry in the Philippines vary depending on the scale of production and seasonality, with significant contributions made by small-scale long-term producers.
- The strengths and challenges faced by the producers also vary across value chain nodes. Improving value chain performance thus calls for a variety of targeted interventions including policy changes, technology interventions, and capacity building programs inclusive of all actors.

Nutrition

Oral Presenter 6: Wae Win Khaing

- A household consumption survey in Myanmar shows the significance of dried fish in local diets emphasizing the product- and quantity-wise variations in consumption across sub-country regions.
- Subsistence consumption, cultural importance to different ethnic groups, and women's labour contributions towards sustaining processing activities, are among the key insights that emerge from this study.

DFM Synthesis – Southeast Asia

Oral Presenter 7: Ben Belton and Kyoko Kusakabe

- Available accounts of dried fish in Southeast Asia are patchy at best.
- Despite inter- and intra-country variations in products, processing practices, and consumption preferences, broad general tendencies exist across the Southeast Asian region.
- Dried fish remains deeply integrated into everyday rhythms, responds quickly to changes in demand, and is often perceived as a traditional sector, which is partly why the sector remains overlooked and marginalized.
- The sector therefore is surprisingly dynamic and persistent while showing obsolete characteristics at the same time.

➤ **SOUTH ASIA**

Ecology

Oral Presenter 8: Abilasha Sharma

- Climate change impact on small pelagic fish distribution (e.g., Indian oil sardine) along the Southwest coast of India has caused a shift northwards and into greater depths.
- Fishing gear changes creates drastic demand and price dynamics (e.g., bottom trawling lead to low value by catch destined for fish meal at a much lower price) with significant implications on the livelihoods and nutrition security of dried fish-dependent communities.
- Better understanding the impacts of climate change and other environmental factors, changes in resource utilization (e.g., gear use), and value chain dynamics is crucial for sustainably managing small pelagic fisheries in Indian waters.

Value chains

Oral Presenter 9: Tara Nair

- The sustainability of dried fish and artisanal fisheries in Kutch coast in Gujarat (India) continues to be threatened by government-supported coastal industrialization activities, depleting catch levels, and shrinking dried fish-based local economies among other challenges.

Oral Presenter 10: Shalika Wickrama

- A value stream analysis across dried Smoothbelly Sardinella value chain in Northwest coast of Sri Lanka shows inequitable profit distribution relative to the value each actor embeds in terms of their effort and time (e.g., processors who add the most value to the product earn the least profit margin compared to wholesalers and retailers).

Nutrition:

Oral Presenter 11: Sami Farook

- An analysis of Bangladesh's national consumption data over the past two decades shows an increasing gap in dried fish consumption between poor and non-poor income categories, suggesting that the poor are increasingly substituting dried fish with chicken and aquaculture-produced fish.
- Harnessing the potential benefits of dried fish therefore calls for nutrition-sensitive policy interventions that takes into consideration the product affordability, consumption patterns, as well as the changing consumer preferences.
- Dried fish also plays critical role towards food and nutrition security during natural disasters and economic shocks, particularly for the poor in Bangladesh.

DFM Synthesis – South Asia

Oral Presenter 12: Nikita Gopal

- Despite the economic, social, cultural, and nutritional importance of dried small fish to South Asia, the sector is threatened by multiple vulnerabilities related to catch variations, competition for coastal space, gendered labour issues, debt-tied sales arrangements, and policy blind spots among many other issues.
- Ecological changes directly impact the small pelagic fish availability and use.
- Processing technology improvements and interventions that meaningfully address the issues faced by women who sustain the processing node may help elevate the visibility of the sector.

Discussion:

- The widening gap in dried fish consumption between the poor and rich is a complex issue. Factors that contribute to this divide may include increasing prices, changes in taste preferences as well as the methods of preparation as dried fish often involve culinary knowledge and traditional recipes that may take more time and be perceived as less convenient.
- Understanding who has access to dried fish is crucial in ensuring food security and equity among income groups. For example, promoting value added products may make dried fish less accessible to the poor. Commercialization of value chains may also threaten the livelihoods of traditional small-scale producers.
- Dried fish price level increases might be a result of fish production/supply reaching the maximum capacity, for example, in the case of Bangladesh's marine production.

- Accuracy should be checked for the available small fish datasets because the data may have been underreported for small fish varieties compared to larger fish varieties (In Africa, large fish data shows more accuracy than the small fish data).
- A major concern related to the health of small fish stock levels is the juvenile catch. In addition to existing regulations in some places (e.g., banned mesh sizes, seasonal closures), regulating the demand for juvenile products at the market end may also be an avenue for reducing juvenile catches.
- Addressing the issue of small fish use for fishmeal seems a governance issue because a policy intervention like zero-tolerance on small fish use for non-human consumption purposes may mean increased discards at sea, which impact the overall supply of small fish. There is also a scale dimension to this issue as the fishing methods like trawling result in large by-catch levels compared to small catches from artisanal boats.

Overall summary of the session

The session brought together a keynote and a series of oral presentations, contributing new insights and a rich exchange towards addressing the large knowledge gaps that exist in the emerging area of dried small fish research. The insights gained from an ecological perspective show that small pelagic fish are declining and changing their patterns of movement, due to a complex mix of both human and environmental factors. There appear to be considerable gaps in the ecological knowledge of small pelagic fish in South and Southeast Asia, including impacts of climate change on the distribution of fish stocks.

From a value chain perspective, access to small pelagic fish is becoming a challenge for all actors, especially for the processors, with declining fish stocks and competing use as fishmeal. A picture of the inequities among actors within value chains emerges but there is a need for precise analyses, and the challenges posed for value chain governance. While knowledge on the value chains is increasing in both South and Southeast Asia, more research is needed in East Asia.

Under the nutrition and consumption theme, despite the high cultural value in consumption of dried small fish in many Asian countries, there is a lack of data on how consumption is distributed across income groups and regions, and how important it might be in economic and nutrition terms. Existing knowledge on patterns and preferences of dried fish consumption, with particular attention to the dependency of low income and vulnerable groups for their food and nutrition security, especially during natural disasters require critical attention across the three regions.

Overall, one of the important highlights from this session is that the decline and changes in the movement of small pelagic fish, as well as competing demands from the fishmeal industry, pose challenges for food security and nutrition, especially of the poor, as well as the continuity of livelihoods for small-scale fishers, processors, and traders across the West Pacific.

New IMBeR West Pacific Marine Biosphere Research projects/directions for the next three years from this session

- The links between ecology, value chains, and nutrition related to small pelagic fish should continue to be explored and recognized as a new knowledge frontier for collaborative research in the West Pacific, linking current initiatives in South and Southeast Asia with potential partners in East Asia.
- This area of research fits well within the IMBeR Innovation Challenge 4 towards improving the integration of natural and social science data for ocean governance.
- This research area also falls within the objectives of Grand Challenge II to develop alternative scenarios to bridge the gap between physical climate sciences and humanities, and Grand Challenge III on supporting sustainable, equitable and inclusive governance approaches to fisheries and aquaculture, as well as towards climate change adaptation and mitigation.