

TITLE OF ROUNDTABLE	Seafood in an uncertain future
DATES	9 – 12 December 2014
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FACULTY / DEPARTMENT	Fisheries Centre, Faculty of Science, UBC Graduate School of Public Policy, University of Tokyo
CO-SPONSOR(S) (if applicable)	Nippon Foundation-UBC Nereus Program

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Date: 9 – 13 December 2014
 Venue: Liu Institute for Global Issues

This Roundtable aims to address the following question: Do we have enough seafood to feed the world’s demand in the era of climate change? Over the course of four days from 9 to 12 Dec 2014, we brought together a team of interdisciplinary and cross-sectorial experts - natural and social scientists, government and non-government officers, journalists, and artists— to discuss and synthesize ideas pertaining to this question. Specifically, the Roundtable was designed to 1) advance the understanding of the multi-dimensional linkages between climate change and the world’s seafood production systems, 2) develop scenarios of the future of the ocean, highlighting the associated trade-offs for food security and societal resilience, including poverty reduction, human health, and cultural diversity of coastal communities, 3) explore adaptation and risk mitigation strategies and research priorities; and 4) develop innovative ideas for communicating the complexity of ocean-human interactions to policy makers and the general public.

Day 1. 9 Dec 2014

Introduction

After the warm welcome openings by Acting Director of the Peter Wall Institute, **Dr. Nancy Gallini** and Deputy Director of Liu Institute for Global issues, **Ms. Julie Wagemakers**, the Principal Investigators of the Roundtable gave an overview about the objectives and scope of this Roundtable, an introduction of the global environmental challenges to sustainable seafood, and the theoretical principle of scenario development and the joint-fact-finding processes that underpinned the design of the Roundtable.

Disciplinary discussion: creating concept maps

To generate a system-level (from biophysics to social and economics) understanding about challenges to future seafood sustainability, the participants were asked to create concept maps that addressed the question: *what are the key factors affecting seafood production?* The participants were first divided into three “disciplinary” groups (natural sciences, economics, governance) to generate domain-specific views on how different factors affect seafood production (Figure 1).



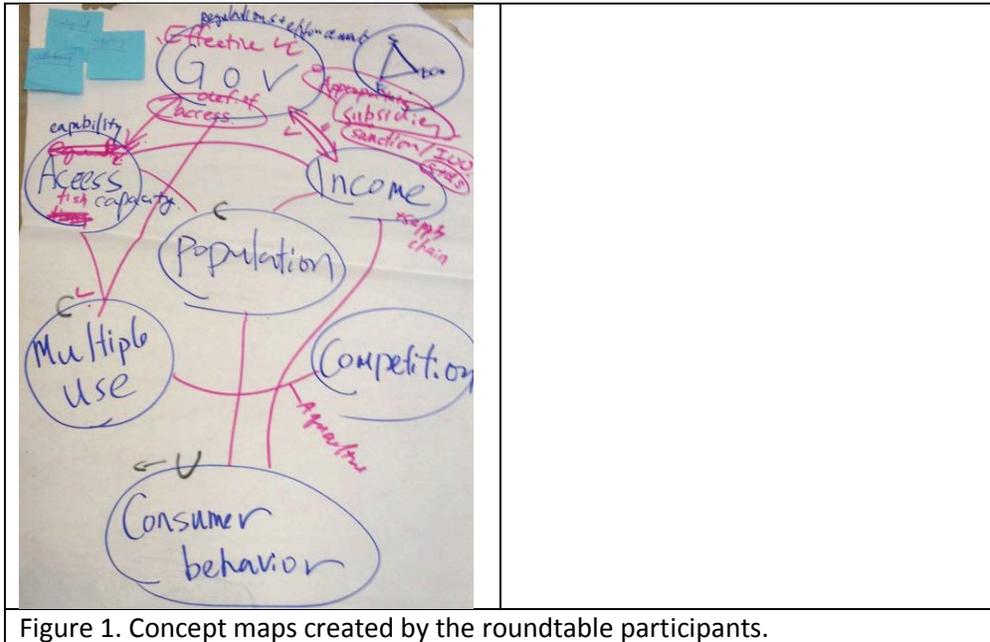


Figure 1. Concept maps created by the roundtable participants.

Interdisciplinary discussion on linkages

The disciplinary views were shared and discussed in a plenary session through which the participants were able to learn how experts from other disciplinary fields view the same questions and how these different views could link and relate to one another. This activity contributed to generating new systems-level perspectives about seafood sustainability.

Brainstorming of key certainties and uncertainties

Following this, participants from different disciplines were mixed together into three interdisciplinary groups to identify key “certainties” and “uncertainties” related to future seafood production. This is the first step in developing future scenarios of seafood sustainability. The groups were asked to use the systems-level understanding co-developed from the previous session.

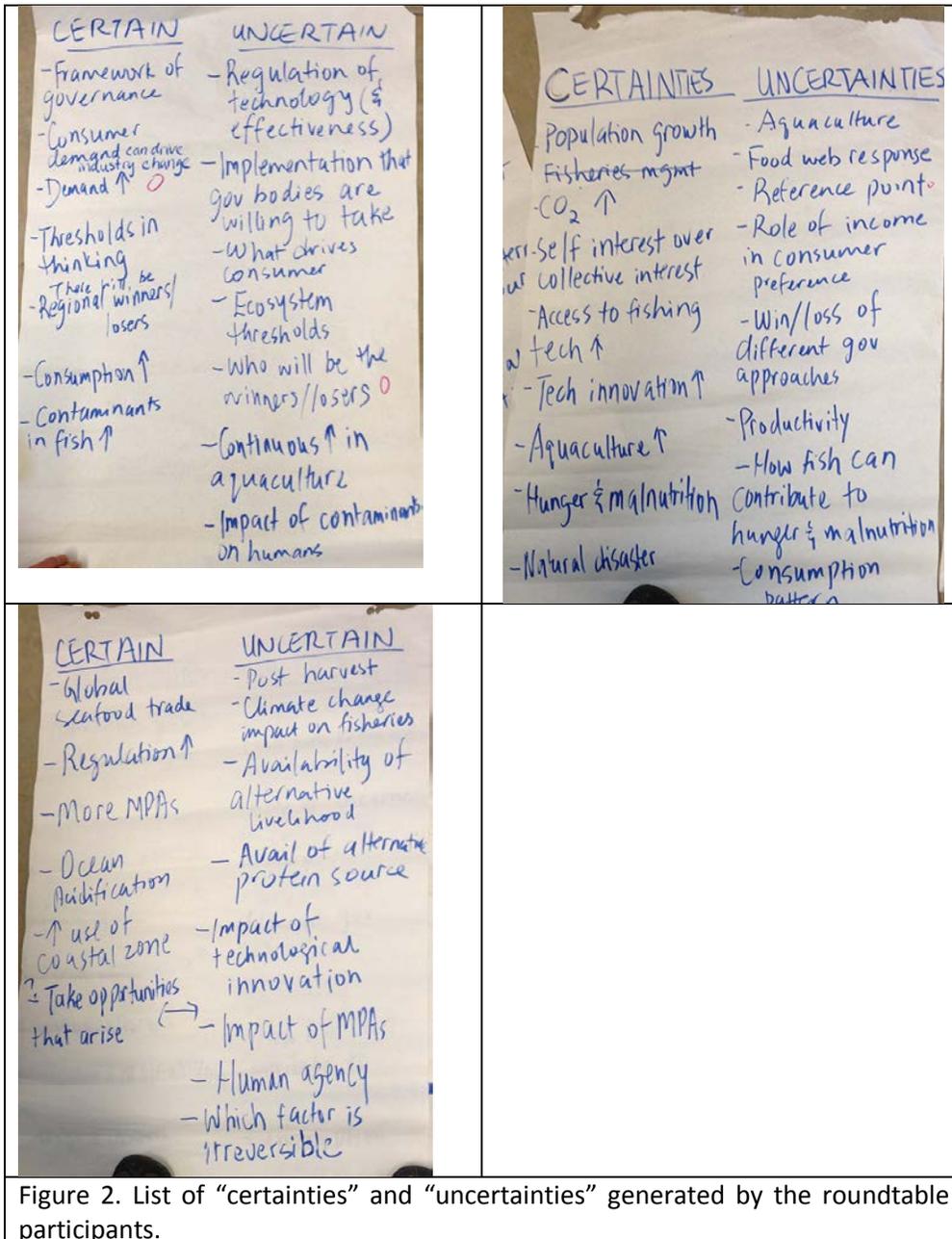


Figure 2. List of “certainties” and “uncertainties” generated by the roundtable participants.

Day 2. 10 Dec 2014

Selection of key uncertainties

Each group shared and discussed their views about the key “certainties” and “uncertainties” they had identified. At the end, these were combined into a list of key “axis” that would characterize the possible future of seafood sustainability (Figure 3.)

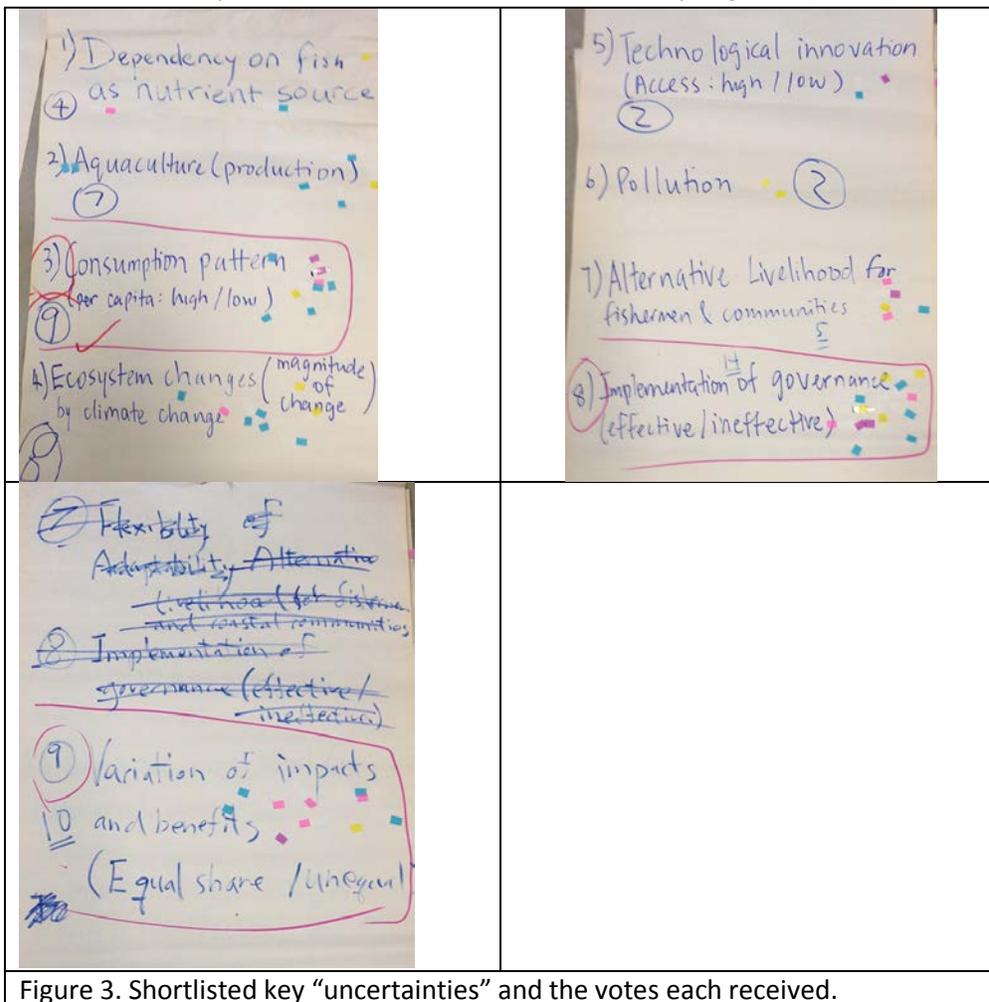


Figure 3. Shortlisted key “uncertainties” and the votes each received.

We asked the participants to vote on their choice of most important uncertainties determining the future of seafood sustainability. Each participant received three post-it stickers, each representing one vote. They were asked to post their vote on the list of factors and at the end, we identified the three most voted uncertainties as “axis” to define future scenarios. At the end,

the selected three uncertainties were: “consumption pattern”, “Implementation of governance” and “variation of impacts and benefits”.

Development of scenarios

Based on the three “uncertainties”, we discussed and agreed on three contrasting future:

Scenario group	Seafood demand	Governance	Variation of impacts/benefits
1	High	Low	High
2	Low	High	Low
3	High	High	High

The participants were split into 3 interdisciplinary groups and each group was tasked to develop the story line for each scenario.



A break during scenario-building group brainstorming sessions



Low Governance: A Fishy World: Scenario-building group brainstorming session. Wednesday, Dec. 10.

Visiting MOA

At the end of the day, the participants visited the Museum of Anthropology (MOA), with a guided tour kindly offered by **Dr. Jennifer Kramer**, a curator of MOA (Peter Wall Institute Early Career Scholar 2013-14). This visit reminded the participants about the need to consider local social and cultural context in developing large scale scenarios for seafood sustainability.

Day 3. 11 Dec 2014

Sharing of future scenarios

Each scenario group presented their view about future seafood sustainability. Highlights of the scenario stories include:

Scenario group 1 depicted a **“Fishy world”**, in which:

- The world relies more on market forces, driving fishing effort if and where they can.
- Investment in aquaculture development will increase, leading to expansion of aquaculture.
- There will be an increase in investment into seafood industries, however, the flows of benefits will go to consolidated firms or developed countries. Increased consumer demand for more sustainable food may lead to some positive changes, particularly in developed countries. There is opportunity for civil society and non-government actors to fill the vacuum of top-down governance.
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Scenario group 2 depicted a **“Healthy Ocean with a Big Bill”**:

- Globally, growth in demand for wild fish is tempered by transitions to alternative nutrition sources (including aquaculture and land-based protein sources), and/or relatively slow population growth.
- Transitions are driven by demographic and nutritional transitions in developing economies (w/ region specific trends, i.e., BRICs+), with attendant shifts in livelihoods, purchasing power, affluence and diets.
- Primary among seafood alternatives is the shift from primary reliance on wild fisheries for fish consumption to aquaculture in developed countries, driven by technological development (including feed improvements that do not rely on wild fish).
- Management to sustain long-term fisheries yield in service of food security and livelihoods.
- Massive investment in research, monitoring, enforcement and local, regional and multi-national coordination to achieve goals

Scenario group 3 depicted a world of “**Governance for fish**”:

- By 2050, world population will increase to 9 billion, expanding the market for fish by ~30%.
- Increasing affluence in developing countries will see diets become more ‘westernised’, i.e. with more animal protein
- Aquaculture is the fastest growing food system and depends on fishmeal
- Fish meal will remain an important ingredient of feeds for other animals
- Possible decrease in fish consumption in developed countries due to consumer preference for conserving wild fish
- Overshadowed by increased fish consumption in developing countries, where purchasing power is better suited to capture fishery products
- Weakening of present-day patterns where fish is generally exported from developing countries to developed nations.
- More wild fish will be retained by developing nations

Brown Bag presentations to explore some real-world situations related to scenarios

We invited three participants to present three case studies on issues related to current and future seafood sustainability that highlight different local context and the need to connect with them in exploring future scenarios.

- “Involving Local Fishing Communities in Marine Resource Management: Recent Work in Sabah, Malaysia”, by **Dr. Lydia Teh**
- “Coastal Livelihoods in the Republic of Madagascar: General Introduction” by **Ms. Vatosoa Rakotondrazafy**
- “Coastal fisheries of the Philippines in the face of natural disaster” by **Dr. Marivic Pajaro**

Public event: Laptop orchestra and digital art exhibition

The laptop orchestra was a collaboration between the Roundtable and School of Music (**Drs. Robert Pritchard, Keith Hamel and Hedy Law**). Specifically, led and directed by Bob and Keith, and coordinated by Hedy, two teams of UBC students in the laptop orchestra course composed two performances on the theme of the ocean. Their creation had been inspired by discussion about the topic with the PIs of the Roundtable. A section of the performance can be seen from: <https://youtu.be/Unf8q8A47XU>

In addition, an art exhibition composed of pieces produced as a science communication project for ocean literacy funded by the Nereus Program was held before the concert. The exhibition included selected original pieces by the American painter, **Ms. Jenn Paul Glaser**, each uniquely created from the artist’s conversations with researchers working in different ocean-related disciplines. Some of the art pieces were also used in the visual components of the laptop orchestra.



“Simulating the future oceans” by American artist Jenn Paul Glaser.

Final summary and discussion

For the final session, we discussed about key concepts that are important in defining storylines of future seafood sustainability. We explored non-verbal expression, with the help of the artist **Ms. Jean Paul Glaser**, in order to better communicate some of the complicated concepts between participants with different disciplinary backgrounds (Figure 4).





Figure 4. Artistic depiction on the definition of seafood demand, governance and variation of impacts.

The participants then had a summary discussion of project outcomes and potential for future collaborations. Before the meeting closed, the participants shared their views and opinions about the Roundtable concluded the meeting.

Specific outcomes and future collaborations identified include:

- An academic paper describing the process and results of this workshop (in preparation)
- A policy brief regarding the future sustainability of global seafood (in preparation)
- Software/toy model on scenario building (an idea)
- Transfer of scenario building process developed in this Roundtable to local levels (a proposal for a case study in collaboration between the Roundtable PIs and participants have been submitted)
- Presentation to industry and get feedback (being planned)

Questionnaire survey

We conducted a survey on the participants' understanding of cross-cutting marine issues such as climate change and coastal food security before and after their participation in the Roundtable. Methodologies for integration of natural and socio-economic perspectives in scenario making are increasingly formalized, systematized and standardized. However, evidence on the effects of scenario building exercise on the participants' view about the future of ocean sustainability is limited. Thus, we conducted this survey to understand the impact of scenario development

exercise before and after the participation of the scenario building process in order to advance our knowledge about the effectiveness of interdisciplinary collaboration in scenario development in understanding future ocean sustainability.



A photo of some of the Roundtable participants during a walk to the beach on the final day of the workshop.