The 8th    IMBeR Symposium & TC

Why Human Dimensions today?

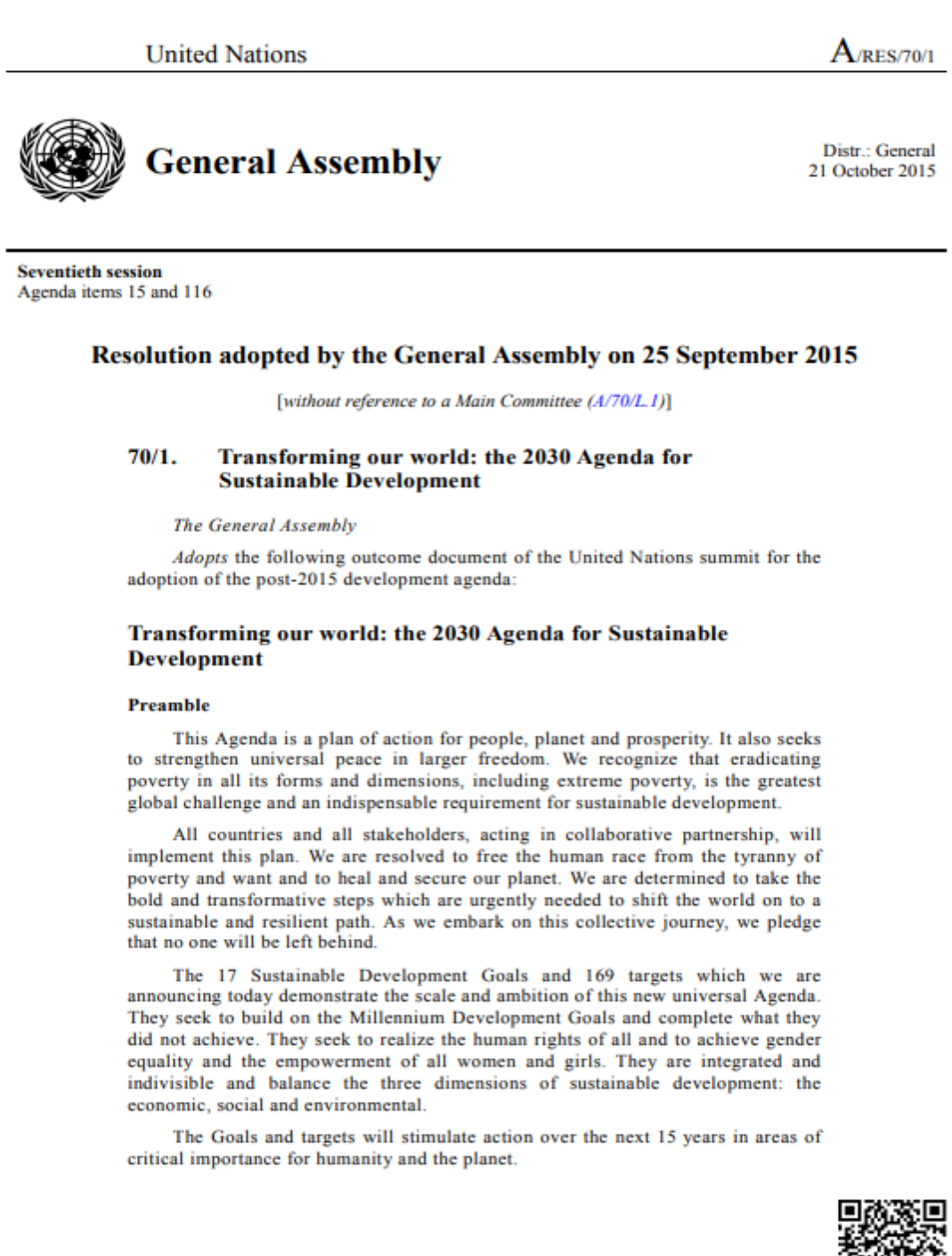
The meaning of integration of natural science and social science

Mitsutaku Makino, M.A., M.Phil. Ph.D

PICES Human Dimensions Committee Vice Chair

IMBER WG-HD Associate Member


SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS



United Nations A/RES/70/1

General Assembly

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Seventieth session
Agenda items 15 and 116

Resolution adopted by the General Assembly on 25 September 2015

[*without reference to a Main Committee (A/70/L.1)*]

70/1. Transforming our world: the 2030 Agenda for Sustainable Development

The General Assembly

Adopts the following outcome document of the United Nations summit for the adoption of the post-2015 development agenda:

Transforming our world: the 2030 Agenda for Sustainable Development

Preamble

This Agenda is a plan of action for people, planet and prosperity. It also seeks to strengthen universal peace in larger freedom. We recognize that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development.

All countries and all stakeholders, acting in collaborative partnership, will implement this plan. We are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet. We are determined to take the bold and transformative steps which are urgently needed to shift the world on to a sustainable and resilient path. As we embark on this collective journey, we pledge that no one will be left behind.

The 17 Sustainable Development Goals and 169 targets which we are announcing today demonstrate the scale and ambition of this new universal Agenda. They seek to build on the Millennium Development Goals and complete what they did not achieve. They seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls. They are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental.

The Goals and targets will stimulate action over the next 15 years in areas of critical importance for humanity and the planet.

Transforming our world: the 2030 Agenda for Sustainable Development (So called, SDGs)

The outcome documents of the United Nations summit adopted by the General Assembly on 25 September 2015

Transforming our world:
the 2030 Agenda for Sustainable Development (SDGs.)

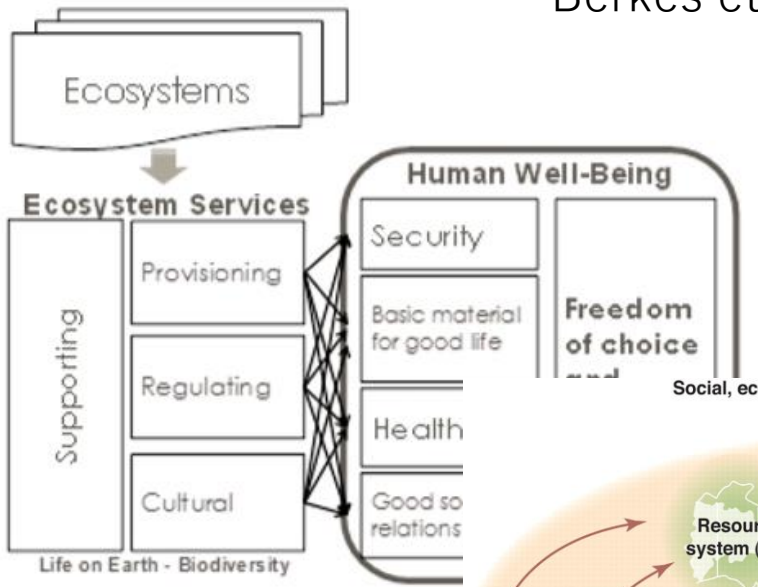
- Declaration: “We recognize that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development. We are committed to achieving sustainable development in its three dimensions — economic, social and environmental — in a balanced and integrated manner.”

Why in Three Dimensions?
(Economic, Social, and Environmental)

- The good natural scientific arguments for management actions are sometimes not accepted or implemented because of the perceived socio-economic or cultural costs.
- we need the realistic arguments to achieve SDGs in the society.
- In order to do that, the integrated understanding of how ecosystem changes affect human social systems, and vice versa, is necessary.

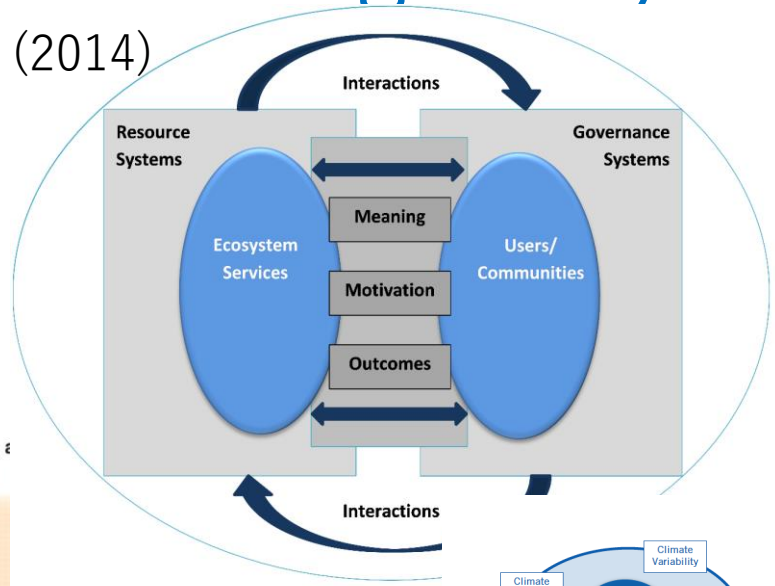
Social-Ecological Systems (SES) Approach

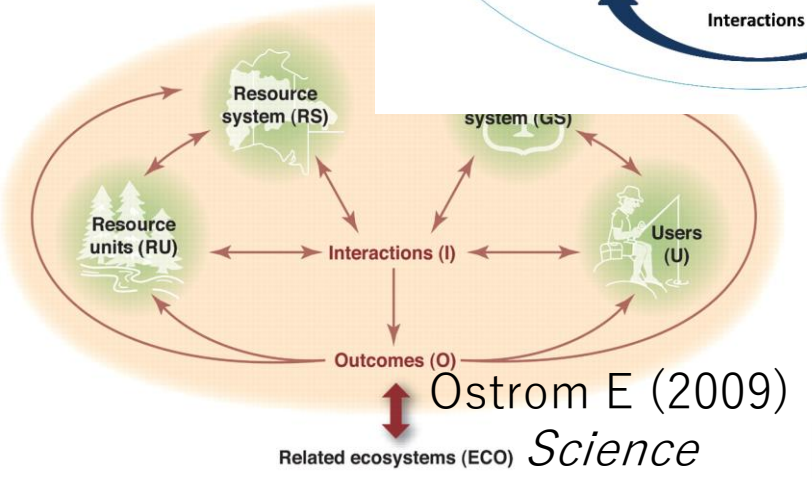
Examples of the Social-Ecological Systems (SES) Concepts



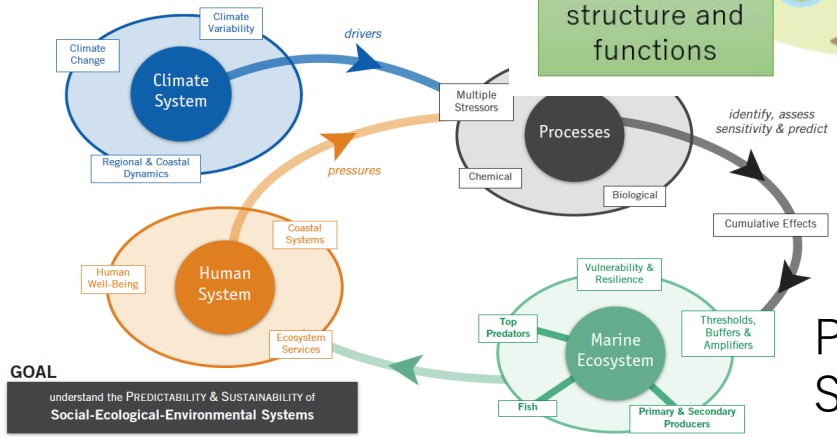
Millennium Ecosystem Assessment (2005)

Berkes et al. (2014)

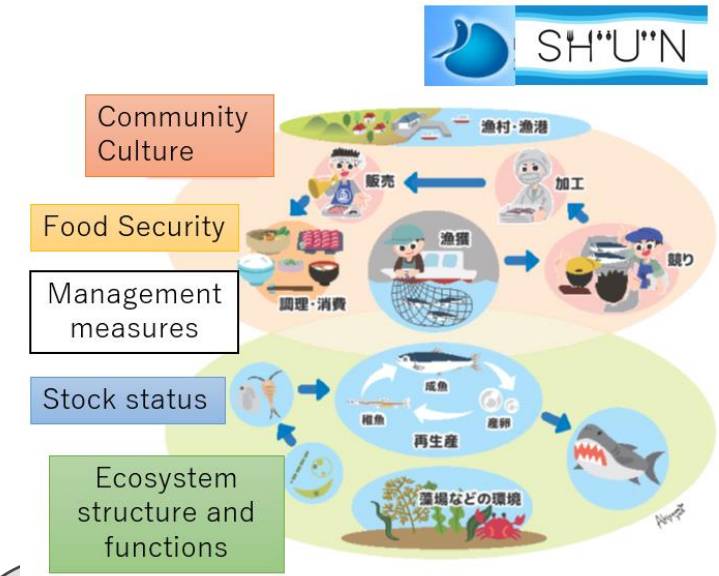




Ostrom E (2009) *Science*



PICES FUTURE SSC (2015)



FRA (2016)

Recognition that Ecological Systems and Human Systems as dimensions of a Greater Whole (Perry 2010)

- Deep and sharp understandings about the physical /chemical/biological processes, material circulation, energy circulation, their diversities, interactions and dynamics, etc. are, of course, indispensable! (No natural science, no sustainability science)

- In addition, we need other scientific approaches(social sciences, arts & humanities, etc.) to understand the mechanism/dynamics of the social systems, and their interactions with ecological systems (arrows in the concepts).

Naturally, the Multi-Disciplinary Approach is needed.

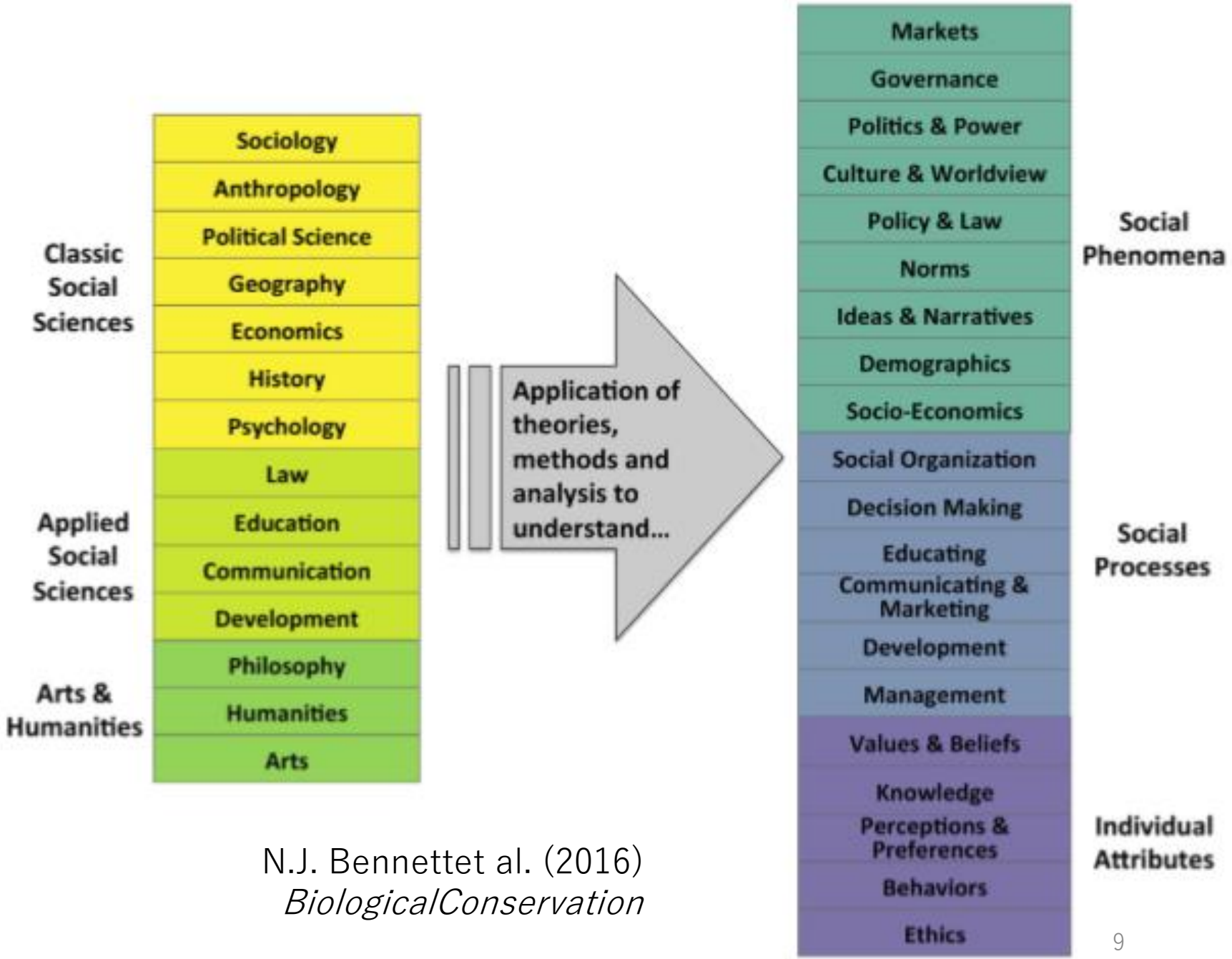
Definition of “Ocean Science” by UNESCO

2017 Global Ocean Science Report

“…all research disciplines related to the study of the ocean: physical, biological, chemical, geological, hydrographic, health, and social sciences, as well as engineering, the humanities, and multidisciplinary research on the relationship between humans and the ocean. Ocean science seeks to understand complex, multi-scale social-ecological systems and services….”

The social science disciplines

(incl. Arts and Humanities)



N.J. Bennettet al. (2016)
BiologicalConservation

Some examples of the Human Dimension topics relating to the Marine SES

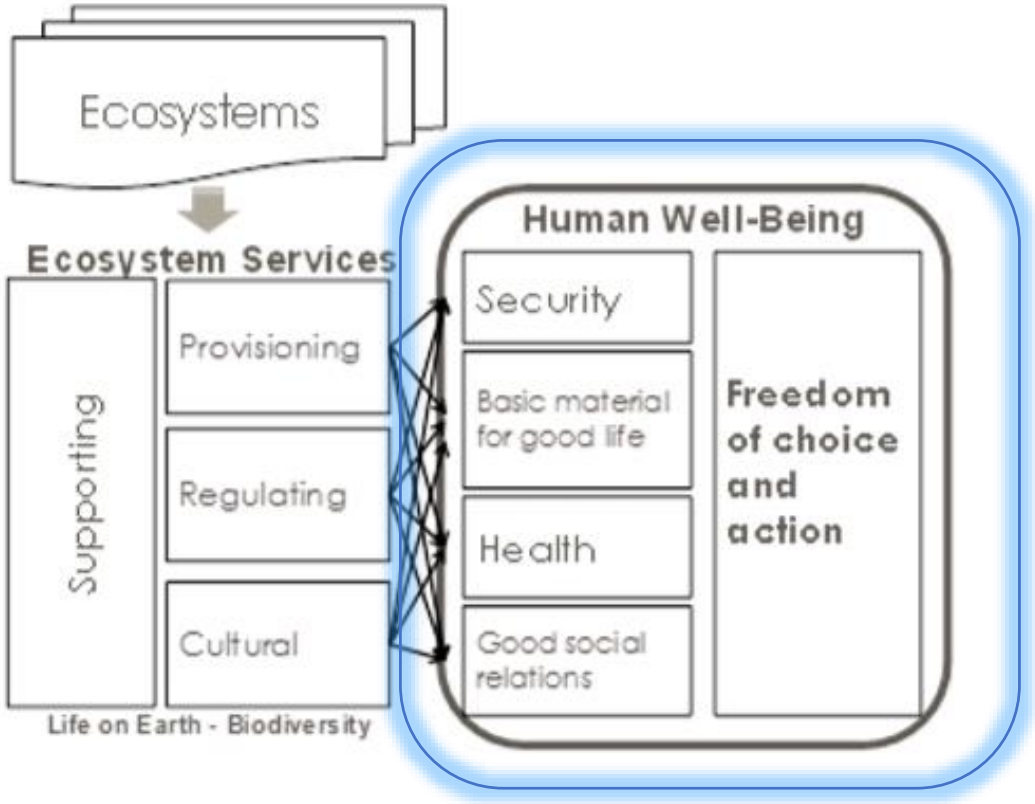
1. Definition of “Fisheries Resources”
2. Value system for marine ecosystem services
3. Management objectives and effectiveness
4. Dynamics (interactions) within Social and Ecological Systems

Etc.etc.

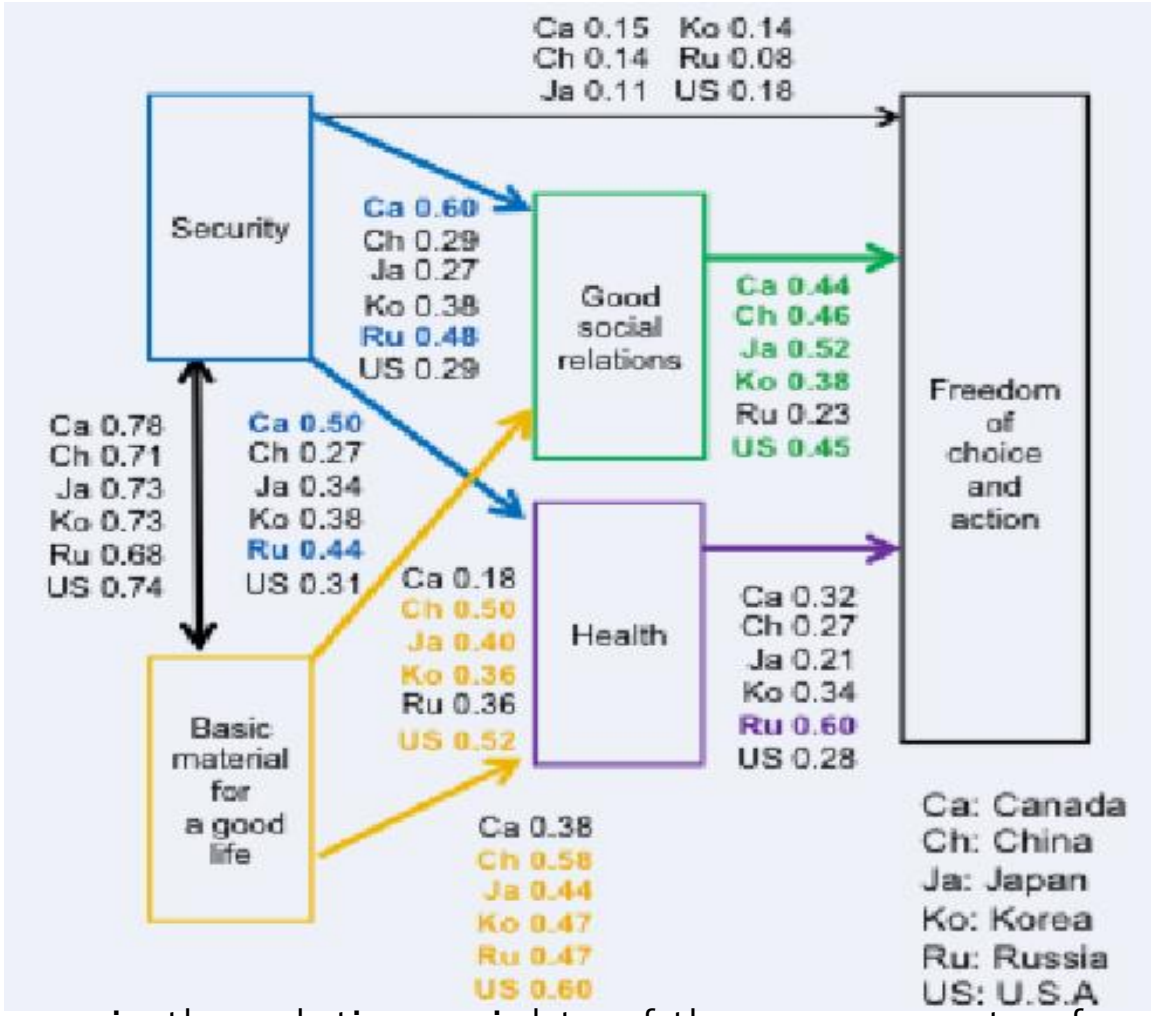
1. Definition of the resources

- Natural resources are not fixed things. Their meaning and value evolves as humans develop the scientific and technical knowledge to transform them into useful commodities in the society and as humans ascribe intrinsic value to them (Zimmermann 1933).

2. Value system for marine ecosystem services



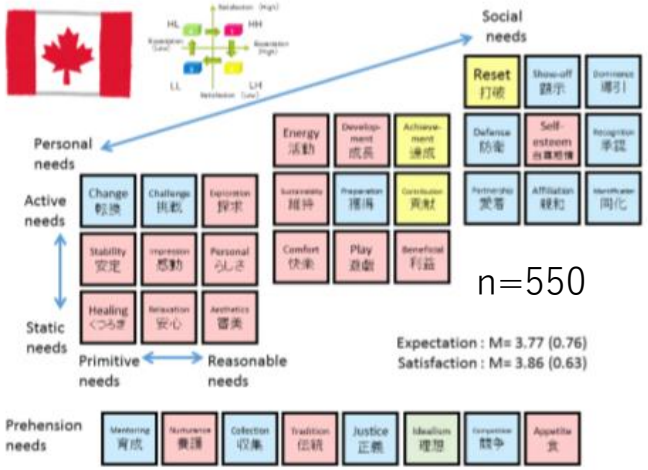
Millennium Ecosystem Assessment (2005)

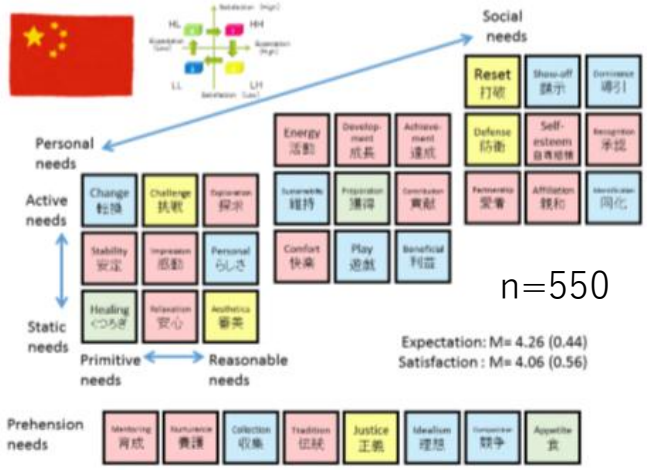


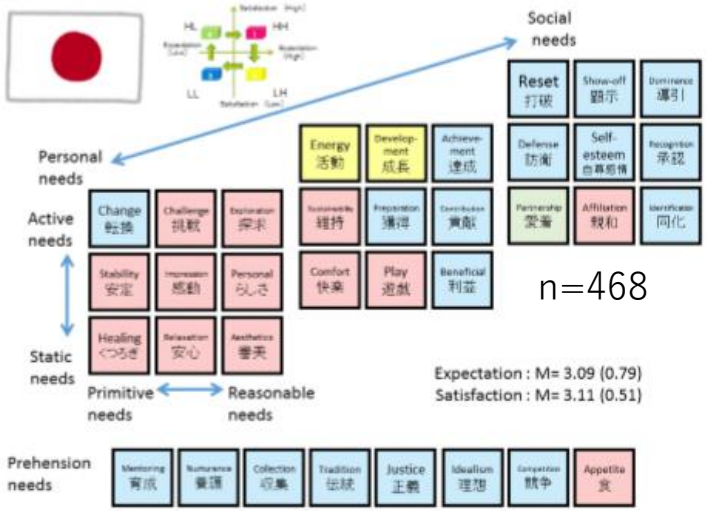
Differences in the relative weights of the components of Human Well-being (Hori and Makino in *Marine Policy, printing*)

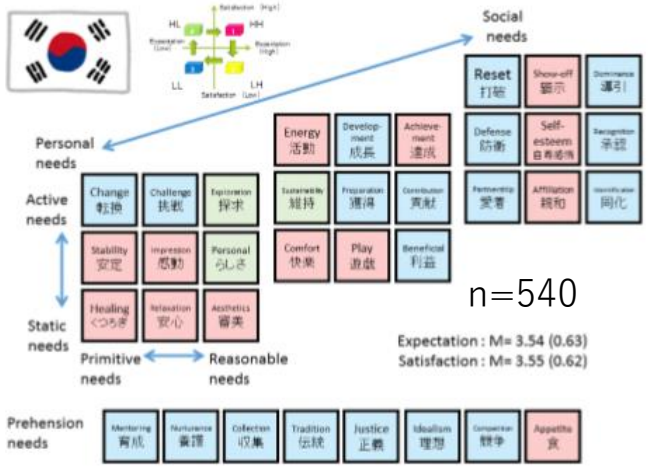
2. Value system for marine ecosystem services

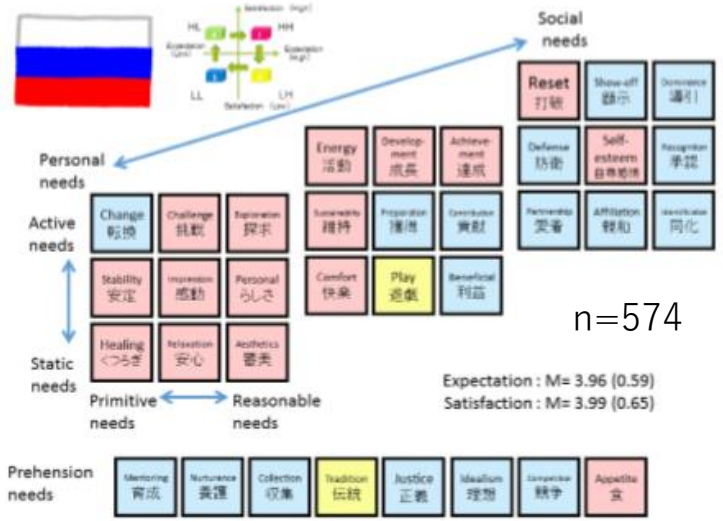
Psychological cube by Hori and Makino (2017) PICES Sci. Rep. No.52

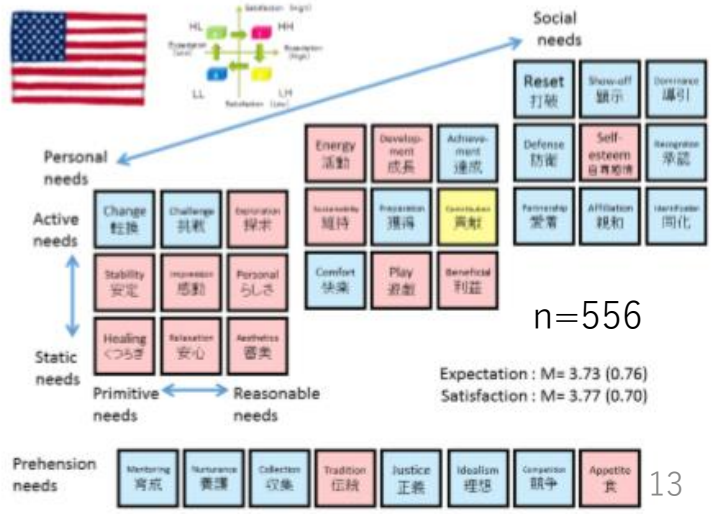










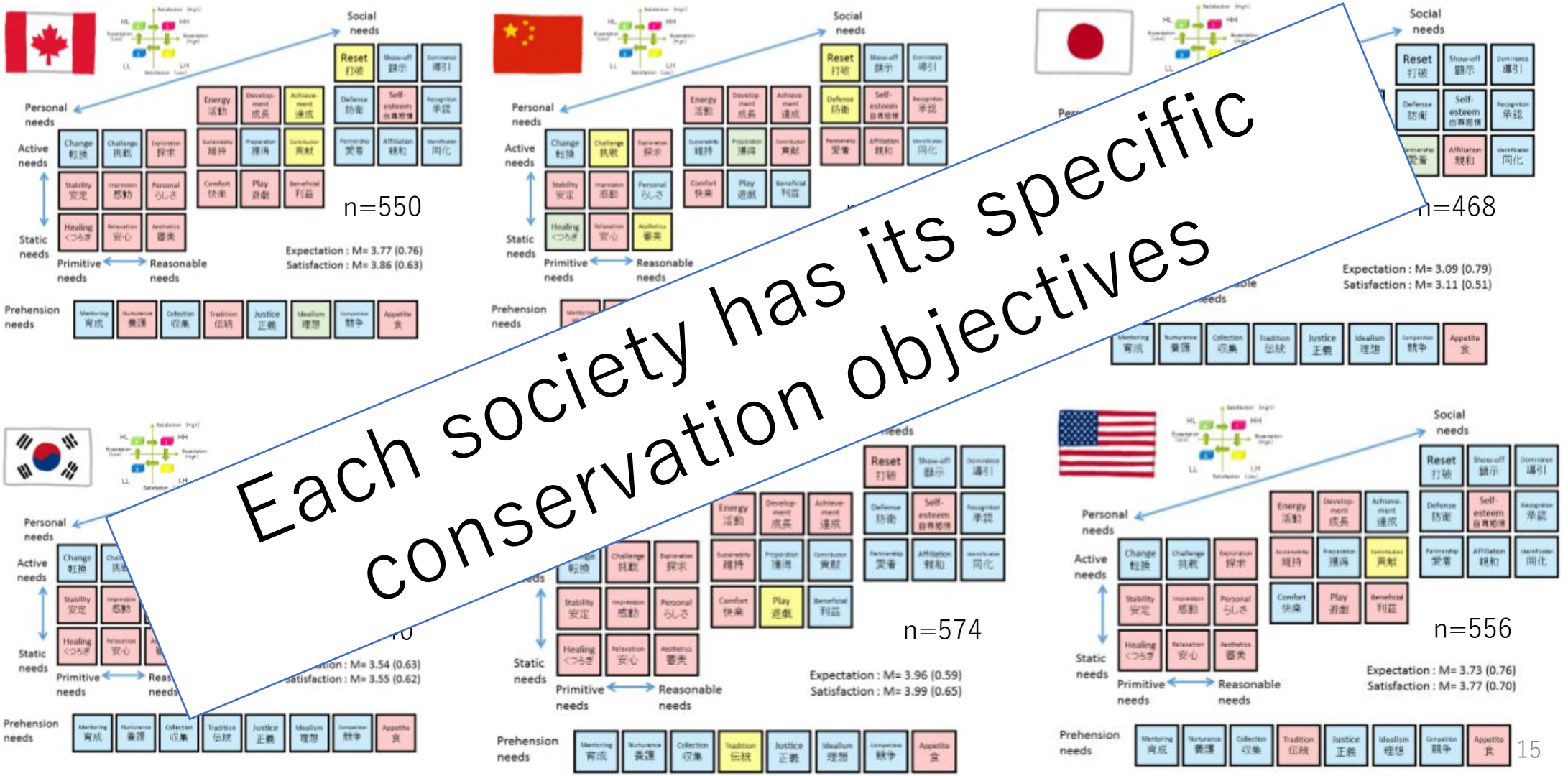


Cube no.	Question items
1	Healing : Sense of support, grounding and positivity
2	Relaxation : Feel relieved and secure
3	Aesthetics : Appreciation of beauty, *e.g.*, music, pictures, and other favorite things
4	Stability : Live comfortably with something reliable or dependable
5	Impression : Experience a range of positive feeling
6	Personal : Create own (private) world
7	Change : Change one's direction
8	Challenge : Challenge a new thing
9	Explorations : Gratify one's curiosity
10	Comfort: Feeling comfortable. Be liked by other
11	Play : Indulge in play or a favorite hobby
12	Beneficial : Gaining something without losing others
13	Sustainability : Continues being oneself
14	Preparation : State of being readiness
15	Contribution : Useful for an area or the society
16	Energy : Being energized to do something new
17	Development : Acquire knowledge, experience, and growth
18	Achievement : To reach one's goal
19	Partnership : Create new relationship
20	Affiliation : To be accepted as a peer group member

Cube no.	Question items
21	Identification : Belong to the community and share the same aims
22	Defense : Protect yourself from external harm
23	Self-esteem : Have confidence and pride toward oneself
24	Recognition: How well you are recognized in the community
25	Reset : To break free, restart anew
26	Show off : Desire to show off one's potential
27	Dominance : Have leadership and success in whatever you do
28	Mentoring : Raising and guiding the next generation
29	Nurturance : Help a person and protect them
30	Collection : Collect various things
31	Tradition : Respect family, ethnic and racial tradition
32	Justice : Carry through social justice
33	Idealism: Carry through an idea
34	Competition : To excel through competitiveness
35	Appetite : To feel satisfied

2. Value system for marine ecosystem services

Psychological cube by Hori and Makino (2017) PICES Sci. Rep. No.52



Each society has its specific conservation objectives

3. Management objectives and effectiveness

The objective of the ecosystem conservation is “a societal choice”
(Convention on Biological Diversity’s Ecosystem Approach Principle 1)

Japanese Image of “Beautiful Coastal Ecosystem” in 250 years ago.

The Grand Design of Fisheries and Resource Management in Japan (FRA 2009)

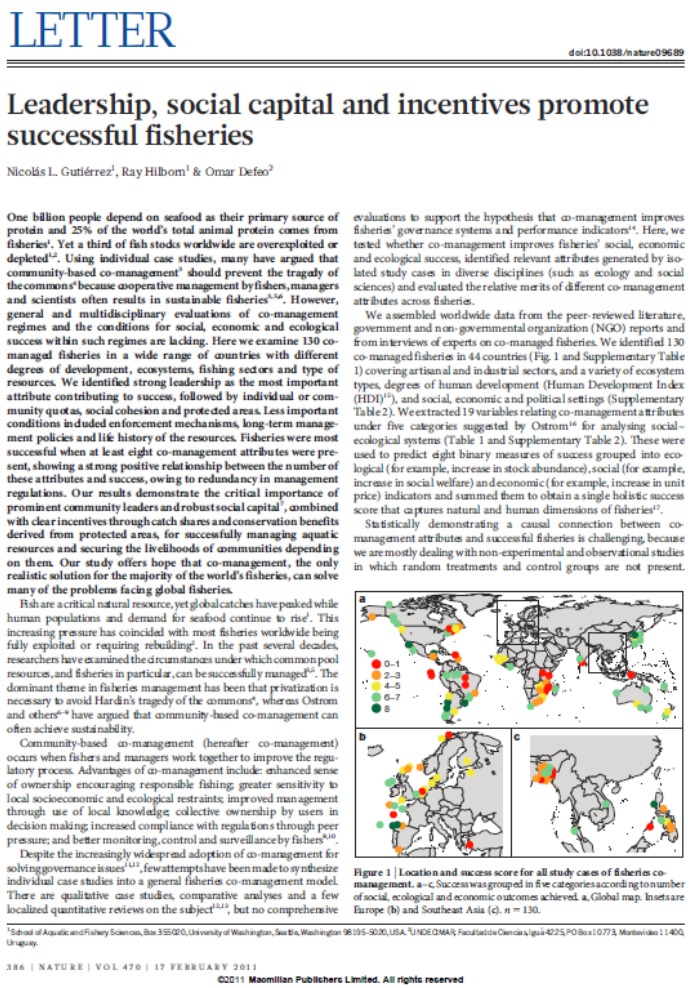
3. Management objectives and effectiveness

- R Hilborn (2007) defined the 4 types of the "successes" in fisheries management; Maximum Sustainable Yield (MSY), Maximum Economic Yield (MEY), Maximum Job Yield (MJY), and Minimum Sustainable Whinge (MSW).

- K Miyagawa (1994) defined the 6 criteria for policy assessment: Efficiency, Effectiveness, Sufficiency, Fairness, Responsiveness, and Appropriateness.

- Also, social sciences are good at discussing the institutional/organizational scales for the management.

3. Management objectives and effectiveness: A case of Fisheries Management



LETTER

doi:10.1038/nature09689

Leadership, social capital and incentives promote successful fisheries

Nicolás L. Gutiérrez[1], Ray Hilborn[1] & Omar Defeo[2]

One billion people depend on seafood as their primary source of protein and 25% of the world's total animal protein comes from fisheries[1]. Yet a third of fish stocks worldwide are overexploited or depleted[1,2]. Using individual case studies, many have argued that community-based co-management[3] should prevent the tragedy of the commons[4] because cooperative management by fishers, managers and scientists often results in sustainable fisheries[5,5,6]. However, general and multidisciplinary evaluations of co-management regimes and the conditions for social, economic and ecological success within such regimes are lacking. Here we examine 130 co-managed fisheries in a wide range of countries with different degrees of development, ecosystems, fishing sectors and type of resources. We identified strong leadership as the most important attribute contributing to success, followed by individual or community quotas, social cohesion and protected areas. Less important conditions included enforcement mechanisms, long-term management policies and life history of the resources. Fisheries were most successful when at least eight co-management attributes were present, showing a strong positive relationship between the number of these attributes and success, owing to redundancy in management regulations. Our results demonstrate the critical importance of prominent community leaders and robust social capital[7], combined with clear incentives through catch shares and conservation benefits derived from protected areas, for successfully managing aquatic resources and securing the livelihoods of communities depending on them. Our study offers hope that co-management, the only realistic solution for the majority of the world's fisheries, can solve many of the problems facing global fisheries.

Fish are a critical natural resource, yet global catches have peaked while human populations and demand for seafood continue to rise[1]. This increasing pressure has coincided with most fisheries worldwide being fully exploited or requiring rebuilding[2]. In the past several decades, researchers have examined the circumstances under which common pool resources, and fisheries in particular, can be successfully managed[8,9]. The dominant theme in fisheries management has been that privatization is necessary to avoid Hardin's tragedy of the commons[4], whereas Ostrom and others[6–9] have argued that community-based co-management can often achieve sustainability.

Community-based co-management (hereafter co-management) occurs when fishers and managers work together to improve the regulatory process. Advantages of co-management include: enhanced sense of ownership encouraging responsible fishing; greater sensitivity to local socioeconomic and ecological restraints; improved management through use of local knowledge; collective ownership by users in decision making; increased compliance with regulations through peer pressure; and better monitoring, control and surveillance by fishers[8,10].

Despite the increasingly widespread adoption of co-management for solving governance issues[1,11,12], few attempts have been made to synthesize individual case studies into a general fisheries co-management model. There are qualitative case studies, comparative analyses and a few localized quantitative reviews on the subject[1,2,13], but no comprehensive evaluations to support the hypothesis that co-management improves fisheries' governance systems and performance indicators[14]. Here, we tested whether co-management improves fisheries' social, economic and ecological success, identified relevant attributes generated by isolated study cases in diverse disciplines (such as ecology and social sciences) and evaluated the relative merits of different co-management attributes across fisheries.

We assembled worldwide data from the peer-reviewed literature, government and non-governmental organization (NGO) reports and from interviews of experts on co-managed fisheries. We identified 130 co-managed fisheries in 44 countries (Fig. 1 and Supplementary Table 1) covering artisanal and industrial sectors, and a variety of ecosystem types, degrees of human development (Human Development Index (HDI)[15]), and social, economic and political settings (Supplementary Table 2). We extracted 19 variables relating co-management attributes under five categories suggested by Ostrom[16] for analysing social–ecological systems (Table 1 and Supplementary Table 2). These were used to predict eight binary measures of success grouped into ecological (for example, increase in stock abundance), social (for example, increase in social welfare) and economic (for example, increase in unit price) indicators and summed them to obtain a single holistic success score that captures natural and human dimensions of fisheries[17].

Statistically demonstrating a causal connection between co-management attributes and successful fisheries is challenging, because we are mostly dealing with non-experimental and observational studies in which random treatments and control groups are not present.

Figure 1 | Location and success score for all study cases of fisheries co-management. a–c, Success was grouped in five categories according to number of social, ecological and economic outcomes achieved. **a**, Global map. Insets are Europe (**b**) and Southeast Asia (**c**). $n = 130$.

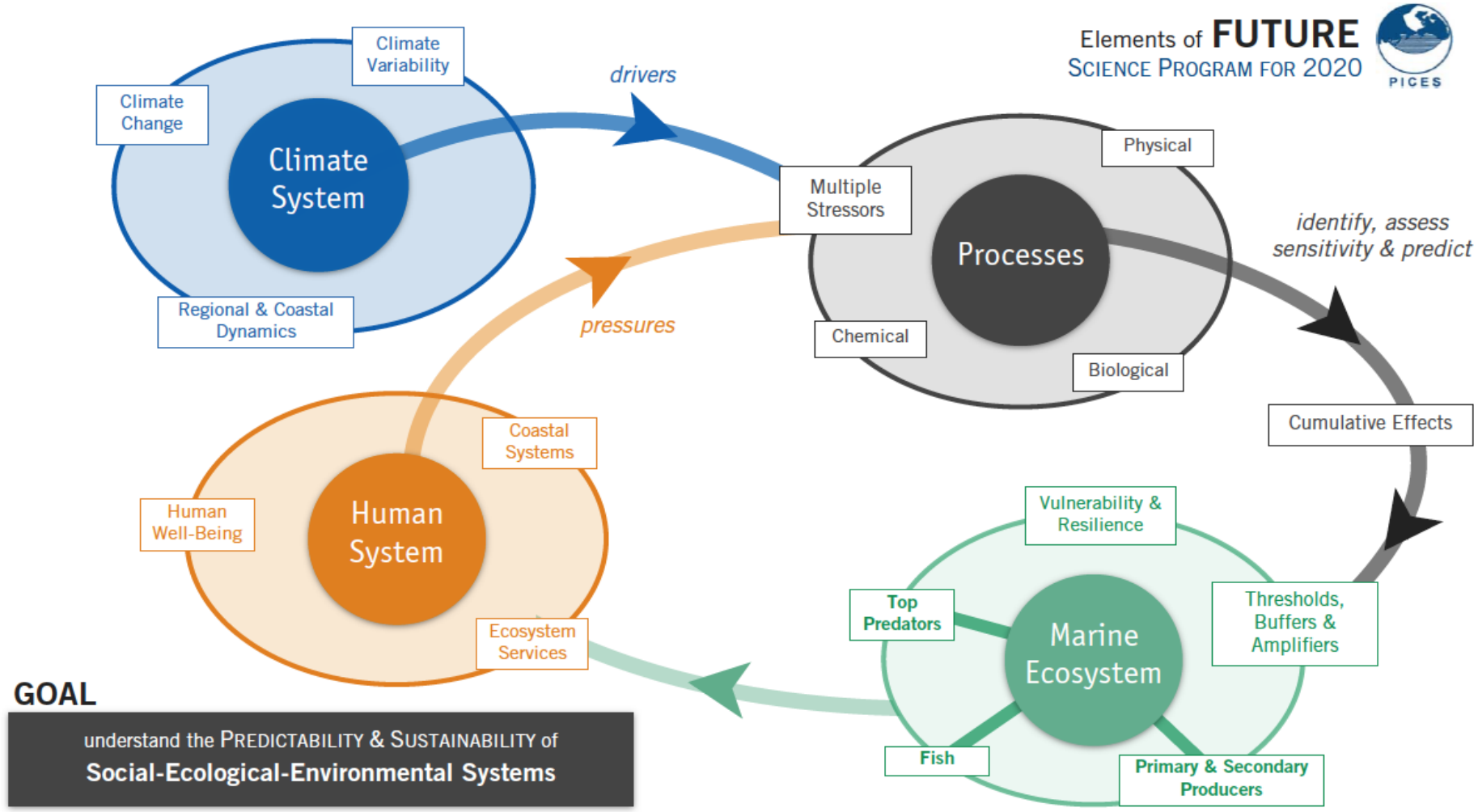
[1]School of Aquatic and Fishery Sciences, Box 355020, University of Washington, Seattle, Washington 98195-5020, USA. [2]UNDECIMAR, Facultad de Ciencias, Iguá 4225, PO Box 10773, Montevideo 11400, Uruguay.

Nature Vol.470: 386-389 (2011)

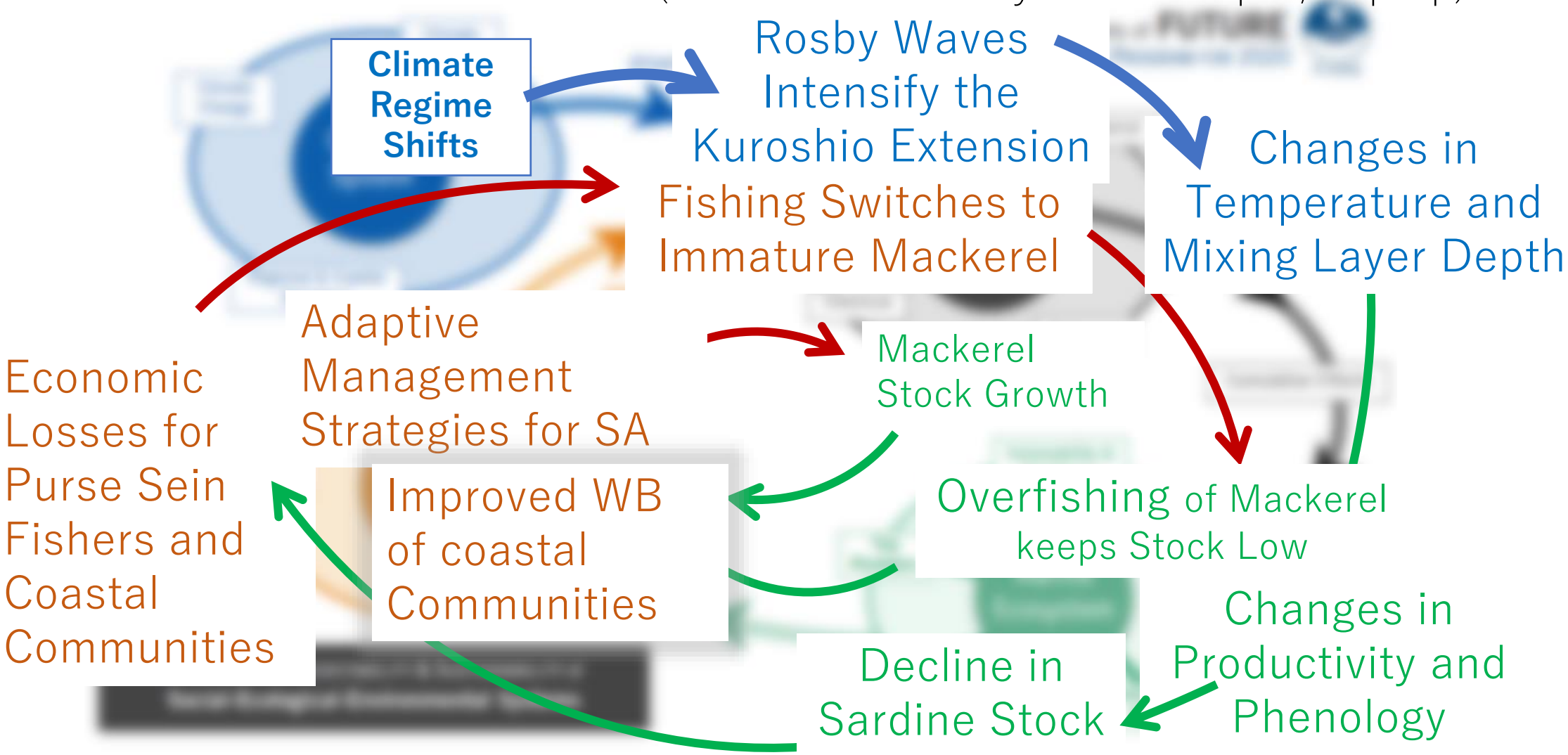
- Social factors such as the Leadership, Social Capital, and Incentives, are the main factors which decide the effectiveness of fisheries management.

4. Dynamics (interactions) in SES

Species Alternation (Sardine and Mackerel) in the Northwestern Pacific (PICES FUTURE Synthesis Paper, in prep)

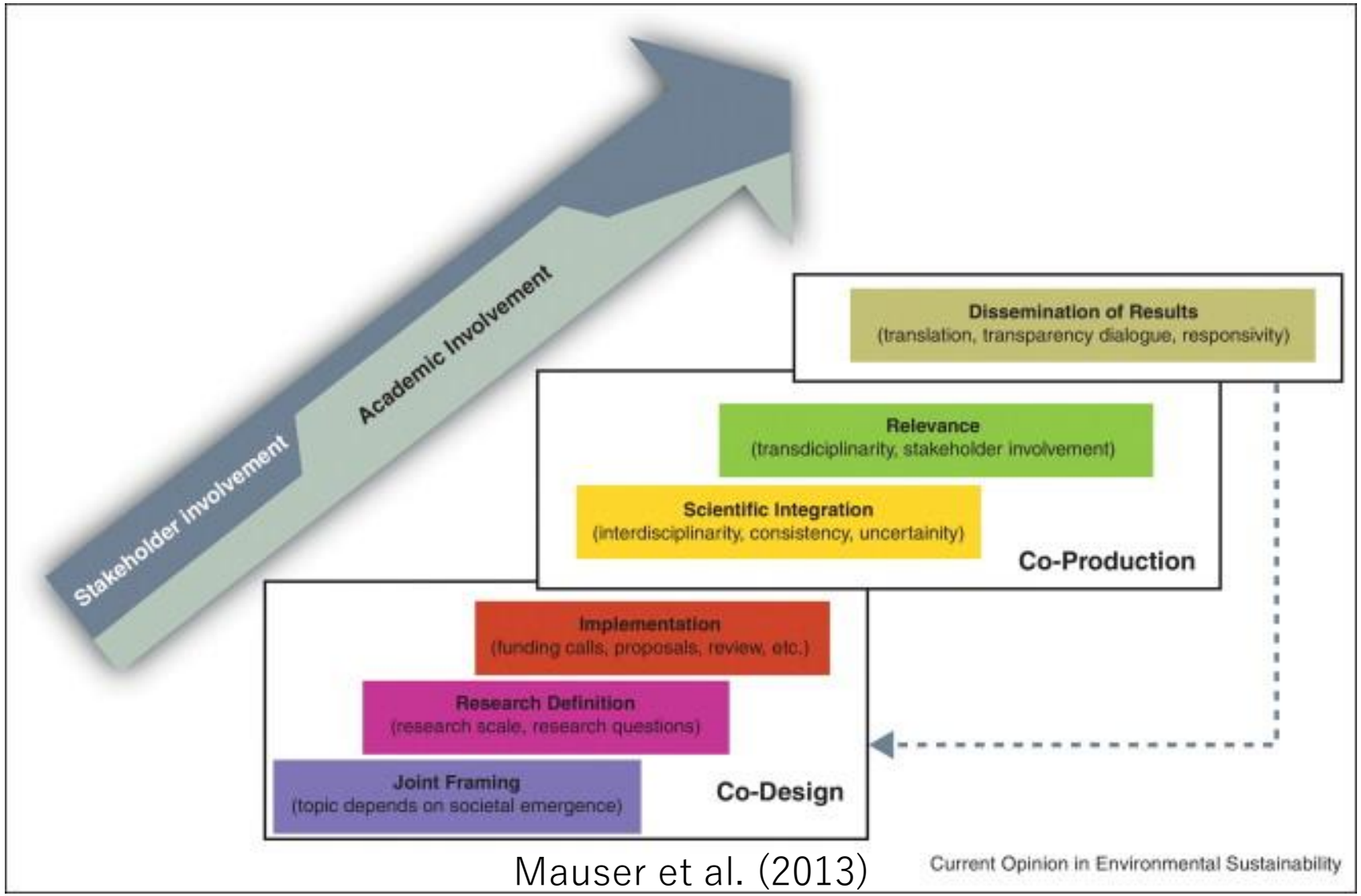


4. Dynamics (interactions) in SES Species Alternation (Sardine and Mackerel) in the Northwestern Pacific (PICES FUTURE Synthesis Paper, in prep)



futureearth
research for global sustainability

Transdisciplinary Research



Mauser et al. (2013)

- Stakeholder involvement is recommended to facilitate innovation and implementation
- How to define/select the stakeholder is the critical issue.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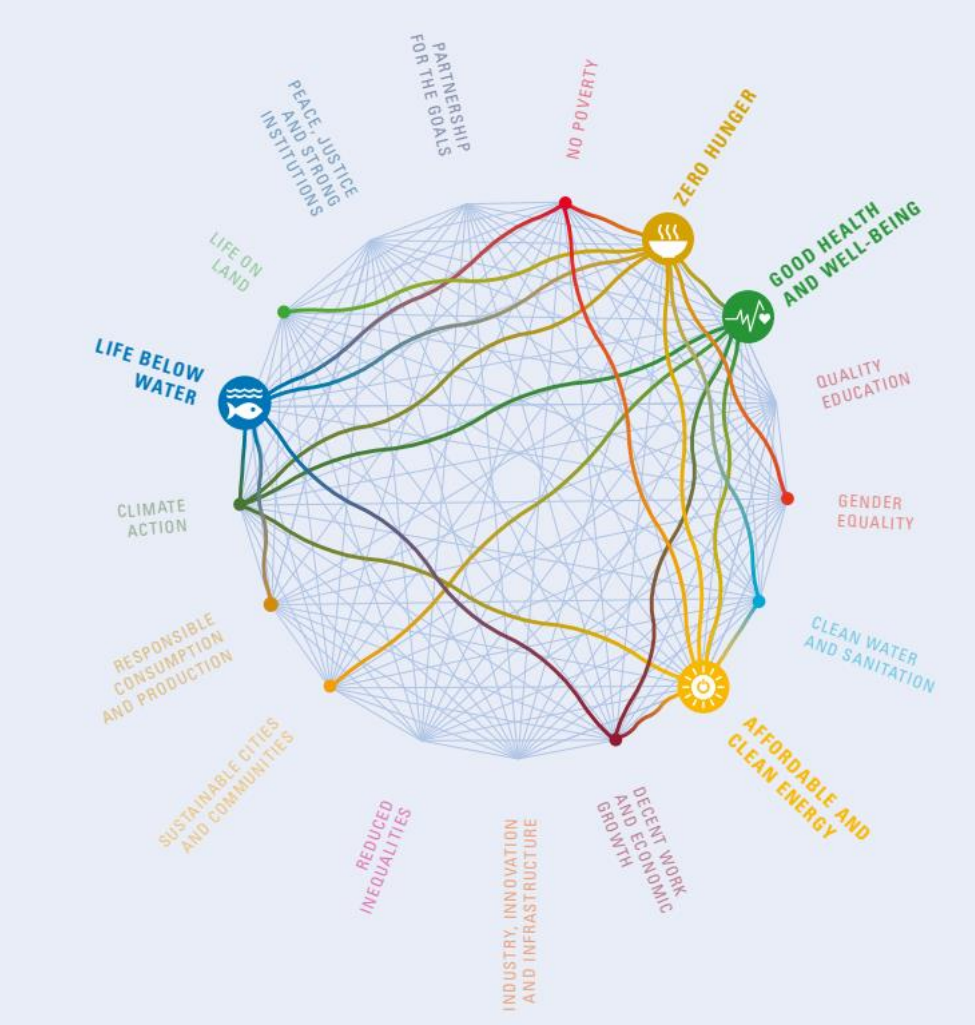
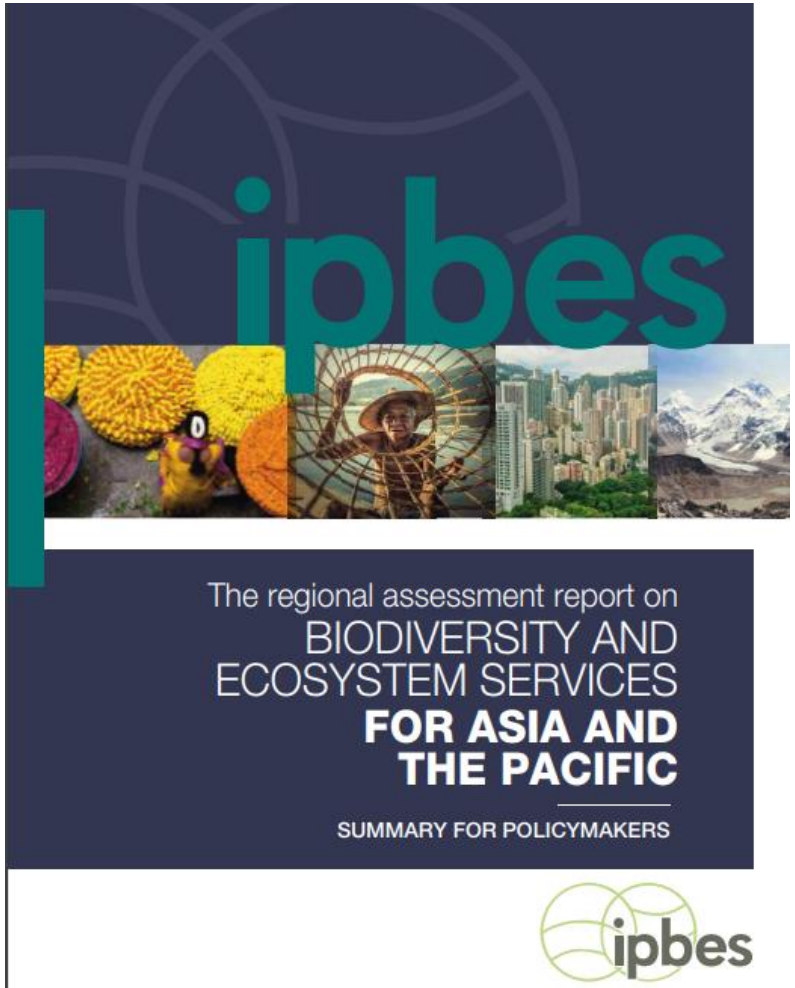
Many issues are inter-linked (ICSU 2017)



- 14 Marine is closely linked with 2 Hunger, 3 Health and well-being, 7 Energy, 1 Poverty, 8 Economic growth, 13 Climate, etc.
- Many Stakeholders and High Uncertainty
- Nexus Approach is important.

IPBES Asia Pacific Regional Assessment : Some of the Key messages



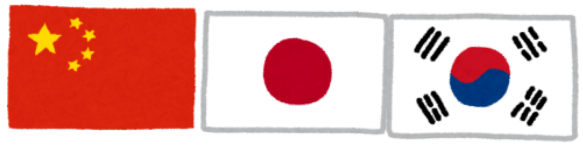
- Economics: The Asia-Pacific region has achieved rapid economic growth…
- Culture: The diverse values and value systems across the Asia-Pacific region …
- Food: People in the Asia-Pacific region depend heavily on fisheries for food…
- Community: Local communities and stakeholders collaborating in decision-making processes …

Summary: Why HD Today?

- We need the balance of environmental, social and economic aspects.
- In order to analyze this balance, we need the SES approach. Ecological and Social Systems are dimensions of the greater whole.
- Social sciences can discuss relevant HD issues such as the definition of the resource, value system, management objectives, effectiveness, dynamics within SES, stakeholders, etc., etc.
- The Integration of social sciences improves the value of natural science for better understandings and implementation by the society.

Let's Research Together!!

Final remarks



- Social Science is useful to recognize the differences between us, to pay respects to the differences, and to build mutual understanding.
- At the same time, natural science is the knowledge to link 3 of us in the West Pacific.
- So, better scientific understanding of the West Pacific SES is the key for the further friendship of CJK.
- Please enjoy the symposium and make friends in CJK. That friendship will lead to the new CJK culture for the Sustainable West Pacific. Good Luck!