

Second Meeting of the Project Science Team for the PICES/MAFF Project on “Marine Ecosystem Health and Human Well-Being”

The second meeting of the Project Science Team for the PICES/MAFF project on “*Marine ecosystem health and human well-being*” was held on June 10–12, 2013, in Honolulu, Hawaii, USA. The meeting was co-chaired by Drs. Mitsutaku Makino (Japan) and Ian Perry (Canada).

The meeting participants are identified in *Appendix 1*, and the meeting agenda is presented in *Appendix 2*.

DAY 1 – JUNE 10, 2013

The first day of the meeting was devoted to presentations and discussions of project accomplishments and achievements to date. The project’s objectives were reiterated as to identify the relationships between sustainable human communities and sustainable marine ecosystems in the North Pacific, under the concept of fishery social-ecological systems. Specifically, considering the global changes in climate and human social and economic conditions, determine: a) how do marine ecosystems support human well-being; and b) how do human communities support sustainable and productive marine ecosystems.

Prince’s Trust Meeting

The International Sustainability Unit (ISU) of the UK Prince Charles’ Charitable Foundation has a marine program (<http://www.pcfisu.org/marine-programme>) which, among other objectives, was initiated to help strengthen consensus around the best solutions for the sustainable management of wild marine fish stocks. Among other activities, the ISU recently released a report based on interviews with fishing communities from 50 different fisheries around the world about the benefits they are experiencing from managing their fisheries more sustainably. The report demonstrates the possibilities for more sustainable management through what is already being achieved (http://pcfisu.org/wp-content/uploads/pdfs/TPC1224-Princes-Charities-case-studies-report_WEB-29-03.pdf). The ISU is now developing a project to implement Fisheries Management Plans (FMP) and Transition Financing, and is considering Vietnam and Central America as primary locations. In this regard, the ISU organized a regional workshop on “*The opportunities of sustainable fisheries in Vietnam: Identifying the transition pathway*” (October 30–31, 2012, Nha Trang, Vietnam), which was co-sponsored by PICES (through the PICES/MAFF project). Although a useful meeting, it turned out to be somewhat off the main topic of our project. It was recommended that our project be informed of developments within the ISU but, at this stage, not to actively participate.

Results of the Two Indonesia Workshops

The planning meeting for this case study was held January 22–23, 2013, at BPPT (*Badan Pengkajian dan Penerapan Teknologi*; the Agency for the Assessment and Application of Technology), Jakarta, which is a non-departmental government agency under the coordination of the Ministry of Research and Technology responsible for carrying out government duties in the field of assessment and application of technology. Drs. Mitsutaku Makino, Masahito Hirota and Mark Wells participated on behalf of the Project Science Team; the Indonesian counterpart was Prof. Suhendar Sachoemar. The objectives of this meeting were to understand the local needs, to prepare the draft agenda of the First Indonesia workshop to be held in March of 2013, and to develop plans for this case study through to 2017 (the PICES-MAFF Project period).

Local needs were well-defined by local authorities. Many coastal mangroves were cut for the development of shrimp aquaculture in the 1990s, causing much erosion. In one location on the north coast of Java, three kilometers of coastline were lost due to this development. Local government (and BPPT) started a program called “Gapura” based on the concept of Sato-umi (see Fig. 1). The design stipulates the establishment of multi-trophic level aquaculture, including *Tilapia*, shrimp, *Gracilaria*, green mussel. This will be established

initially in Karawang (Java), but the Indonesians would like to expand this idea to other areas. If this is not put into place, there is the danger that these coastal developed areas will be eroded. The current focus is on developing useful products from these aquaculture facilities. However, they have not monitored impacts to local systems or environmental quality (nutrients, bacteria, phytoplankton). The Indonesian government would like to scientifically verify this activity, build capacity, and disseminate the concept to other areas of Indonesia. However, dissemination to other areas needs to be preceded by scientific verification.

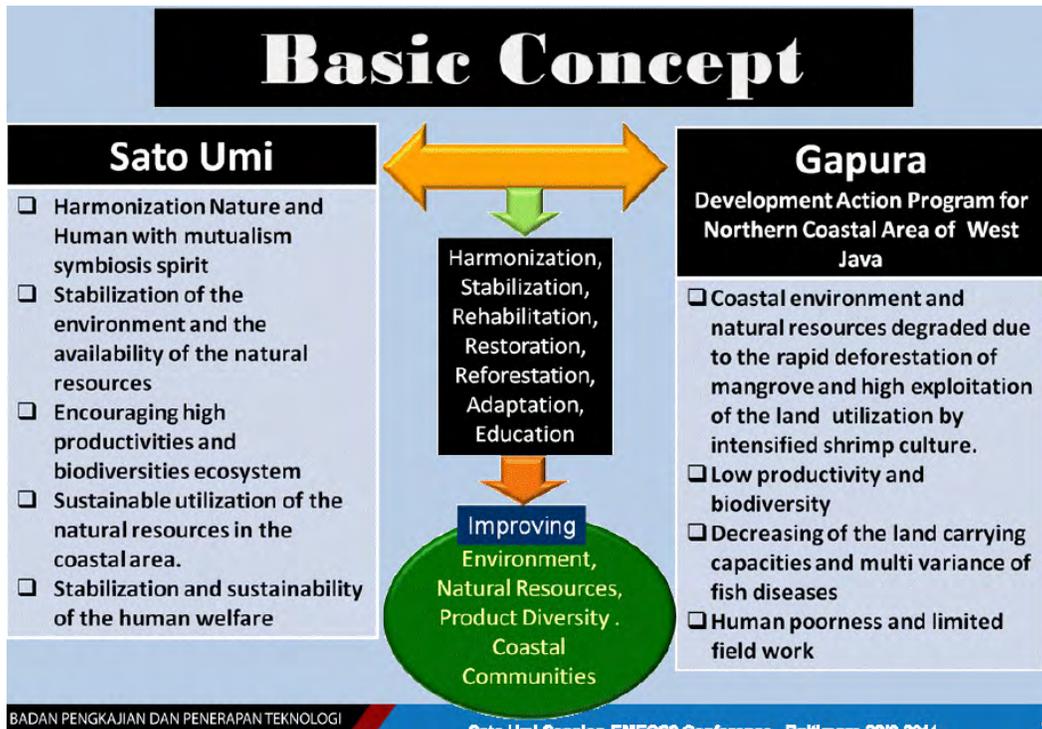


Fig. 1 Relationships between Sato-umi and Gapura concepts (from presentation by S. Sachoemar and T. Yanagi, PICES-BPPT Workshop, Jakarta, March 2013).

The results from the discussion at the January 2013 meeting were used to plan the First PICES/MAFF Workshop, which was held on March 13, 2013, at BPPT Headquarters in Jakarta, with a field trip to the site at Karawang on March 14.

A survey to identify local needs for participation by the PICES/MAFF project was not needed for this case of Indonesia, as these issues were already well identified (improve community welfare in north coastal Java, rehabilitate the coastal ecosystem; improve infrastructure facilities in this region; increase the diversity of fishery products, their value and competitiveness), and the general concept of Sato-umi was already known (and translated into local concepts). In discussion at the workshop, it became clear that there were two concepts involved in the implementation of Sato-umi in Indonesia: “Gapura”, which refers to improved productivity of aquaculture and indicates the pilot study, and “Gempita”, which is the broader Indonesian term for “Sato-umi”. The intent now is to combine Gapura and Gempita. Dr. Makino presented the overall results of the workshop. There were 93 participants total from Japan FRA, MAFF, US, and Indonesian agencies. In attendance for the PICES/MAFF project were Drs. Mitsutaku Makino, Masahito Hirota, Mark Wells, and William Cochlan. It was a high-profile in Indonesia, with the opening address given by the Director of the Centre for Agriculture Production Technology-BPPT and many reports appearing in newspapers, on TV and the web. The draft agenda, workshop report, and related documents are provided in *Appendix 3*. The workshop report is also available at <http://www.pices.int/projects/MarWeb.aspx>, and a PICES Press article is posted at http://www.pices.int/publications/pices_press/volume21/v21-n2/pp_18-19_PICES_MAFF-Wsh.pdf.

There were 6 principal outcomes from the workshop:

- The meeting itself, and a report;
- A letter of intent between PICES and BPPT for continued collaborative work on this project;
- A workshop summary and action plans;
- Draft contents of a manual to assist with spreading these concepts to other coastal areas of Indonesia;
- A draft experimental protocol for pond experiments;
- Draft list of parameters to be measured during these pond experiments.

The second day of workshop was a visit to Karawang Province to a local government lab and a national lab. The PICES participants determined that there is a well-equipped lab to assess scientific parameters. They are measuring bacteria, viruses, oxygen, nutrients, *etc.* – a subset of parameters that we will want to assess. Social system parameters were presented by Hirota-san. The proposal is to work with Indonesian partners and to conduct pond experiments to examine the natural and human system benefits of multi-trophic aquaculture, which would include Tilapia, shrimp, *Gracilaria*, green mussel. The list of potential parameters to assess is shown in Table 1 in *Appendix 3*. Discussion at the present meeting suggested that environmental parameters be measured both inside and outside (control) of the shrimp ponds in order to assess impacts external to the ponds. The elements for a manual for this project were identified as:

1. Introduction for the concept of Gempita
 2. Why we need Gempita
 3. How to introduce Gempita (technical how-to)
 4. How to assess the effectiveness of Gemplita (scientific how-to)
 5. Conclusions
- Glossary

Discussion on this topic included the following points:

- Value of scoping meeting: in this case the local needs are well-defined, however, an in-person meeting with key local contacts was essential to understand local needs and to plan the joint workshop;
- Need for a formal agreement (LOI): the local partners felt this was important for their process;
- What types of research are expected by PICES: a key point of discussion and outcome from the meetings. In this case it includes formal research plans;
- Focus of manual appears to be specific to Indonesia: see points below;
- List of parameters (and link to manual)
- Experimental pond – local government and national government were both willing to contribute a pond to this effort. The research is about increasing output rather than decreasing impact. The shrimp-bivalve-*Gracillaria*-mussel system has not been done previously, although perhaps additional members to the PICES team need to be added with expertise in multi-trophic aquaculture in developing regions. It was noted that, to quantify success, study of the social science aspects need to begin now to provide a baseline for assessing whether human well-being has improved. Such an assessment might include increases in product and also the variety of products, such that employment will increase, self-sufficiency of the community will increase, and there will be added value. Dr. Hirota will visit the community to assess social aspects.

There was also discussion as to the type of manuals that might be required. For example, slightly different manuals with differing amounts of detail (different levels of specificity) with some elements mixed and matched in all to meet the needs of different audiences is likely necessary:

- community members in Indonesia– 1 page overview, experiments that have been done;
- community members in Guatemala - 1 page overview, experiments that have been done;
- scientific community (PICES) – a more complete analysis of the approach and outcomes, in the context of improving Marine Ecosystem Health and Human Well-Being; perhaps leading to an article in the scholarly scientific literature.

The manuals might include note of things to measure, *e.g.*, with respect to coastal biodiversity, if these pond experiments are successful.

Lessons Learned

The “lessons learned” from this workshop experience and those of previous MAFF-sponsored projects include:

- Importance of local contacts and scoping meetings in setting the issues and determining what can be done. This also helps with engaging authorities and making sure that there is a need. Most of this work has to be done in person, not by email or Skype. Make sure project objectives fit into the local needs. Essential to have a strong local contact;
- Local governments put value in the name of PICES. This was a good achievement to hold a workshop with PICES;
- Listening is essential;
- Having a Memorandum of Agreement in place;
- Press coverage was important.

Well-being “Cube” Analysis

Drs. Makino and Hori presented the concept and initial results from the well-being “cube” analysis, as applied to survey conducted in Japan. “Well-being” is defined by psychology as involving peoples’ positive evaluations of their lives, including positive emotions, engagement, satisfaction, and meaning”. As stated in the Millennium Ecosystem Assessment (2005), human “well-being” (HWB) has multiple constituents, including basic materials for a good life, freedom and choice, health, good social relations, and security. The constituents of well-being, as experienced and perceived by people, are situation-dependent, reflecting local geography, culture, and ecological circumstances. These factors are complex and value-laden. In the present study, HWB is defined as peoples’ positive states of being satisfied, and freedom of choice and action. It has constituents of “security”, “basic materials for a good life”, “health”, and “good social relations”. The “well-being cube” approach is being explored as a means to connect ecosystem services, human well-being, and freedom of choice and action, and in part to understand motivations for these choices and actions (*e.g.*, see Fig. 2).

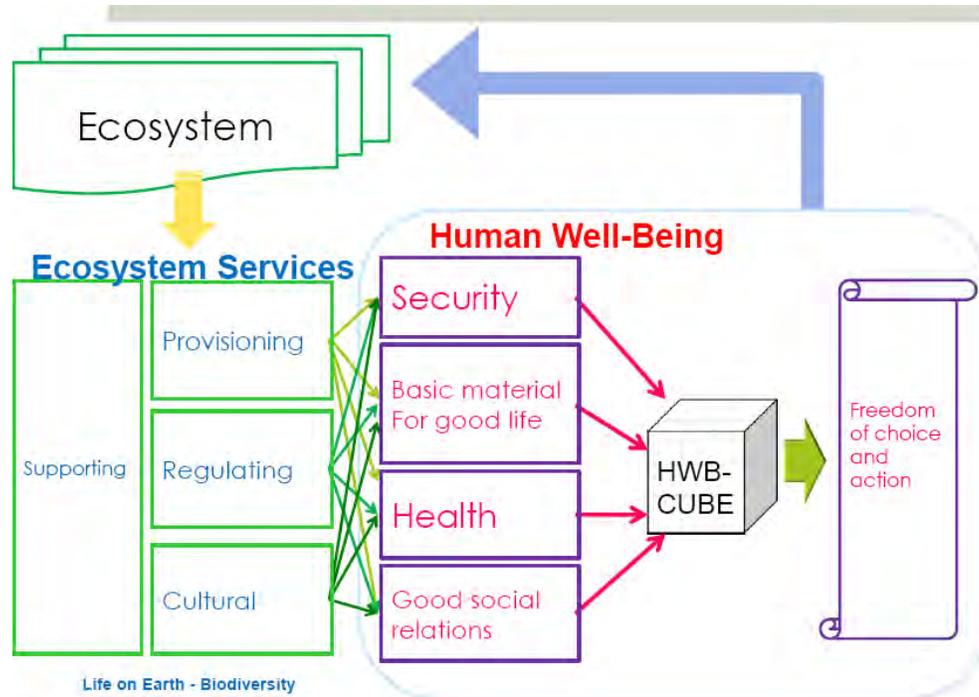


Fig. 2 Example of how the human well-being cube concept can relate ecosystem services to human well-being and freedom of choice and action (from presentation by Hori and Makino at the second Project Science Team meeting, June 2013).

The HWB-CUBE is composed of a combination of 27-human needs, determined by reference to data from previous studies about “human needs”. It has three dimensions: primitive or reasoning; level of interaction/ arousal; and relationships about self and others (Fig. 3). This approach permits the scientific calculation of the relationship between the 4 components of well-being and freedom of choice and action (Fig. 4). These concepts were tested using a survey of 1000 individuals in Japan, each of whom was asked a set of questions relating to their well-being (e.g., Fig. 5). Preliminary results suggest high importance of good social relationships for well-being and freedom of choice among those people who self-identified as having high connections with the ocean.

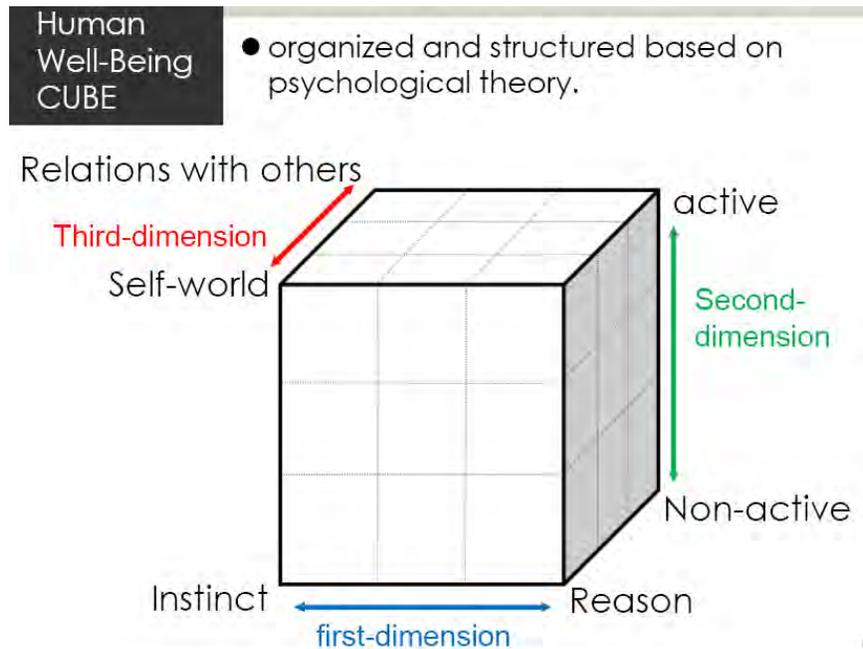


Fig. 3 Conceptual axes for the human well-being cube (from presentation by Hori and Makino at the second Project Science Team meeting, June 2013).

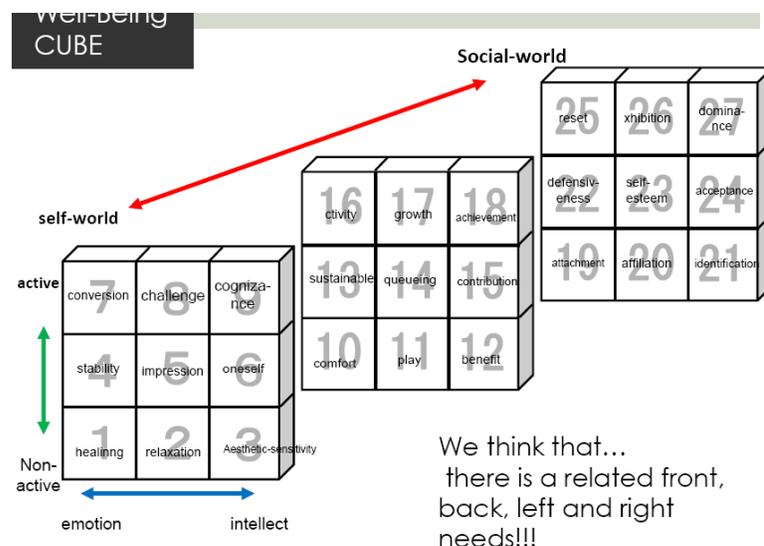


Fig. 4 Components of the 27 cells created within the human well-being cube (from presentation by Hori and Makino at the second Project Science Team meeting, June 2013).

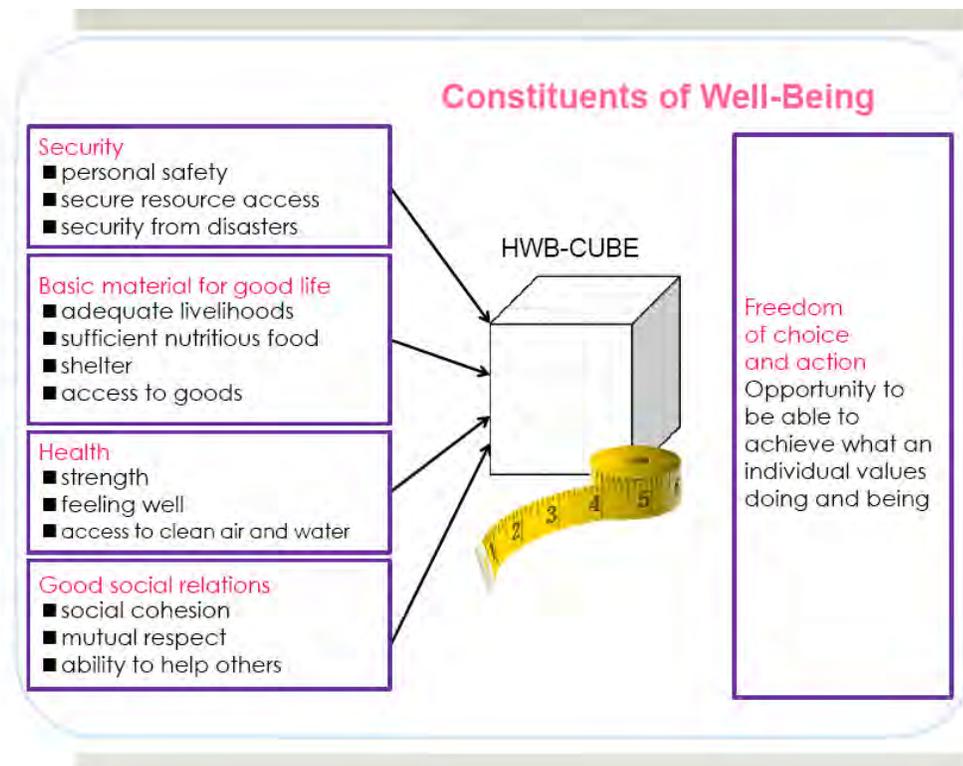


Fig.5 Relationships among the defined components of human well-being, the HWB cube, and freedom of choice and action (from presentation by Hori and Makino at the second Project Science Team meeting, June 2013).

DAY 2 – JUNE 11, 2013

The second day of the meeting was devoted to presentations and discussions of future project activities, plans, and budgets.

Indonesia Case Study

The follow-up activities for the Indonesian case study were proposed as:

1. Pond experiment and capacity-building training (leads: Drs. Wells and Makino),
2. Community research surveys and human well-being (leads: Drs. Hirota and Makino),
3. Capacity building – proposal by Dr. Susanna Nurdjaman, Institute of Technology, Bandung (who is a former student of Professor Yanagi),
4. Second Indonesia workshop.

Dr. Nurdjaman has submitted a proposal for \$5000 US to conduct research related to the project. Dr. Makino has requested that she contact Prof. Sachoemar to determine how her research will be coordinated with BPPT and PICES activities (at present there appears to be little connection between what she proposes and the experimental pond work), for example, will her group do modeling or will they actually set up the pond and maintain it? It was recommended that the advantage of the proposal at this time would be in modelling some of the initial conditions, for example the number of other species to stock, *etc.*

ACTION: The Project Science Team is generally in favour of this proposal but recommended a limit of \$5000 US per year for 3 years; the proponent needs to be contacted to improve the details of the work that would be done and how it integrates with this project. Lead: Dr. Makino.

It was suggested in discussion that activities in 2013–2014 be focused on development of the pond experiments in Karawang (West Java), with the workshop being held in late 2014 or 2015 to discuss and disseminate the initial results. A training course could be conducted at the start of the pond experiments. This would best be done in February or March of 2014 because this is good timing for the shrimp and fish farmers, and BPPT obtains its funding in January. It is expected that 3-4 Project Science Team members would participate in this training workshop and pond experimental set-up. It was noted that, because of the limited budget for this project, most of the funding would need to come from BPPT (*e.g.*, for the purchase of supplies, in-kind labour, *etc.*). Alternative scenarios should be developed in case their funding is insufficient for all the planned activities.

Discussions then turned to how will the social sciences fit in to the pond study, considering the focus of this PICES project on marine ecosystems and human well-being? A “social” baseline is needed before conducting the pond experiments to provide a comparison to evaluate whether the increased productivity of the ponds plus improved environmental conditions in the vicinity of the ponds have benefitted the local community, or whether the benefits have been shifted outside the local community (*e.g.*, to international markets). Are the additional products from such an integrated multi-trophic aquaculture activity distributed locally to improve human well-being, and how does this compare with shrimp-only facilities? Originally, Dr. Hirota had plans to survey in Indonesia 2-3 times, but this may need to be revised considering the recent budget reductions. The desire is to predict change in profit in the country due to multi-trophic aquaculture. Ideally the surveys would be focused on the multi-trophic aquaculture system: what happens to the products, and how the markets change, ultimately with a recommendation provided to the government regarding how to establish multi-trophic aquaculture in these environments. It was noted that it may take time (*e.g.*, more than 1 year) for the social benefits of such an integrated multi-trophic aquaculture enterprise to become fully evident. A comparative approach to the surveys was suggested, for example, using the site with the integrated multi-trophic aquaculture (IMTA) experimental ponds and another site with only shrimp aquaculture. The focus would then be on the distribution of any additional benefits from the IMTA products and their social benefits.

Dr. Hirota presented a template of the survey planned for Indonesia. This survey includes national, regional industry and fishing community level questions. It was noted that the survey questions must be developed and presented in a context familiar to and understood by the local people. In addition, it was suggested that Dr. Noer Kasanah (Department of Fisheries, Faculty of Agriculture, Universitas Gadjah Mada, Yogyakarta) might be able to help conduct these social surveys, using her students; consider inviting Dr. Kasanah to the Karawang training activity.

ACTION: Drs. Makino and Hirota need to discuss the approach and locations for the social surveys with BPPT and to develop options (of how, where, *etc.*).

The second Indonesia workshop would draw together the results from the IMTA pond experiments and promote expansion of the concept to other areas of Indonesia. It was recommended to defer this workshop to *Year 3* (2014–2015). There is interest on the part of BPPT of having this workshop in a different location, for example South Sulawesi, to illustrate and promote the results of this activity beyond Karawang. However, at present there does not seem to be an obvious contact in South Sulawesi. The training workshop (suggested for early 2014) could be a possibility to scout for opportunities and contact in South Sulawesi, who might be invited to the training workshop.

Guatemala Case Study

Vera Trainer presented options for the case study in Guatemala. She first briefly reviewed the activities relating to monitoring for harmful algal blooms that was part of the previous PICES/MAFF project, and then proposed the following:

Project #1 possibility – Ecosystem approach to shrimp aquaculture

- nutrient-laden water being pumped into coastline (tourist areas),
- interest in making shrimp farms environmentally sustainable,
- enhance coordination among farms,
- interest in export.

Project #2 possibility – Marine finfish aquaculture

- strong interest in Guatemala,
- efforts have failed to date because of lack of efforts to grow from fingerlings,
- University of Guatemala interest,
- a key objective would be to get fishermen involved in aquaculture – common wholesaler, better price,
- potential fish species: gar (“ugly” fish, lack of market interest) and tilapia (current prices are not good).

The need for a site visit, possibly in January 2014, was noted, likely using Dr. Leonel Carrillo Ovalle (Universidad de San Carlos de Guatemala) as an initial local contact considering the excellent relationships that have developed from the previous PICES/MAFF project. In discussion, the Project Science Team expressed a preference for the Project #1 option (shrimp aquaculture issues) as it appeared to match better the plans that are being developed for Indonesia. A Guatemala case study could be developed around issues of improving coastal water quality around shrimp farms, and the opportunities to use integrated multi-trophic aquaculture products for local consumption.

The following needs were identified:

- social scientist link – for example, Dr. Charles Trick has extensive experience in social science studies in developing nations and is interested in participating in the PICES-MAFF Guatemala effort;
- locations of coastal shrimp farms;
- determine target sites for a preliminary visit;
- determine budget:
 - will any supplies be needed?
 - travel for Guatemalan scientists,
 - translation assistance?

The proposal is for an initial scouting visit in January 2014, followed by a workshop later in the year. Discussion also noted an opportunity for the “people” side and the human well-being aspects to be related to advancing the resilience of local communities and peoples. Dr. McKinnell pointed out that there may be an existing project from Spain working on aquaculture training in Guatemala – this needs further research and possibly discussion with local colleagues.

The following were identified as questions to consider in developing the Guatemala case study:

- Are they most interested in the shrimp aquaculture vs. aquacultured fish project?
- Would Acuamaya be interested in collaborating in a multi-trophic experiment? Or any other shrimp farmers would be interested? Would this be an interesting University research project?
- Would we be able to visit them last week of January and discuss this project?
- Would government, university, local farmers be interested in the multi-trophic aquaculture issue?
- Are Tilapia is consumed domestically and shrimp is exported? Is production of Tilapia economically feasible?
- What are the production amounts and values for shrimp and Tilapia for last several years?
- What are the kinds of products (filet or whole, frozen or fresh)?
- What are the number of processing plants and their scale?
- What is the local use of seafood vs. what is exported?
- What could be grown for local consumption? Bivalves, seaweed, *etc.* What would the local people eat?
- Where are the shrimp aquaculture facilities in Guatemala?
- Where/who are the distributors?
- Questionnaires for well being survey – would minimum 1000 surveys be possible?
- What is reasonable reimbursement for 30 min survey in: a. Guatemala City (minimum 500) and b. coast (Monterrico) (minimum 500)

ACTION: Dr. Trainer to work over the summer 2013 to develop the opportunities and identify issues relating to the Guatemala case study, and to report and provide recommendations for decision at the October 2013 meeting of Project Science Team.

Well-being “Cube” Further Activities

Activities regarding the well-being “cube” project over the next year were discussed. The survey in Japan was conducted in 2012. The next countries to be surveyed (to start in July 2013) are Korea and the United States. It was recommended that, to improve the results with respect to the well-being of people connected in some way to the ocean, to focus these surveys on locations closer to the ocean (*e.g.*, the five US states along the Pacific coast) rather than nationwide. Dr. Suam Kim asked for the survey questions to be circulated to the Project Science Team once they have been translated into English and Korean. Surveys in 2014 could consider Indonesia and Guatemala to converge with the IMTA experiments, although it was noted that different methods may be needed because of lack of internet access.

ACTION: Dr. Hori to circulate well-being “cube” survey questions to Project Science Team members once they are available in English and Korean.

Database Activity

Production of a database from this project is one of the deliverables to MAFF. The Project Science Team discussed what form this database might take, considering how the project is evolving. The database could:

- be a bibliography, for example of publications relating to marine ecosystems and human well-being, Sato-umi, Gempita, and related concepts;
- link with data from previous PICES/MAFF projects;
- store the individual responses from the well-being “cube” surveys;
- store the techniques and tools, and results, developed from the Indonesia and Guatemala case studies and their manuals.

Palau Case Study

Considering the expected budget reductions (see below) one option is to cancel the Palau case study. Another option is to keep it ‘in reserve’ in case one of the leading projects (Indonesia, Guatemala) does not work out. It was recommended to retain the option of conducting a Palau case study but at the moment provide a null budget, and to make clear in the reporting to PICES and to MAFF that it may not be continued depending on the future budget situation.

DAY 3 – JUNE 12, 2013**Budget**

The current budget situation was discussed, including the impacts of the current and expected future budget reductions. The 2013–2014 draft planning budget is presented in Table below.

Draft 2013–2014 project budget, including expenses rolled over from 2012-2013.

Category	Itemisation	Allocation	Allocation totals
Travel & Meetings			
	Honolulu SSC meeting	est. 6000	13000
	Nanaimo SSC meeting	10000	10000
	Indonesia Training workshop & pond expt setup: 5 people x 8 nights (avg \$100/d)	4000	
	Flights (\$2500*5)	12500	
	Flights internal (\$200 x 3 people)	600	
	Noer University/social participation in training workshop	500	
	Total PICES \$17100	20000	
	Local expenses \$10000	10000	
	Social survey scoping meeting (Hirota-san) : flight: \$1000; \$100 per diem for 4 nights	1500	
	Social survey (Hirota-san + 2) : flight: \$1000x3; \$100x3 per diem for 8 nights (to take place concurrent with Training workshop)	6000	
	Social survey BPPT/local expenses	1000	
	TOTAL for Training workshop, pond expt, social survey		40000
	"Extra" Indonesia travel support		3000
	Guatemala: Scoping meeting		
	US scientist	2200	
	Cdn scientist	2300	
	Jpn scientists	3300	
	Guatemalan Scientist	400	
	Guatemala: Scoping meeting (3 scientists)		9000
	TOTALS		15000
	"Extra" Guatemala travel support		1500
Contracts			
	"Susanna" contract (Indonesian model)	5000	5000
	PICES Secretarial support (additional)	10000?	15000
	Well-being Cube survey (already paid)	17000	17000
	Translate "cube" survey from English to Spanish, and conduct survey in Guatemala	5000	5000
Equipment			
	PICES computer upgrades/Training equipment	15000	15000
Miscellaneous			
	Carry-over from FY12/13	1503	1500
PICES overhead		15000	15000
TOTAL			135,000
Total available			135,000

Other Issues

Web page

This PICES/MAFF project needs to develop its project page on the PICES web site. Materials are needed from the Project Science Team to populate this page.

ACTION: ALL – to provide materials for the project page on the PICES web site.

Project name

A more convenient name for the project is needed. Suggestions to date include:

- POWER: People and Ocean Wellness, and Ecosystem Response
- Ecopond
- MarWeB

Other suggestions are needed.

ACTION: ALL – to suggest short names for this project, or to express their preference for existing recommendations.

Session proposal for PICES 2014 Annual Meeting

With the evolution of the project towards a focus on integrated multi-trophic aquaculture, it would be beneficial for the project to sponsor a scientific session at the PICES Annual Meeting in 2014 (to be held in Korea) that would present scientific issues and opportunities relating to his topic, in particular with a focus on developing countries in the lower latitudes. The deadline for session proposals is in early September 2013.

ACTION: Drs. Makino and Perry to lead development of a session proposal on integrated multi-trophic aquaculture (with a focus on developing countries) for submission in September 2013.

Project Science Team membership review

With the evolution of a focus for the project on integrated multi-trophic aquaculture, it is timely to conduct a review of the membership of the Project Science Team, to see if there is needed expertise currently not on the Team, and if any Team members might wish to step off. For example, it was suggested that an expert on multi-trophic aquaculture, in particular with developing country experience, would be an asset on this Team.

ACTION: ALL – to express whether they wish to remain on the Project Science Team and are interested to participate in the current activities as they are presently evolving.

Next Project Science Team meeting

Items for the agenda for the next meeting of this Steering Committee were identified as:

- Report from Dr. Trainer on discussions and development of the project in Guatemala;
- Update on plans for the Indonesia case study and pond experiments (Makino, Hirota, Wells);
- Early results from the analyses of the well-being “cube” surveys in Japan, USA, Korea (Hori, Makino);
- Report on the Japanese visit to Palau (Makino, Hirota, Hori);
- Decision needed on the use of project funds to support computer upgrades in the Secretariat;
- Develop a project timeline (meetings, field visits, field programs, *etc.*).

Recommendations/Action Items

- Our project should maintain contact with the International Sustainability Unit (ISU) of the UK Prince Charles' Charitable Foundation to see what collaboration may be possible.
- Propose integration with aquaculture group and its role in promoting human well-being (Topic Session at the PICES Annual meeting in Korea?)
- Report has general background on Sato-umi, then 2 case studies (Indonesia case study, then Guatemala case study). We may need manuals targeted for different audiences with different levels of specificity.
- Drs. Kim and Makino suggest that we could also develop a brochure for the general public.
- Publication in the scientific literature regarding multitrophic aquaculture, especially if there is commonality between Indonesia and Guatemala (possibly in the journal *Ecology and Society*, Dr. Perry is an editor).
- Modify questions for well-being “cube” analysis to make more understandable in developing nation without changing content (Drs. Hori, Makino, Trainer and Wells).
- Provide well-being survey to show to Indonesian and Guatemalan collaborators (July 1, English version sent by Dr. Hori to Drs. Makino, Trainer and Wells) – include sending the Korean version to Dr. Kim.
- Social survey logistics to be discussed (Drs. Makino, Hirota and Wells) with BPPT collaborators and Dr. Kasanah at University Gadjah Mada (Dr. Hirota) and Leonel in Guatemala (Dr. Trainer).
- Contact Indonesia (Prof. Sachoemar) about their commitment to providing in-kind support for the experimental ponds (Drs. Makino and Wells).
- Development with Prof. Sachoemar of an agreement on research cooperation, possibly over next year (Drs. Makino and Wells).
- Contact Dr. Nurdjaman to determine what is covered in her proposal. What will she be able to contribute to the overall PICES/MAFF project. Is the \$5000 an annual cost? What is included in this? (Dr. Makino).
- Find an expert in multi-trophic aquaculture to add to the Project Science Team (Drs. Wells and Makino).
- Explore a contact in South Sulawesi during *Year 2* for planning purposes for a second workshop in *Year 3* (Dr. Wells).
- Contact Guatemala with ‘general’ questions regarding this project (Dr. Trainer).
- Reporting: Co-chairs to prepare reports for PICES (and MAFF) on project development and activities, 2012–2013 and 2013–2014 budgets – DUE “NOW”.
- Development of session/workshop proposal for PICES 2014 (Drs. Perry and Makino).
- More information/clarification needed on additional contributions from the Secretariat to the project, in terms of financial requirements (Drs. Makino and Perry).

Appendix 1

Meeting participants



Participants of the second Project Science Team meeting for the PICES/MAFF project on “*Marine ecosystem health and human well-being*”. Left to right: Suam Kim (Korea), Skip McKinnell (PICES), Ian Perry (Canada), Mitsutaku Makino (Japan), Vera Trainer (USA), Mark Wells (USA), Juri Hori (Japan) Thomas Therriault (Canada), and Masahito Hirota (Japan).

Appendix 2

Second Project Science Team meeting agenda

Dates: June 10–12, 2013

Venue: Hawaii Prince Hotel Waikiki, Honolulu, Hawaii, USA

Meeting objectives:

- to review activities and accomplishments of the project to date
- to prepare the content of the annual report to MAFF
- to plan activities for remainder of 2013-14 and future years

Timetable (Names in brackets are the intended discussion leaders):

Day 1 (June 10) “Accomplishments to date” 0900-1700

1. Welcome and adoption of the agenda (PIs)
2. Introduction of the project and goals for this meeting (PIs)

As defined in the Project Proposal: The goal of this PICES project on “*Marine ecosystem health and human well-being*” is to identify the relationships between sustainable human communities and sustainable marine ecosystems in the North Pacific, under the concept of fishery social-ecological systems. Specifically, considering the global changes in climate and human social and economic conditions, determine:

- a) how do marine ecosystems support human well-being; and
 - b) how do human communities support sustainable and productive marine ecosystems.
3. Progress reports and discussion on activities to date:
 - Prince’s Trust meeting (Makino-san for Kaneko-san)
 - Follow-ups from Project Science Team meeting at PICES-2012 (see Background Item #1a and 1b) (PIs)
 - Results of the two Indonesia Workshops:
 - Scoping meeting, January 22-23, 2013 (Makino-san, Hirota-san)
 - 1st Workshop, March 13-14, 2013 (Makino-san, Hirota-san, Wells-san)
 - Reports and discussion should review accomplishments, what worked well, what did not work well, next steps, recommendations
 - ‘Well-being Cube’ analyses (Hori-san, Makino-san)
 4. Key outcomes from first year activities, and Lessons Learned (All)
 5. Discussion of elements of Report to MAFF (and PICES) on first year activities

Day 2 (June 11) “Future plans” 0900-1700

6. Current budget position, and budget reduction issues (PIs, Secretariat)
 - our project has received a ~20% reduction for 2013-2014 from MAFF
 - our project may receive additional reductions for 2014-15 from MAFF
 - in today’s discussions, we must consider the reduced budget for 2013-14 and two scenarios for 2014-15:
 - 1) similar budget as 2013-14;
 - 2) additional large reduction in 2014-15
7. Follow-up activities for the Indonesia project (leads: Makino-san, Hirota-san)
8. Plans for the Guatemala activities (Trainer-san, Wells-san)
9. Plans for activities in Palau (Makino-san)
 - note our original proposal was for work in Palau to begin in Year 3
10. Database development project (leads: Makino-san, Hirota-san)
11. Development of the Manual on “*Marine ecosystem health and human well-being*” / Sato-Umi systems (leads: Makino-san, Hirota-san)
12. Review budget items for 2013-14, and tentative items for 2014-15, and elements for budget report to MAFF for 2013-14 (All)

Day 3 (June 12) “General issues and collaborations” 0900-1300

13. UN 1st World Ocean Assessment and PICES Workshop (Therriault, Perry)
14. Potential intersections/synergies with WG-28, S-HD, and other groups within the FUTURE Program and PICES broadly (Perry)
15. Recap of overall project objectives and goals in light of current and planned activities (All)
16. “Name” for our project (Perry)
17. Any other issues
18. Concluding remarks (Makino-san, Perry)

Attachments:

- 1a. Detailed report of First Project Science Team Meeting, Hiroshima, October 11, 2012
- 1b. Summary report of First Project Science Team Meeting as published in 2013 PICES Annual Report
2. Letter of Intent between PICES and BPPT Indonesia re project
3. Formal summary of First Indonesia workshop, March 13-14, 2013
4. Report for PICES on Indonesia workshop, March 13-14, 2013
5. Article on Satoyama and Satoumi published in IHDP Dimensions magazine
6. Brochure of key findings and recommendations from Japan Satoyama and Satoumi assessment (2011)

Appendix 3**Draft Agenda and meeting report from the First Indonesia Workshop**

Agency for the Assessment and Application
of Technology



North Pacific Marine Science Organization



Fisheries Research Agency of Japan

DRAFT AGENDA
INTERNATIONAL WORKSHOP ON SATO UMI-GEMPITA SPL-GAPURA
(A New Concept and Model for Sustainable Fisheries, Aquaculture and Coastal Management)
Jakarta, March 13-14, 2013

March, 13: First Commission Room BPPT Bld. II 3rd Fl -JL. M.H. Thamrin No. 8 Jakarta 10340

Schedule	Agenda	Speaker
08.30-09.00	Registration	
09.00-09.05	Opening	MC
09.05-09.15	Report and welcome remarks	Director of Centre for Agriculture Production Technology-BPPT
09.15-09.25	Welcome Remark	Deputy Chairman for Biotechnology and Agroindustry Technology-BPPT
09.25-09.45	Opening Remark and introduction of the workshop	M. Makino (FRA-Japan)
09.45-10.15	Keynote Speech of Sato Umi	Prof. T. Yanagi (Kyushu University)
10.15-10.25	Keynote Address and Opening Workshop	Chairman of BPPT
10.25-10.45	MOU, Group photos, Press Release etc.	
10.45-11.00	Coffee Break	
Session 1		
Chairman		M. Husni Amarullah (BPPT)
11.00-11.15	Harmonization between local wisdom and new technology on the fisheries and coastal management.	Anthropologist (University) will be decided
11.15-11.30	Coastal restoration and rehabilitation programme to support aquaculture development in Indonesia	Director General for Marine Coastal and Small Islands, Ministry of Marine Affairs and Fisheries -INA
11.30-11.45	Aquaculture Development in the Coastal Area	Director General of Aquaculture- Ministry of Marine Affairs and Fisheries -INA
11.45-12.00	Infrastructure Support in the Coastal Area	Director General of Water Resources, Ministry of Public Works-INA
12.00-12.20	Discussion	
12.20-13.00	LUNCH BREAK	
Session 2		
Chairman		Prof. T. Yanagi-Kyushu University
13.00-13.20	Sato Umi, GEMPITA-SPL/SFiCOM- GAPURA Programme in Indonesia	Suhendar I Sachoemar (BPPT,INA)
13.20-13.40	Past PICES's activities Supporting GEMPITA-SPL-SFiCOM and GAPURA in Indonesia	Vera Trainer (NOAA, USA), Mark Wells (Maine System Univ., USA), Charlie Trick (Western Univ., Canada)
13.40-14.00	Well-being analysis for Sato-Umi in Indonesia	Masahito Hirota (FRA, Japan)
14.00-14.20	Ecosystem Modeling of Brackishwater pond	Susanna Nurjaman (Bandung Institute of Technology, INA)

2nd PICES MAFF-sponsored project meeting

14.20-15.00	Discussion	
15.00-15.30	Coffee Break*	
Session 3		
Chairman		Suhendar I Sachoemar (BPPT)
15.30-15.45	Status and Problem of the Coastal and Fisheries Resources Management of West Java Province	Head of the Department of Marine and Fisheries in West Java Province
15.45-16.00	Status and Problem of the Coastal and Fisheries Resources Management of Bantaeng Region-South Sulawesi Province	Regent of Bantaeng – South Sulawesi Province
16.00-16.15	Status and Problem of the Coastal and Fisheries Resources Management of Tanah Bumbu Region–South Kalimantan Province	Regent of Tanah Bumbu – South Kalimantan Province
16.15-17.30	General Discussion, Summary and Action Plan Launch of Sato Umi Activities	M. Makino (FRA-Japan) Suhendar I Sachoemar (BPPT), Prof. T. Yanagi (Kyushu University), M. Husni Amarullah (BPPT)
17.30-17.45	Closing	MC
18.30-21.00	Dinner	

*Special meeting for the leader of local government (West Java, Bantaeng, Tanah Bumbu)

March, 15 : Field Trip to Karawang (Center for Brackishwater Aquaculture)

Schedule	Agenda	Speaker
06.30-09.30	Heading to Karawang	OC and Participant
Chairman		M. Husni Amarullah (BPPT)
09.30-09.45	Welcome Address	Head of Center for Brackishwater Aquaculture
09.45-11.15	Field Trip at Center for Breackishwater Aquaculture	Head of Center for Brackishwater Aquaculture
11.15-11.30	Heading to Center for Breackishwater and Marine Culture of West Java Province - Karawang	OC and Participant
Chairman		Suhendar I Sachoemar (BPPT)
11.30-11.45	Welcome Address	Head of Center for Brackishwater and Marine Culture of West Java Province - Karawang
11.45-13.15	Field Trip at Center for Brackishwater and Marine Culture of West Java Province - Karawang	OC and Participant
13.15-14.15	LUNCH BREAK	
14.15-16.45	Discussion with local leader of the northern coastal area of west Java communities, Summary and Action Plan Launch of Sato Umi Activities	M. Makino (FRA-Japan) Suhendar I Sachoemar (BPPT), Prof. T. Yanagi (Kyushu University)
16.45-17.00	Closing	
17.00	Return to Jakarta	OC and Participant

March 12: Preliminary meeting at Sari Pan Pacific Hotel 08.00 pm.

March 14: Wrap up meeting on the Bus 17.00-20.00

March 15: Wrap up meeting at BPPT in 01.00 pm

Report of the International Workshop Organized by PICES/MAFF Project on “Marine Ecosystem Health and Human Well-Being”

1. BACKGROUND

In 2012, PICES started a project “*Marine ecosystem health and human well-being*” which is funded by the Ministry of Agriculture Forestry and Fisheries of Japan (MAFF) for 5 years (April 1, 2012 – March 31, 2017). The overall goal of the project is to identify the relationships between sustainable human communities and productive marine ecosystems in the North Pacific under the concept of fishery social–ecological systems. In Japan, this concept attracts attention as the “*Sato-umi*” fisheries management system. Specifically, considering the global changes in climate and human social and economic conditions, it aims to determine: a) How do marine ecosystems support human well-being? and b) How do human communities support sustainable and productive marine ecosystems? The principal investigators of this project are Dr. Mitsutaku Makino (Japan) and Dr. Ian Perry (Canada) whose activities are supported and consulted by the project’s Science Team.

Based on the decisions made at the 1st Project Science Team meeting on October 11, 2012, in Hiroshima, Japan, the PICES-MAFF project would involve holding two workshops in in developing countries in three regions of the North Pacific (Southeast Asia, Pacific oceanic islands, and Central America). Indonesia was selected because of its large population and aquaculture-intensive industry. Palau was chosen because of its focus on the finfish capture fishery and its existing networks of community-based fisheries). Guatemala was selected because its coastline features an upwelling system favourable for the finfish fishery and aquaculture). This report is on the first workshop held March 13–14, 2013, in Jakarta, Indonesia.

2. GEMPITA-SPL CONCEPT IN INDONESIA

The Indonesian Agency for the Assessment and Application of Technology (BPPT) has developed a concept of managing coastal and marine resources in a balanced, harmonious, integrated and productive environment by actively involving the community. This Indonesian concept is called GEMPITA-SPL (Gerakkan Masyarakat Peduli Kelestarian Sumberdaya Perikanan, Pesisir dan Laut) or, in the English language version, as SFiCoMS (Sustainable Utilization of Fisheries, Coastal and Marine Resources for the Society). The GEMPITA-SPL or SFiCoMS concept has been implemented in the northern coastal area of Java Development Activities in West Java (GAPURA) by BPPT and the local Department of Fisheries and Marine Affairs through the development and promotion of environmentally friendly aquaculture technology called Integrated Multi-Trophic Aquaculture (IMTA). This approach features concepts of bio-recycling in idle and/or marginal brackish water ponds of the northern coastal area of West Java. By applying this concept, the coastal environment which has been heavily damaged by shrimp monoculture can be recovered to become more biodiverse and productive, leading to a balanced and harmonious way to improve the welfare of local communities. The GEMPITA-SPL concept fits very well within the framework of fishery social-ecological systems in the PICES/MAFF Project.

3. OUTLINE OF THE WORKSHOP

The first PICES/MAFF project workshop, was held in March 13–14, 2013, in Jakarta, Indonesia. The workshop was attended by 93 participants from Indonesia, Japan, and the USA. Indonesia was represented by the Ministry of Marine Affairs and Fisheries, Ministry of Research and Technology, Ministry of Environment, Ministry of Public Works, Coordinating Ministry for the Economy, Finance and Industry, Coordinating Ministry for People’s Welfare, Ministry of Development of Disadvantaged Areas, Ministry for National Development Planning, Food Security Agency of the Ministry of Agriculture, Bandung Institute of Technology, Bogor Agriculture University, and local governments.

The objectives of the workshop were:

- 1) To develop the contents of a manual that will describe GEMPITA-SPL/SFiCoMS and GAPURA experiences in Java Province according to local conditions at some candidate sites.
- 2) To assess the utility of PICES' scientific tools for enhancing the human well-being of local communities and for rehabilitating coastal ecosystem at some candidate sites.

The first day of the workshop was spent at the Main Commission Hall of BPPT's Headquarters in Jakarta. It was started with a welcome by Ms. Nenie Yustiningsih (Director of the Center for Agricultural Production Technology of BPPT), followed by opening remarks and introduction by Dr. Makino (Fig. 1). The keynote speech was made by Professor Tetsuo Yanagi from Kyushu University, Japan. The opening of the workshop was formally announced by Dr. Listyani Wijayanti (Deputy Chairman of BPPT). A total of 10 presentations were given on the first day. Dr. Mark Wells (University of Maine, USA; Fig. 2) described previous activities of PICES in Indonesia and suggested ways that PICES science can support GEMPITA-SPL. Dr. Masahito Hirota (National Research Institute of Fisheries Science, Fisheries Research Agency, Japan) talked about how PICES scientific tools can support the analysis of well-being in coastal societies.



Fig. 1 Dr. Mitsutaku Makino giving opening remarks and introduction at the workshop.



Fig. 2 Panel discussion including participation by Drs. Masahito Hirota (far left) and Mark Wells (center).

The second day featured a field trip to the Karawan area of West Java where BPPT has developed GEMPITA-SPL (Fig. 3). Participants visited Center for Brackishwater and Marine Culture of West Java Province and the National Center for Brackishwater Aquaculture to observe aquaculture ponds that applied the GEMPITA-SPL approach, and had discussions with local stakeholders (fishers, managers, *etc.*).

The workshop attracted serious attention from the Indonesian media, with many reports appearing in newspapers, on TV and internet news (Fig. 4).



Fig. 3 Field trip to the West Java area.

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WORKSHOP SATO-UMI - GEMPITA
Aquaculture and Sustainable

Badan Pengkajian dan Penerapan Teknologi (BPPT) bekerjasama North Pacific Marine Science Organization (PICES), Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF) dan Fisheries Research Agency of Japan (FRA) akan mengembangkan suatu konsep baru SATO-UMI.

Ini merupakan gerakan pembangunan, pengelolaan dan pemanfaatan sumberdaya perikanan, pesisir dan kelautan secara bijaksana, seimbang dan harmonis, terintegrasi dan lebih produktif.

Kegiatan tersebut akan melibatkan masyarakat secara aktif dalam konsep Gerakan Masyarakat Peduli Barat (GAPURA).

Jadi SATO-UMI tersebut pendekatannya ada tiga yaitu masalah sosial, teknologi, dan kelestarian sumber daya. Intinya mengawinkan teknologi kearifan lokal, sosial dan ekonomi, ungkapnya.

Menurutnya, konsep SATO-UMI, selain di Jepang sendiri juga sudah diterapkan di Guatemala, Filipina, dan selanjutnya akan diterapkan di Indonesia. Kalau di Indonesia, SATO-UMI pendekatannya melalui budidaya dengan melibatkan masyarakat.

M. Makino dari FRA-Japan, dalam kesempatan tersebut juga menggambarkan keuntungan penggunaan konsep SATO-UMI tersebut. Menurutnya manfaat SATO-UMI tidak hanya dari sisi perikanan saja tetapi juga dari unsur-unsur lain seperti pelestarian lingkungan, selain itu juga dapat ditanami rumput laut, sehingga akan meningkatkan pendapatan masyarakat, termasuk industri-industri di sekitarnya.

(*redaksi@wartaekonomi.com)

"Konsep baru pengelolaan sumberdaya perikanan ini dibuat seramah mungkin terhadap lingkungan," kata Deputy Kepala BPPT Bidang Agroindustri dan Bioteknologi, Listyani Wijayanti pada acara International Workshop SATO UMI-GEMPITA SLP-GAPURA yang diselenggarakan di BPPT Jakarta, Rabu (13/3).

Fig. 4 Media report about the LOI signing ceremony by Dr. Makino and Dr. Listyani (BPPT Vice Chairman).

4. THE MAIN OUTPUTS FROM THE WORKSHOP AND THE NEXT STEPS OF THE PICES/MAFF PROJECT

Many important outputs have come from the workshop (March 13–14) and from discussions held the next day (March 15). The first output was a Letter of Intent (LOI; Appendix 1) between PICES and BPPT to recognize the benefits to their respective institutions of establishing an international link (Fig. 4). The second output was a draft list of parameters to assess GEMPITA-SPL performance (Table 1). In close coordination with Indonesian scientists, PICES scientists will support the assessment of these parameters in sample ponds where GEMPITA-SPL has been implemented. A third output was a table of contents developed for a GEMPITA-SPL manual to facilitate the dissemination of GEMPITA-SPL activities in Indonesia (Table 2). These main outputs will be discussed at the second meeting of the Project Science Team to be held June 11–12, 2013, in Honolulu. Based on the advice and comments from this meeting, the second workshop will be held around March 2014.

In addition to this Indonesian study, the PICES/MAFF Project will study a case in Guatemala in 2013, and in Palau in 2014. A progress report on these areas will be reported soon.

Table 1 Draft list of parameters to assess the performance of GEMPITA-SPL.

Aquaculture production parameter	Marine Ecosystem parameter	Social system parameters
1. Production (Number of species, Kg, Value). We have statistics.	1. Dissolved Oxygen	1. Number of employment (farmer, processors, distributors, retailers)
2. Quality of aquaculture products: changes in size, and weight.	2. Nutrient concentrations, chemical species, and ratios; Nitrate/nitrite and ammonium. P, Si	2. Multiple (synergy) effects (distribution, value chain, etc.)
3. Costs of Production: costs for feeds, seeds, labor, operation costs.	3. Water transparency	3. Added values (production, processing, distribution)
4. Disease: shrimp-virus (see 2-7), # of dead. Fish-bacteria/pathogen (pending) Shellfish-toxins (pending)	4. Phytoplankton abundance, and species composition	4. Social Infrastructure (hospital, Health care, disaster protection (evacuation plan, hazard map), Information system (IT), etc.)
5. Recovery of non-used ponds we can try	5. Bacteria abundance	5. Industrial Infrastructure (fish Market and Supply chain)
6. Other parameters?: origin of the seeds.	6. Virus abundance	6. Education system (Technical skill, food security, processing, etc.)
	7. Sediment quality Pre-ASV, Post-ASV (Ion selective electrode)	7. Average/range of Income (farmer, processors, distributors, retailers)
	8. Temperature and salinity	

Table 2 The contents of GEMPITA-SPL Manual (Ver. 1)

Executive Summary

1. Introduction for the concept of GEMPITA-SPL
 - S1 Concept of Sato-umi (by Prof. Yanagi)
 - S2 Concept of Gempita (by Dr. Suhendar)
2. Why we need Gempita (the expected outcome from Gempita to ecosystem and community)
 - S1 Ecological system perspective
 - S2 Social system perspective
3. How to introduce Gempita (technical how-to)
4. How to assess the effectiveness of Gempita (scientific assessment how-to)
5. Conclusion
 - Glossary



Agency for the Assessment and
Application of Technology



North Pacific Marine Science Organization

LETTER OF INTENT

Between

**AGENCY FOR THE ASSESSMENT AND APPLICATION OF TECHNOLOGY
(BADAN PENGKAJIAN DAN PENERAPAN TEKNOLOGI / BPPT)**

And

North Pacific Marine Science Organization (PICES)

Concerning

**THE DISSEMINATION OF “SATO-UMI” GEMPITA-SPL/SFiCoMSCONCEPT
IN INDONESIA**

1. The Agency for the Assessment and Application of Technology (Badan Pengkajian dan Penerapan Teknologi/BPPT) and the North Pacific Marine Science Organization (PICES), hereinafter referred to as the “Parties”, enter into this Letter of Intent (LOI) by recognizing the benefits to their respective institutions from the establishment of international links.
2. In the spirit of better and responsible management of global earth resources utilization, and in order to enhance the economic situation of the people and the region’s sustainability, through *wisdom harmonization of science and technology – natural resources and environment – humans*, which is getting urgent to implement in Indonesia, BPPT and PICES agree to promote the dissemination of the “Sato-Umi” concept in Indonesia, through the PICES/MAFF Project on “*Marine Ecosystem Health and Human Wellbeing*”.
3. The LOI implementation will be followed by the preparation of an Agreement on Development Research Co-operation within 6 (six) months from the signing of the LOI.
4. The LOI shall be in effect until March 31, 2017, or otherwise terminated in writing with at least one month’s advance notice of the intention of termination by the Parties.

The LOI shall be executed in two (2) copies in English, both Parties will retain one copy each.

Jakarta, _____

(Signature)

(Name)

Deputy Chairman of BPPT
For Agroindustry and Biotechnology

(Signature)

(Name)

Representative of PICES

Alexander Bychkov
Executive Secretary

Mitsutaku Makino and Ian Perry
PI of the PICES/MAFF Project on
“Marine Ecosystem Health and Human Well being”



INTERNATIONAL WORKSHOP ON SATO-UMI – GEMPITA SPL – GAPURA IN INDONESIA

SUMMARY AND ACTION PLAN

1. The theme of International Workshop on SATO-UMI - GEMPITA SPL - GAPURA is "The Concepts and New Models of Fisheries Resource Management, Coastal and Marine Resources Sustainably" with main focus on aquaculture was held in Jakarta, Indonesia on March 13th, 2013. The workshop hosted by BPPT in collaboration with PICES (the North Pacific Marine Science Organization). Welcome Remarks of the workshop by Ir.Nenie Yustiningsih, M.Sc, the Director of Center for Agricultural Production Technology of BPPT, Opening Remarks and Workshop Explanations by Dr. Mitsutaku Makino from Fisheries Research Agency of Japan, Key Note Speech by Prof. Dr. Tetsuo Yanagi from Kyushu University, Japan and Opening Workshop by Dr. Listyani Wijayanti, the Deputy Chairman of BPPT for Agro-industry Technology and Biotechnology.
2. A signing Letter of Intend (LoI) is held between Dr. Listyani Wijayanti, Deputy Chairman of BPPT and Dr. Mitsutaku Makino, Secretary and PI of PICES on "Dissemination and Implementation of SATO-UMI - GEMPITA SPL - GAPURA concept in Indonesia," which will soon be followed by the signing of the Agreement on Development Research Cooperation.
3. The workshop is attended by 93 participants from Japan (Ministry of Agriculture, Forestry and Fisheries of Japan; Fisheries Research Agency of Japan, Kyushu University), the United States (University of Maine, San Fransisco State University, USAID), and from Indonesia i.e the Ministry of Marine Affairs and Fisheries, the Ministry of Research and Technology, LIPI, BPPT, Bandung Institute of Technology, Bogor Agriculture University, Ministry of Environment, Ministry of Public Works, Coordinating Ministry for the Economy, Finance and Industry, Coordinating Ministry for People's Welfare,

Ministry of Development of Disadvantaged Areas, Ministry for National Development Planning (Bappenas), Ministry of Cooperation and Small Medium Enterprise (UKM), Food Security Agency of the Ministry of Agriculture, Department of Fisheries and Marine Resources, local government from West Java Province, District of Anambas Riau Island Province, District of Bantaeng South Sulawesi Province, District of Tanah Bumbu South Kalimantan and participants of the Indonesian Aquaculture Society, Association of Fishpond Farmers in North Coast of Java. Institute of Aquaculture, Fisheries entrepreneurs, community leaders, the farmers and other relevant stakeholders. A total of 10 papers were presented and discussed in this workshop.

4. Outline Executive Summary and Action Plan of the workshop are as follows:

- 1) SATO-UMI is a concept of fisheries management in coastal and marine environment which will be implemented in a harmonious coexistence of nature and human-being in Indonesia. The SATO-UMI concept has harmonized with Indonesia Govt Law (UU) No 27 year of 2007.
- 2) It will be applied in various countries (Japan, Philippine, Guatemala, etc.) and the one is in Indonesia of which focusing in aquaculture.
- 3) Aquaculture is a main activity which supports the increase production of fisheries as well as economically important to coastal communities in Indonesia. For achieving responsible and sustainable aquaculture it should be required in a harmony of fish resources – technology – and human awareness especially supported by local wisdom.
- 4) A concept of human well being on Sato Umi (Gempita SPL) consists of: Harness, industrial operation, social infrastructure should be considered.
- 5) The Implementation SATO-UMI - GEMPITA SPL - GAPURA in Indonesia will be coordinated by BPPT. The scopes of the implementation activities include:
 - a) Harmonization, synchronization and integration of Indonesian Local Wisdoms and New Technologies in the Fisheries and Coastal Management
 - b) Assessment and application of technology related to SATO-UMI

- c) Model development of SATO-UMI implementation is to get higher productivity and biodiversity i.e shrimp polyculture with Tilapia, Seaweed, and Green Mussel in Karawang District, West Java
 - d) People Empowerment in the Coastal Area
 - e) Monitoring and evaluation of program activities
 - f) International Workshop and training
- 6) The SATO-UMI concept has been interested by some district regions in Indonesia such as 1) Karawang District of West Java Province, 2) Bantaeng District of South Sulawesi Province, 3) Anambas District of Riau Islands Province 4) Tanah Bumbu District of South Kalimantan Province, and 5) Pekalongan City of Central Java Province which have specific local problems for aquaculture.
5. This workshop will be followed by field visits (field trips) on March 14th, 2013 to sites in the Center for Brackishwater and Sea Water Aquaculture and in the Central Aquaculture Business Services under the Ministry of Marine Affairs and Fisheries located in Karawang District of West Java Province

Jakarta, March, 13th 2013

The Organizing Committee



Suhendar I. Sachoemar

The Agency for the Assessment
and Application of Technology



Mitsutaku Makino

The North Pacific Marine Science
Organization