



# Panel Discussion

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**Panel Chair:**

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**Speakers:**

**YAGI Nobuyuki**

The University of Tokyo

**Shakuntala Haraksingh Thilsted**

WorldFish

**MIYATA Tsutom**

JIRCAS

**SAKIYAMA Kazutaka**

FRA

**Jeffrey T. Wright**

University of Tasmania

**YURIMOTO Tatsuya**

JIRCAS

**MORIOKA Shinsuke**

University of Human Environments

**Jon P. Altamirano**

SEAFDEC/AQD



**Marcy N. WILDER:**

Thank you. Distinguished participants, thank you for your attendance today. We hope that you enjoyed today's presentations from our eight distinguished speakers. Briefly, to reiterate the goal of today's symposium, we at JIRCAS are determined to promote the further development of blue foods and contribute to the realization of the relevant SDGs. With this goal in mind, we have convened today's symposium to showcase how we can assist small scale artisanal fishers, fish farmers and agriculture workers to scientific research and exchange and thus contribute to poverty alleviation and economic development. I would like to take this opportunity once again to thank our speakers for sharing with us today their research findings and their views on how we can realize these goals. Without further ado, I would now like to initiate the panel discussion. Briefly, today's format will be: First, we will have one round of questions from the moderator to each panelist. Next, we have received several questions in advance. I will read these aloud and ask the comments, I'll ask the panelists to comment briefly. And finally, we will open up the floor to the audience. So please feel free to ask your question in either English or Japanese. And before stating your question or comment, please identify yourself, with name and affiliation and wait for the hall attendant to bring you a microphone.

So thank you. And the first question will go to keynote speaker Dr. Yagi. In your keynote speech you have discussed the FAO's voluntary guidelines for securing sustainable small-scale fisheries. You have also given some examples of small-scale activities in Japan, such as that of the Notsuke Fisheries Cooperative Association. Could you say a bit more about how we in Japan, drawing from such experiences, can work towards being successful in other parts of the world?

**YAGI Nobuyuki:**

Thank you very much. It's a very good question. I think the best use of the local resources such as the human organization or local knowledge or local environment, that is a key to be successful in the establishment of small-scale fisheries in other countries. In other countries, because of the diversity of the people's attitude towards nature or the natural conditions, we cannot just transfer the Japanese way of fisheries or aquaculture to other countries. Other countries, they have their own natural settings and human organizations. So, we need to respect that, the local situation. That is a quick answer from me. Thank you.

**Marcy N. WILDER:**

Thank you very much. The next speaker, to keynote speaker, Dr. Thilsted. You have enlightened us as to just how important aquatic foods are to achieving sustainable development and assuring that nutritional needs for all people are met. As you have stressed, it is important to engage everyone in these efforts. Could you elaborate a bit more on how important, how to inspire more women and youth to engage in careers or work opportunities relating to aquatic food systems?

**Shakuntala Haraksingh THILSTED:**

Thank you so much for that question. I think it's important and yes it's important within Food and Agriculture sectors but extremely important within the aquatic systems where we've seen the ages of those who are presently engaged in aquatic food systems is pretty high. And if we want it, interest youth and also young women to go into the different fields of studies, then it is important that they choose to study, for example, aquaculture and fisheries, food and agriculture. And we have seen in recent years that the number of young people who are attracted to these fields of studies, for example universities and colleges, is falling and therefore we must make these fields of study much more attractive for them to choose. One way I do think we can do that is looking at the types of from the

ways that we educate young people and in the field of aquatic food systems, I do think it would make it much more attractive if we would combine learning in the classroom and learning at universities with having young people spend time in communities to learn about aquatic food systems or to learn about traditional methods and traditional technologies. I think that's where one way not only to attract them, but also to make sure that the system gets to be very, you know, much more powerful and engaging. We also have to combine modern technologies such as data technologies, which are very attractive to young people, with that of traditional knowledge and there are many ways to do that and I do not think that we have truly tapped into the approaches that we should use, modern technologies, data technologies, it's a different scope of work. Traditional knowledge on which that's based with history, with storytelling, with the language that's used, that's a very different way of knowledge. But I do think that we that we are wise enough and can combine both so that it becomes attractive for the young people. And lastly, we should have targeted policies and instruments which render conditions for attracting young people within aquatic food systems. So that they for example include the conditions for loans, the conditions for access to outputs, for example, getting access to state lands on which they can practice aquatic food systems. Thank you.

**Marcy N. WILDER:**

OK. Thank you very much. The hands-on experience during the educational phase is very important, as I've understood. OK, thank you. The next question will go to Dr. Miyata. You have given us an overview of JIRCAS's research activities as part of your presentation and how they are related to promoting artisanal aquaculture in a number of countries. And you have emphasized that the fisheries themselves have to be on board, so for those of us who are about to embark on such work, what would be your further advice for designing projects that involve the exact people that we are trying to benefit?

**MIYATA Tsutom:**

Thank you, moderator Marcy. To make it more successful, participatory aquaculture by farmers is also required to the solution of bottle neck. So you know, the small size of seedling is a high mortality therefore, it is difficult to treat the small size seedling by aquaculture farmer so that's why we focused on the intermediate seedling to develop and create the new technology. So anyway, we focus on that, intermediate breeding techniques. Furthermore, we conducted the interdisciplinary approach research combining with natural scientific research and socioeconomic research, for dissemination of our technique to the local farmer and local officials. And furthermore, it is so very important to explain the scientific evidence to the local farmer and the local officials in some meeting, therefore it is needed, hold the meeting frequently. So that is very important to implementing a new technology in the village by farmers themselves. So this idea is from my success experiments in Japan. Thank you.

**Marcy N. WILDER:**

Thank you. So interdisciplinary work is very important and scientists being able, need to be able to articulate what their goals are. Thank you. The next question will go to Dr. Sakiyama. You have given us a very detailed explanation of Japan's progress made in seed production, technology and aquaculture for a number of important species. What would be your suggestions for adapting such technology to other countries? Would it be possible to involve artisanal fisheries?

**SAKIYAMA Kazutaka:**

I am Sakiyama. The question is whether the seed production technology we discussed earlier can be expanded to other countries, and what is needed to do so. To do so, we must first try to use standard technology. However, with regard to tools and equipment, there are some that can be used and some that cannot. First of all, I think it is important to try to create the same system using what is nearby and available. However, the fish breeding method presented earlier cannot be done with the parts to assemble the machine. I think it is very important to observe what kind of ecology the creatures show, how they behave, and whether or not they are able to eat food properly using such equipment. We are often misunderstood and evaluated as “this is no good because we couldn’t do it with the same equipment.” I think it is important to have an attitude of seeing with your own eyes to ensure improvement and refinement. The other point is whether we can involve the fishermen. Aquaculture originally began as a way to catch and rare wild fish. In Japan, such things were incorporated around 600 AD. I think it is important to first have fishermen grow the fish they catch, sell the grown fish, and then create a market to sell their produce. Once such a market is established, aquaculture using natural seedlings will be the first to emerge. However, wild fish for seedlings will not last forever, so artificial seedlings will become necessary once the scale of production expands to a certain extent. In order to produce artificial seedlings, the parents are necessary. The fishermen are the ones who breed the parents. In cooperation with fishermen, artificial seedlings will be created and brought to aquaculture. However, there will be competition between natural and farmed fish in a market. I think we need to think about how to combine the sale of wild fish with that of farmed fish so as not to invite too much competition between them. Therefore, in order to participate in mass production, I think it is important to first create a market and then breed parents for seed production.

**Marcy N. WILDER:**

Thank you very much. The next question goes to Dr. Wright. In your presentation today, you have enlightened us as to how seaweed culture will lead to the mitigation of greenhouse gas emissions by livestock and additionally have explained the science to us in detail. My question relates a little bit to a question that was asked in the session where you talked about what the profitability could be regarding this technology, but what do you have any specific plans for? How exactly do you plan to persuade livestock producers to use these seaweed-based feeds in their business operations?

**Jeffrey T. WRIGHT:**

Yes, thank you. Like I think the short answer for what will best persuade the livestock farmers because the, as I said earlier because the feed supplements are an additional cost to the farmers. The bit that I think they will need incentives to be persuaded to use those and I think the best incentives will come through government initiatives and in particular things like carbon credit schemes. So, in Australia we have what’s called the Emissions Reduction Fund, the ERF, and that’s a program set up by the Australian Government and the way it works is companies including farmers or other organizations can get projects set up within that fund. They need to be approved and they need to demonstrate that the activity that they’re claiming they’re going to do will actually reduce carbon emissions. And if they do that, then they can start to claim carbon credits. And once they get the carbon credits, they can potentially be sold either to the government or to other organizations or if they want to reduce their carbon footprint, they can hold on to those carbon credits as well. So there are different things that they can do with the carbon credits. Currently feed supplements such as seaweed are not approved within that scheme in Australia but there is an application that’s currently now before the regulator and I guess I think we’ll find out pretty soon whether that gets approved or not. Thank you.

**Marcy N. WILDER:**

Thank you very much for that. The next question goes to Dr. Yurimoto. You have given us a very detailed overview of your work in promoting sustainable blood cockle farming, both in the societal and scientific point of view. And you talked a little bit about your subsequent plans. Going forward, what do you expect to be the major challenges?

**YURIMOTO Tatsuya:**

Thank you for your questions. So in the case of Malaysia, in recent years the Fisherman's Association was organized in Selangor coast and new environmental monitoring program started with DOF and local fishermen and local people. So I hope the coastal management activities unite the fishermen, the citizens and the government so they will become a more active for a long time. These activities have led to the "Sato-Umi" concept. This is a Japanese word. "Sato" means in English home or village. "Umi" is sea in English and it is connected to environmental conservation and bioresource recovery. So I think it is important that experts from Japan and Malaysia work together with local fishermen and local people to regularly assess the coastal environment status for a long time for future support and also it is important to share the knowledge about successful active management cases in both countries in the future. I think that's all. Thank you.

**Marcy N. WILDER:**

Thank you very much. Next question is for Dr. Morioka. In your presentation you have made the case for the necessity of promoting improved management, production and utilization of small indigenous species. So in your opinion, what will be the best way to convince more local authorities and fishers to take up such endeavors?

**MORIOKA Shinsuke:**

Thank you, Dr. Wilder. Everybody said that well balanced combination of academia and administration and private sector including NGO and NPO are necessary to realize this kind of situation. So I am saying the same answer would be going to you, but actually what I have to say here is the people and residents there, for example, in Lao or Cambodia, have been already convinced of what they know, and what they need is that how to diversify the food material, including food material that has higher content of trace minerals and vitamins and other nutritional or functional contents. They know already. But the relatively new idea is how to use the indigenous small species, because indigenous small species were very low. Marketable value of these small species were very much low. That's why their motivation for producing these species was almost nothing. But if the, how to say, realistic technology or technique or processing for value addition like for example fermented fish, I think there's that kind of low market of low marketable value would be improved and also one of my friends at JIRCAS who is working on fermented fish in Lao, the so-called Pad-ek, then after fermentation of some kind of fish species. Some functional contents like for example vitamin B12 is synthesized by microbial activity in fermented fish. Such kind of functional features or processed fish or fishery product using the small indigenous fishes probably can be a one big tool to improve the marketable value. So anyway, I see again that well balanced academia and administration and the private sector is necessary to push this program for, to going forward. Thank you very much.

**Marcy N. WILDER:**

Thank you, Dr. Morioka. Finally, Dr. Altamirano, in your presentation you have explained to us how artisanal fisheries can be improved through community-based stock enhancement programs using the

example of the tiger shrimp. Could you elaborate a little bit more on this specific scientific whatever you're planning in the next phase of your project?

**Jon P. ALTAMIRANO:**

Thank you very much for that good question. So I think I have emphasized the term site specific and species specific. This can be imagined for example in comparing laboratory based and field based. So in the laboratory you can control the environment, but for stock enhancement which is essentially in the field, you have different factors interacting with each other. So it's not automatic that for example you read the paper about black tiger shrimp in this biology, you can just take that and use that in your experiment in the field. But the important thing is you need to verify whether that can match or that can be used in your site. So the important thing is you have to do all the detailed studies. I did not have time to really present that today. But the key thing there is that you'll be saving a lot of time in trying to do these scientific studies individually and answering specific questions. If you don't do that then you'll end up doing trial and error and spending maybe 10, 20 years of your life doing that. So we shortened that by doing these specific studies. And the key also for community based is not only environmental, it's not only biological and I think Dr. Yagi also mentioned the importance of the local setting. So you need to adjust in terms of species-specific site specificity, also in terms of the community that you're in. So respect the culture as well. So not only in terms of biology, environment, but also social and cultural; you need to be specific about in doing your projects. Thank you.

**Marcy N. WILDER:**

Thank you very much. I would just like to ask the panelists if anybody else has anything to add just very briefly? Does anybody wish to provide further comment? OK. Well, we're running out of time and we have four advanced questions, but I'd like to take some questions from the floor. So I'm only going to read two of them aloud for now and designate one of our keynote speakers to answer them. So the first question comes from Japan to Dr. Yagi. I would like to ask if you have any thoughts on the relationship between fishing and aquaculture. And how the balance of production will change in the future.

**YAGI Nobuyuki:**

Yeah, thank you. The question is to ask the proper balance between aquaculture and not capture fisheries for natural fish. I think on the aquaculture has two kinds, the one is to utilize the feed that is aquaculture for finfish, we need to input the feed for finfish, but other types, the type of aquaculture is not utilizing feed. The aquaculture for seaweed, for example the seaweed do not consume their feed, they are only, you know, growing using sunshine by phyto synthesis. And the other, the one is bivalve species. It's a shellfish and they are so-called plankton feeder. They only feed phyto zooplanktons and so the fishermen do not need to feed those bivalve species also, so those aquaculture that does not need, require feed, it has a huge potential. And also for example the seaweed aquaculture, the use of the product is not limited to the human consumption but also it's a consumption for animals and so those types of the aquaculture can be increased. But other types of aquaculture that require feeding activities, there is a natural limitation because feed are coming from the natural fish. So my conclusion is that aquaculture without using feed, it has a huge potential to be increased. Thank you.

**Marcy N. WILDER:**

Thank you very much. One more advanced question I would like to direct to Dr. Thilsted. This is also from Japan. If an abnormal rise in sea water temperature due to global warming continues for a long

time, what will be the impact on the flora and fauna of the sea in the future.

**Shakuntala Haraksingh THILSTED:**

Thank you. This is something that is an area of interest in many countries and if you look at the tropical countries and the area and the countries that are around the equator, this is some of this just in the Caribbean. This is something that many people are talking about, the other waters getting too warm and therefore that the fish would seek, would move away from the traffic, so move north and move south and therefore would be unavailable especially to local fishing communities. So this is one aspect that people are talking about and the other one is that if you go to colder waters like northern Europe. Already some fishermen in off the coast of England are talking about that there are other fish coming in and this is perhaps due to the warming again of the waters. We've done some work in Tonle Sap in the in the Mekong Delta and have seen that the temperatures are rising in the wetlands and in the rice fields and this seems to have because we have to look at it further, short period of that seems to have an effect on the diversity of this species, that there are lesser and lesser diversity of fish species. So I do think that we need to have some more data and to tease out the different movements that we're seeing in different parts of the world and the ways that is affecting different communities, for example if you have local communities that use boats with... that don't go far away, then of course that's going to have an effect on the amount of fish and the type of fish that they get. So it's not a one for all situation that goes in the same direction for all.

**Marcy N. WILDER:**

OK. Thank you very much. There's not that much time left. So I would like to take, I think we could take about two or three questions from the floor and anything please, if anybody would like to ask a question, please go ahead. Is there any, do we have any questions from the floor? There's one over there. OK, please identify yourself.

**Questioner (JIRCAS):**

I'm Hayashi from JIRCAS. My question goes to Dr. Wright, I thank so much for your presentation. And then about seaweed. So is there any side effect or benefit through applying this additive for month, for annual or for years for milking cow because when we're a child, our parents always ask to eat seaweed for shiny hair or good health, so I guess some benefit for the animal. Thank you.

**Jeffrey T. WRIGHT:**

Yeah. Thanks for your question. The amount of the Asparagopsis that the cows will be eating is very small. It's point five of a percent or 2% of the of the dry weight food that they're given. So they're not getting very much of it. There has been a couple of studies that I'm aware of that I've looked into what happens to the bromoform once it's been ingested. But unless it's at a very high concentration, much higher than would be applied in the feed supplements, it doesn't really seem to be an issue at all. It's not, it's just at really low levels. So hopefully that answers your question.

**Marcy N. WILDER:**

I think we can take one or two more questions. Are there any other questions from the floor? OK, we have a question over there.

**Questioner (JICA):**

Thank you, Mr. Chairperson. My name is Sugiyama. I'm from Japan International Cooperation Agency. My question goes to Dr. Shakuntala and Dr. Morioka. I'm very much impressed by your presentation, the potential role of fish and aquatic food for nutrition security. I think we should put more focus on this aspect of aquatic food. And when I think of how, you know, we can increase the contribution of aquatic food for nutrition security and when we think of the, you know, the production area of aquatic food, the fishing communities. You know, if we think of the nutritional status of fishing communities, since they are in the production area, they may not be deficient of the nutrition coming from fish. But those who need the nutrient from fish are the people not living in the fishing community coastal area, but the people living in the inland areas. So then if we think of the contribution of fish for nutrition security, we may have to think of the distribution issues, how we can supply fish from production area to non-production area. Then it comes to small fish which is very difficult to keep the quality and you know it's highly perishable that distribution may not be easy. It can be processed, but then there is another issue of acceptance of eating fish if the people are not used to eating the fish. So how do you think about, you know, to overcome these issues? I'm dealing with these issues. Thank you very much.

**Marcy N. WILDER:**

Thank you. Perhaps, Dr. Thilsted and then Dr. Morioka.

**Shakuntala Haraksingh THILSTED:**

Thank you for your views and what you said, there are many questions and also many answers, but let me start with one. So we've looked at consumption service in many countries and for many population groups and I would say all countries, but especially, but also for coastal communities, and especially for the poor and the vulnerable and countries in Africa and Asia. If you look at intrahousehold consumption patterns, you will see that in many communities, women and especially pregnant and lactating women and children from the age of six months to 18 months or even up to two years. That's the period where WHO has recommended complementary feeding, meaning continued breastfeeding, but where the breast milk is not sufficient for meeting the nutrient needs of the child and therefore must be complemented with additional foods complementary feeding. And in this period if you look at consumption and again from, as I mentioned before, pregnant and lactating women, consumption of aquatic foods is very low and you can increase the consumption and have a beneficial effect on the nutrition and health and the children's growth and development of children. So that's the first thing and that's nearly across the board even in rich countries. With respect to which population groups can benefit. So that's specific for which groups can benefit from a high intake of aquatic foods, that's pregnant and lactating women and children from the age of six months to two years because of all the effects it has in growth and development, all individual development and thereby national development. Think if you if we already know the research tells us that intake of aquatic foods improves school performance. And what if we can put a value on school performance and thereby the individual development and the effect that has on national development. There are other points you ask is about population groups that are close to waterbodies and those who are, for example, away from the waterbody. But we have looked at studies, for example in the urban poor, and they of course can benefit from an increased intake of aquatic foods and to do this as you say you rightly mentioned, you'd have to look at the supply chains and we know in many countries the supply chains, the cold storage transportation is poor. So this is why one of the ways is trying to develop convenient products that have a long shelf life and do not require refrigeration or freezing for example as we have in Africa with smoking and with drying and making the product for example into a powder that can easily be added to cooked foods. For example, if you would make a porridge for the child, then you can add a

fish powder, a teaspoon of fish powder, which would greatly increase the micronutrient content of the porridge.

**MORIOKA Shinsuke:**

Yeah, I think that Dr. Shakuntala said almost the same thing, nearly 100% I have to say. But if I add something, I think that Dr. Sugiyama asked one thing about eating culture, if the people like eating fish or not and I don't know about the very small tribal area in right for example in Lao northern edge of the country. I don't know. But in general almost all the people like eating fishes if there is beside or there is not, then. But another problem: the people like eating fish, but sometimes the people are eating fish in the form of, how to say, non-cooked fish and it is the cause of parasitic diseases so that we have to pay attention about this, but generally saying the people accept the, how to say, the culture of eating fishes and they rather like eating fresh fishes, but I think if they may, not less acceptable about the processed fishes, but what Dr. Shakuntala told that probably the way of processing can be a bit more modified for better acceptability by the residents, that's my answer, thank you very much.

**Marcy N. WILDER:**

Thank you very much. I'm afraid we're out of time. So I would like to thank our distinguished panelists once again for their enlightenment and thank you for everybody. Please join me in a round of applause for the panelists.