

JIRCAS Newsletter

for

INTERNATIONAL COLLABORATION



JIRCAS International Symposium 2018

U Thant International Conference Hall, United Nations University, Tokyo, Japan, November 6, 2018

Special Feature: JIRCAS International Symposium 2018

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Women's Contribution to “Fisheries” and the SDGs - To Realize a Sustainable Society -

To support the achievement of gender equality, the Japan International Research Center for Agricultural Sciences (JIRCAS) has been working on human resource development in developing areas through implementation of collaborative researches and by improving the work environment and scientific capacity of women researchers. In 2016, JIRCAS started the program, entitled “Initiative for Realizing Diversity in the Research Environment,” which seeks to promote an active role for women researchers and is supported by funds from Japan’s Ministry of Education, Culture, Sports, Science and Technology (MEXT) for the ‘development of human resources in science and technology.’

Under this program, JIRCAS has been jointly working with the Tokyo University of Agriculture and Technology (which acts as the representative institution) and other attending organizations for the establishment of a better workplace environment so that women researchers can play more active roles. As part of our activities for the year, we focused on fisheries and convened the JIRCAS International Symposium 2018, themed “Women in Fisheries: Sustainable Development Goals (SDGs) and Contributions to Research and Industry,” at the U Thant International Conference Hall, United Nations University, Tokyo, Japan, on November 6. This issue of the newsletter features this symposium and summarizes the contents of the presentations and the general discussion.

At this symposium, we invited well-known international experts to deliver lectures and exchange opinions. Our speakers brought with them a wider vision of how women workers can contribute to the fisheries industry, in addition to providing their viewpoints in relation to women researchers’ activities in the field of fisheries and aquaculture. In many developing countries, fishery products are important not only as foods (in simple terms) but also as food for achieving nutritional balance by supplementing the



body’s supply of precious protein and minerals and thus serving an important role in supporting a sound and healthy life.

Therefore, we aimed to provide an atmosphere for women to work happily and promote gender equality by examining the role of women through a filter (in terms of fisheries) and by broadly discussing about places where women can play an active role in society, in the economy, in the community, and in the household. In this symposium, we were also able to share our views from another viewpoint, and we exchanged opinions on how women could contribute toward achieving the SDGs as listed in the 2030 Agenda for Sustainable Development and adopted at the UN Summit in September 2015, with a focus on the cross-cutting theme of fisheries.

Through such activities, we would like to deepen cooperation among national and international organizations. It is important to support women researchers’ and employees’ career advancement and to tackle reforms to raise awareness about the role of women in fisheries. By doing this, we could build a society where both men and women can fully demonstrate their abilities, and we could then expect our society to steadily proceed, step by step, toward the realization of a sustainable society.

Osamu Abe
Director
Fisheries Division

JIRCAS International Symposium 2018

“Women in Fisheries: Sustainable Development Goals (SDGs) and Contributions to Research and Industry”

Date

November 6, 2018 (Tue) 13:00-17:30

Venue

U Thant International Conference Hall, United Nations University,
5-53-70 Jingumae, Shibuya-ku, Tokyo, Japan 150-8925

Host Organizers

Principal organizer:

Japan International Research Center for Agricultural Sciences (JIRCAS)

Co-organizer:

Japan Fisheries Research and Education Agency (FRA)

Supporting organizers:

Secretariat, Agriculture, Forestry and Fisheries Research Council, MAFF

Fisheries Agency of Japan

Tokyo University of Agriculture and Technology

Tokyo University of Foreign Studies

National Agriculture and Food Research Organization (NARO)

Greater Tokyo Initiative

The Japan Forum on International Agricultural Research for Sustainable Development (J-FARD)

Program

Opening Ceremony: 13:00-13:20



Opening Remarks: Masa Iwanaga
(President, JIRCAS)



Welcome Remarks: Kazuhiko Shimada
(Deputy Director General, Agriculture, Forestry and
Fisheries Research Council Secretariat, MAFF)

■ **Keynote Speeches:** 13:20-14:20

Chairperson: Kunihiro Doi (Director, Research Strategy Office, JIRCAS)

- 1) Meryl Williams (Chair, Gender in Aquaculture and Fisheries Section, Asian Fisheries Society)
“Women’s contributions to fisheries and aquaculture in the developing areas: Present achievements and future prospects for women researchers and administrators”
- 2) Kaoru Nakata (Executive Director, Japan Fisheries Research and Education Agency)
“Women in fisheries and aquaculture in Japan: Current achievements and future prospects in research and industry”

■ **Session 1 “Women in Fisheries Research”:** 14:20-15:30

Chairperson: Osamu Abe (Director, Fisheries Division, JIRCAS)

- 1) Yumiko Kura (Country Director, WorldFish Cambodia)
“The contribution of fisheries in achieving SDGs: Perspectives of women researchers”
- 2) Evelyn Grace de Jesus Ayson (Southeast Asian Fisheries Development Center/ Aquaculture Department)
“R&D on sustainable aquaculture for food and nutrition security in Southeast Asia”
- 3) Bong Jung Kang (Research Scientist, Fisheries Division, JIRCAS)
“Development of new aquaculture and seed production technology for commercially-important shrimp species: Research at JIRCAS”

*** Photo session, coffee break ***
15:30-15:55

■ **Session 2 “Women On-site in Fisheries and Aquaculture”:** 15:55-16:40

Chairperson: Masayoshi Saito (Director, Research Planning and Partnership Division, JIRCAS)

- 1) Izumi Seki (Professor, Tokai University)
“Activities of women in fishing communities starting businesses in Japan”
- 2) Bonnie Waycott (Writer, The Fish Site, 5M Publishing)
“Women in aquaculture: Stories from the field”

■ **Panel Discussion:** 16:45-17:20

Moderator: Marcy Wilder (Senior Research Scientist, Fisheries Division, JIRCAS)

■ **Closing Remarks:** 17:20-17:30



Closing Remarks: Osamu Koyama
(Vice-President, JIRCAS)

Keynote Speeches

For this year’s symposium, we invited two keynote speakers—one from an international research organization and another from a national research and development agency—to share their experiences and provide insights about gender issues in fisheries and aquaculture.

The first speaker was Dr. Meryl Williams. She has over 40 years of experience as a researcher starting in 1977 when she became the first woman researcher at the Queensland Fisheries Service in Australia. She is currently chair of the Gender in Aquaculture and Fisheries Section (GAFS) of the Asian Fisheries Society (AFS) and vice chair of the Scientific Advisory Committee of the International Seafood Sustainability Foundation. Prior to this, she was the director general of World Fish Center.

Dr. Williams started her lecture by narrating GAFS’s ‘journey’ beginning with the AFS Indian Branch in 1990 when they held a workshop titled “Women in Fisheries in India.” She mentioned the group’s efforts to widen the scope and increase participation through major conferences, including the “Women in Fisheries in Indo-China Countries Seminar” in 1996 and the “International Symposium on Women in Asian Fisheries” in 1998. She also talked about GAF, which she described as a loose network that organized gender-related activities in aquaculture and fisheries, and the Global Symposium on Gender in Aquaculture and Fisheries (GAF Conference), a major gathering organized by GAF and held on a regular basis since 2004.

The circumstances that define gender issues have been changing from year to year and GAF has been trying to address the hot topics. According to Dr. Williams, GAF was able to outline a feminist pathway, starting with the realization that ‘women do fish’ and ‘add value,’ and progressing through expansion of women’s participation in fisheries and taking a global look at the gender dimensions of fisheries, recognizing social relationships, and seeking greater equality. All these, she said, eventually led GAF to become a formal section of the AFS in 2017.

She further explained that women provide a new perspective on where gender research needs to go. She said that we should look at fisheries through a gender lens, and that it is possible to identify issues in aquaculture and fisheries more clearly if viewed from different perspectives.

She ended her lecture by telling the audience to observe the distinct kinds of inequality that have been existing in aquaculture and fisheries. She emphasized that women’s contributions to fisheries and aquaculture are closely related to policy and economic issues, thus it is important that women researchers put these issues in perspective and advance efforts toward equality.

The second keynote speaker was Dr. Kaoru Nakata, who is the current executive director (since 2016) of the Japan Fisheries Research and Education Agency (FRA). Dr. Nakata has been a researcher and has previously held multiple directorial positions in FRA and another institute, and her wide range of experience qualifies her as the best person to speak about women



Dr. Meryl Williams
(Chair, Gender in Aquaculture and Fisheries Section, Asian Fisheries Society)



Dr. Kaoru Nakata
(Executive Director, Japan Fisheries Research and Education Agency)

workers and female researchers in the fisheries sector in Japan.

She started her lecture by showing that the percentage of women workers in Japan's fisheries industries vary depending on job type, with 13.7% as fishers, 38.4% as land-based workers, and 61.7% as employees of marine product processing industries. She added that although women account for only 5.6% of ordinary members of Japan Fisheries Cooperatives (JF) and 0.55% of JF officials in 2015, female population at the Tokyo University of Marine Science and Technology (at 30% undergraduate and 35% graduate students) has been increasing moderately.

To increase women's participation, she explained that the Japanese Government had set numerical targets for the desired percentage of women in managerial positions at incorporated administrative agencies, including FRA. The targets for the end of FY2020 (from FY2015) were set at 15% (from 13.5%) of directors & section chiefs and 13% (from 10.5%) of board members. As for FRA, she reported that the current percentage of female researchers has been increasing to above 10% in 2018. She also noted that although the percentage of female board members is 11%, only 3% of directorial positions are occupied by women.

Dr. Nakata believed that gender differences in occupational choices and the low proportion of women in managerial positions may be attributed to gender stereotyping. Citing the study of Rudman and Glick (2008), she explained that women tend to fit the 'communal' stereotype, preferring close relationships and cooperating or merging with others. She further noted that recently, Japanese organizations have been giving preference to leaders who are team-based, democratic, and participatory; have shown capability to push toward complete success; and can extend trust to followers who in turn respond to strong leadership. In this context, she said that effective leadership seems to fit with women's stereotypical characteristics rather than men's.

Dr. Nakata then presented data on Japanese fisheries production, showing continuous growth from the 1950s and peaking at over 1.2 million tons in the 1990s, but decreasing to one third at present. She showed additional data indicating that the annual amount of protein intake from fishes went down from 40.2 kg in 2001 to 24.6 kg in 2016, having been overtaken by meat at 31.6 kg. She further noted that over a similar period, the total number of workers in

fisheries industries have also been decreasing, from around 240,000 in 2003 down to 150,000 in 2017 and turning gray quickly.

Based on these conditions, she remarked that in order to achieve sustainability of the fishing industry, it is important that enough salary be provided to fisherfolks for them to live and allow their children to receive appropriate education, and that it is equally important for workers in regional fishery industries to be more self-reliant and think about how to deal with problems by themselves.

Lastly, she described women as generally good at obtaining information through networking and that this information is worthwhile for researchers if their research results are utilized in the fisheries industries. She concluded her lecture by reiterating that increasing the number of women members at the decision-making level in the fisheries sector would be key to achieving a much-needed boost to Japan's fisheries sector.

As chair of the keynote speech session, I was delighted to have listened to these thought-provoking presentations by our keynote speakers, both of whom have taken on leadership roles in research organizations in the field of fisheries. I appreciate their efforts for boosting awareness among symposium participants of the real need to employ more female researchers and promote them to directorial positions, and for articulating the importance of women in fisheries industries and of the fishing industry itself.

Kunihiro Doi
Director
Research Strategy Office



Session Chair: Dr. Kunihiro Doi
 (Director, Research Strategy Office, JIRCAS)

Session 1 Women in Fisheries Research

In this session, two guest speakers (lectures summarized below) and a JIRCAS research scientist (featured in the next article) delivered presentations relevant to the activities of women researchers in the field of fisheries.

The first speaker, Ms. Yumiko Kura (Country Director, WorldFish Cambodia), presented several ideas on how fisheries could contribute to the SDGs and what role women researchers could play in this regard. She said that fisheries could contribute to almost all the SDGs. Aside from Goal 14 (Life Below Water), she particularly mentioned Goal 1 (No Poverty), Goal 3 (Good Health and Well-being), Goal 2 (Zero Hunger), and Goal 5 (Gender Equality). She also stated that the current focus of aquaculture and fisheries has been shifting from simply increasing fisheries production to examining the role of fisheries in assisting with the family budget and appraising the nutrient supply of households. Citing the FAO (2015), she said that when we put humans at the center, both women and men should share common resources and sit at the same table when it comes to decision making for fair allocation of labor and profit. According to Ms. Kura, WorldFish considers gender as a cross-cutting theme and that it is important to look at all associated activities through a gender lens. She said that researchers at WorldFish assess power balances and social norms that exist at community and

household levels, and that they use their knowledge and technologies to solve familiar problems to support women. She explained that it is necessary for researchers to “think out of the box and out of the comfort zones of their own individual expertise and space where they operate” in order to contribute to the progress of fisheries science and achieve the SDGs. She added that fisheries researchers, whether male or female, must acquire techniques and knowledge and take an approach without being constrained by gender stereotypes to achieve results beyond simply improving the amount of production. She concluded by saying that WorldFish practices this way of thinking and pays attention to the aquaculture business, post-harvest value chains, and the importance of fishery products in various food items consumed by households.

The second speaker, Dr. Evelyn Grace de Jesus Ayson (Scientist, Southeast Asian Fisheries Development Center/ Aquaculture Department), talked about the contribution of women to their programs while introducing the research and development programs and human resource development programs of the department. She reported that women occupy almost half the members of the management staff, the research and development staff, the senior staff, and the support staff in the department, and that women also account for about half the number of article authors. She also said that the department provides fair employment opportunities for men and women, and that the realization of the department’s programs relies heavily on the contribution of women in research, technology development, technology dissemination, and human resource development.

Through this session, we reconfirmed that there is no doubt in the capacity of women researchers. It is therefore important to create a stress-free work environment for women, raise awareness about gender equality, and promote gender-equitable reforms.



Ms. Yumiko Kura
(Country Director, WorldFish Cambodia)

Osamu Abe
Director
Fisheries Division



Dr. Evelyn Grace de Jesus Ayson
(Scientist, Southeast Asian Fisheries Development Center / Aquaculture Department)



Session Chair: Dr. Osamu Abe
(Director, Fisheries Division, JIRCAS)

Session 1

Development of New Aquaculture and Seed Production Technology for Commercially-important Shrimp Species: Research at JIRCAS

(Note: This lecture was delivered during Session 1, themed “Women in Fisheries Research.”)

Shrimp production continues to increase worldwide, reaching nearly 30 billion US dollars in market volume (FAO, 2016). Shrimp culture is conducted mainly in South Asia and Southeast Asia, with whiteleg shrimp (*Litopenaeus vannamei*) comprising more than 80% of production. While the shrimp culture industry has greatly advanced, many problems, such as reducing environmental impacts, mitigating disease outbreaks, and promoting a means of inducing female reproduction in captivity, remain to be solved. To address these problems, JIRCAS has been conducting research over the long term and is currently focusing on a project entitled “Development of advanced seed production and culture technology for economically-important shrimp species based on elucidation of reproductive mechanisms.”

In regard to previous research on environmentally friendly shrimp culture, JIRCAS, in collaboration with IMT Engineering, Inc., developed the Indoor Shrimp Production System (ISPS), which operates on a commercial basis in Japan. Currently, we are focusing on the next important task, i.e., the development of an “efficient, shrimp-friendly seedling production technology.” In my presentation during this session, I introduced the results of this ongoing project at JIRCAS and the achievements we have obtained thus far.

In order to support the needs of the world’s extended shrimp farming industry, it is necessary to produce a corresponding large number of post-larvae. Currently, eyestalk ablation is frequently used in commercial shrimp hatcheries to artificially induce ovarian maturation and spawning. This is because it is generally known that vitellogenesis-inhibiting hormone (VIH), which acts negatively on ovarian maturation, is produced in the eyestalks, and the removal of the source of VIH by eyestalk ablation allows ovarian maturation to occur. However, eyestalk ablation can cause adverse effects such as increased mortality rates and deterioration of egg quality. Moreover, it has received a great deal of criticism from the general public due to issues related to animal welfare. Under JIRCAS’s “Goal-Oriented Basic Research” strategy, we are carrying out the above-mentioned project on advanced seed production and culture technology for economically-important shrimp species in order to develop new techniques for the artificial control of ovarian maturation. The technology under development will be based on the elucidation of reproductive mechanisms in shrimp/Crustacea, especially relating to the biological functioning of maturation-regulating factors.

Under this project, in order to clarify the dynamics of vitellogenin (yolk protein) and VIH concentrations in the hemolymph, we established measurement systems for each of these substances. Using these systems, we were able to examine hemolymph vitellogenin and VIH levels as a function of molt stage and ovarian maturation. It was found that vitellogenin is induced after a surge of VIH in adult shrimp. We also elucidated the gene structure of five *L. vannamei* VIHs. Furthermore, we synthesized double-stranded RNA based on VIH gene structure and successfully suppressed VIH gene expression using RNA interference (at present, a patent is pending for this technology). In line with JIRCAS’s mission, we will continue to promote further research towards the development of new seed production technologies that can be used in hatcheries in major shrimp-producing countries.

Bong Jung Kang
Researcher
Fisheries Division



Dr. Bong Jung Kang during her lecture

Session 2 Women On-site in Fisheries and Aquaculture

Women play a critical role in fisheries. In particular, women's activities involving local communities are important in the field of processing fisheries and aquaculture products, with many of these initiatives being specific to local fisheries. Session 2's invited speakers introduced women who have taken on active roles in fisheries not only in Japan but also in other countries, and they presented a wealth of examples from surveys and interviews.

The first speaker was Professor Izumi Seki of Tokai University, Japan, with her presentation titled "Activities of women in fishing communities starting businesses in Japan." She introduced the situation, activities, and role of women's groups at fishing villages in Japan based on findings from a questionnaire survey. She also explained that fish processing and fish products manufacturing by women's groups accounted for a high ratio of the total sales and that it helped stabilize fluctuating incomes in fisheries. Furthermore, she pointed out that the activities have contributed toward making women become more self-reliant and thus fulfill a vital role in their local communities. Lastly, she mentioned the importance of conveying information using social networking services (SNS), etc., and that efforts to make young persons involved would be essential for the groups in addressing the serious problem of successor shortage.

The next speaker was Ms. Bonnie Waycott, who has been active in various media as an expert in fisheries and aquaculture in the United Kingdom. Her presentation, titled "Women in aquaculture: Stories from the field," featured the web series produced by "The Fish Site," an online media platform where she is a regular contributor. The Fish Site's Women in Aquaculture series, as the initiative is called, highlights stories from around the world about women who are active in the aquaculture industry. Ms. Waycott introduced the many unique characteristics of active women in fisheries, citing the stories of the catfish aquaculture farmer in Nigeria and the pseudo-bait farmer in the United States, among others, and pointed out that these aquaculture and fishing activities also contributed to gender equality and food security.

To sum up, the viewpoints expressed in the presentations (and from the speakers' supplemental comments in the panel discussion that followed) were different from those of researchers. Thus, the session became a good opportunity for gaining a better understanding of the role of women in the community and for recognizing that their activities greatly contribute to the achievement of Sustainable Development Goals (SDGs).

Masayoshi Saito
Director
Research Planning and Partnership Division



Dr. Izumi Seki
(Professor, Tokai University)



Session Chair: Dr. Masayoshi Saito
(Director, Research Planning and Partnership Division, JIRCAS)



Ms. Bonnie Waycott
(Writer, The Fish Site, 5M Publishing)



Dr. M. Saito, chair of Session 2, introducing the guest speaker

Panel Discussion

Women in Fisheries: Sustainable Development Goals (SDGs) and Contributions to Research and Industry

The proceedings of the day concluded in the Panel Discussion, during which all seven speakers took to the stage. The session was initiated by Dr. Marcy Wilder of the JIRCAS Fisheries Division, who served as moderator and gave a brief overview of the purpose of the Panel Discussion. At the outset, the moderator emphasized that JIRCAS is determined to further promote women's contributions to scientific and technological advancement in agriculture, forestry and fisheries, and convened this year's Symposium to showcase how women can contribute to the advancement of fisheries-related research and industry.

The Panel Discussion started out with one round of questions from the moderator to each panelist and then an additional round to the keynote speakers only. Panelists were then invited to follow-up in more detail among themselves, and finally, questions were opened to the audience.

The first question of the session was directed to keynote speaker Meryl Williams (Chair, Gender in Aquaculture and Fisheries Section, Asian Fisheries Society). Regarding whether the situation for women has changed compared to 30 years ago, Dr. Williams explained that it is difficult to generalize as statistics may reveal different results according to country and industrial sector. Nevertheless, she emphasized that in research institutions, it is very important to retain gender equality recruitment and retention practices and policies in order to move forward. Next, Executive Director Kaoru Nakata of the Japan Fisheries Research and Education Agency was invited to follow up on her view that role models are very important. She stated, "The number of women in managerial positions is gradually increasing, and it is extremely important that they encourage other women. Organizations should also recognize the merits of women in contributing to diversity in society."

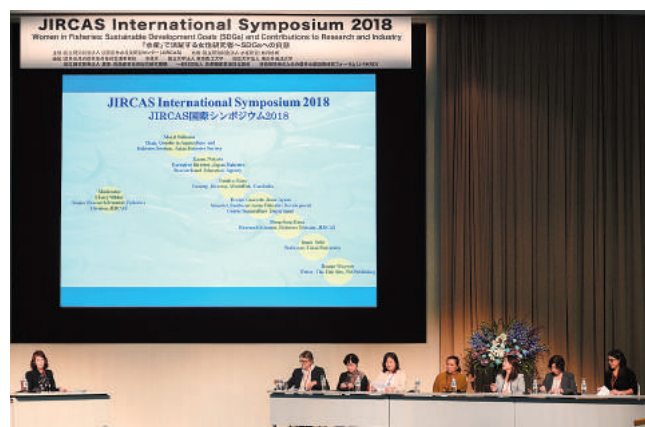
Each of the other panelists followed up on their respective presentations as follows. Country Director Yumiko Kura of WorldFish Cambodia explained that based on scientific knowledge, we need to ensure that women prioritize their own food and their young children's food so that their families can have healthy, economically productive lives in the developing regions. Dr. Evelyn Grace de Jesus Ayson of the Southeast Asian Fisheries Development Center (SEAFDEC) emphasized that mentoring is very important in retaining talented women in the organization. She said, "We mentor our technical and research assistants to encourage them to go into graduate school and then those who come back, we mentor to help them start careers in agriculture and fisheries research." Dr. Bong Jung Kang of the JIRCAS

Fisheries Division also echoed the need for role models, saying: "With sufficient numbers of role models, it will be easier for young women to imagine their futures, and ideally, those who are scientists should be considered for their achievements and not in the context of what gender they are." Professor Izumi Seki of Tokai University gave advice to young women starting careers. "What I would also like to say to young women is, 'fisheries' is an industry where each person's role is clear - people who fish, people who process, people who do research, and so forth," she said. "To this end, regardless of gender, we must recognize and respect each other's areas of work." Finally, writer Bonnie Waycott of The Fish Site gave a more in-depth opinion of how women are being recognized for their achievements, stating: "I think that there has been a very positive move in terms of raising awareness of what women are doing today."

The two keynote speakers then provided additional advice from their own personal experiences as to how women can persevere in the face of adversity. There was also a brief discussion among the panelists, with Ms. Waycott asking about the reaction in Japan towards women who have started fisheries-related businesses, to which Prof. Seki replied: "As Japan is promoting women's participation in general as a policy, various activities conducted by women are very well received. Support programs that can help these women are continually increasing in number, but more direct access to information in the field is still required."

Finally, the panel discussion concluded with some technical questions from the audience and a final exchange of opinion on women's advancement.

Marcy Wilder
Senior Researcher
Fisheries Division



Moderator and panelists on stage

2018 Japan International Award for Young Agricultural Researchers (Japan Award)

JIRCAS, in cooperation with the Agriculture, Forestry and Fisheries Research Council (AFFRC) Secretariat, MAFF, Japan, presented the 2018 Japan International Award for Young Agricultural Researchers (Japan Award) at the U Thant International Conference Hall, United Nations University (UNU), Tokyo, Japan, on 6 November 2018. This annual award, established in 2007, recognizes and honors young foreign researchers whose outstanding achievements promote research and development of agricultural, forestry, fishery and related industries in developing regions.

The awardees and guests were welcomed by Mr. Yoshio Kobayashi, chairman of the AFFRC. Congratulatory remarks were delivered by Dr. Takahiro Ueyama, executive member of the Council for Science, Technology and Innovation, Cabinet Office; Dr. Osamu Saito, academic director/academic programme officer of the UNU Institute for the Advanced Study of Sustainability; and Mr. Hideya Yamada, vice president of the Japan International Cooperation Agency (JICA). The selection process was explained by Dr. Mutsuo Iwamoto, chairperson of the Selection Committee. Mr. Kobayashi presented the commendation certificates and Dr. Masa Iwanaga, president of JIRCAS, presented the monetary prizes. The awardees delivered lectures highlighting their research achievements following the commendation ceremony.



Commemorative photo: 2018 Japan Award

The 2018 awardees and their research achievements



Dr. Andry ANDRIAMANANJARA
University of Antananarivo, Madagascar
Research Achievement:
Organic matter dynamics

in agroecosystems of Madagascar and its effective use for crop production



Dr. Farah Fazwa Md Ariff
Forest Research Institute Malaysia (FRIM), Malaysia
Research Achievement:
Production of high quality planting materials of popular

herbal species in Malaysia, *Labisia pumila*



Dr. Jinyong ZHANG
Institute of Hydrobiology, Chinese Academy of Sciences, China
Research Achievement:
Study on diverse

micro-organisms responsible for fatal parasitic disease outbreaks in farmed freshwater fish, and development of biology-based preventative measures against the diseases

JIRCAS Mail Magazine (English) Registration Guidance

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JIRCAS Newsletter

Japan International Research Center for Agricultural Sciences (JIRCAS)



March 2019 No.86
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