

Curriculum Vitae



Personal Information:

Name: Felix Gulleban Ayson

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Current office address:

Food and Agriculture Organization of the United Nations (FAO)
FAO Technical Cooperation Program in the Kingdom of Saudi Arabia
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Current position:

Senior Aquaculture Development Expert
FAO – Riyadh, KSA

Educational Attainment:

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| 1999-2000 | Post-doctoral Fellow Japanese Society for the Promotion of Science Laboratory of Molecular Endocrinology School of Fisheries Sciences Kitasato University, Japan Host Professor: Professor Hiroshi Kawauchi |
| 1997-1999 | Research Fellow Laboratory of Molecular Endocrinology School of Fisheries Sciences |

Kitasato University, Japan
Host Professor: Professor Hiroshi Kawauchi

- 1991-1994 Doctor of Science (Zoology)
Specialization in Fish Physiology and Endocrinology
Ocean Research Institute
University of Tokyo, Japan
Supervisor: Professor Tetsuya Hirano
- 1984-1987 Master of Science (Marine Biology)
Marine Science Institute
University of the Philippines
Diliman, Quezon City, Philippines
Supervisor: Dr. Flor J. Lacanilao
- 1977-1981 Bachelor of Science (Marine Biology)
University of San Carlos
Cebu City, Philippines
Graduated Cum Laude

Summary of expertise and skills:

1. Extensive knowledge and experience in research and training in aquaculture particularly on broodstock development and management, hatchery operations, and nursery and grow-out operations and management of tropical marine fishes.
2. Excellent research and analytical skills.
3. Extensive experience in writing and reviewing research proposals.
4. Excellent skills of getting research funds/grants from funding institutions.
5. Strong management and leadership experience.
6. Extensive knowledge on capacity building and mentoring of staff and institution building in the area of scientific research.
7. Strong ability to manage multiple tasks simultaneously and consistently meet deadlines.
8. Excellent thinking ability to evaluate/analyze complex issues.
9. Excellent oral and written communication skills in English with extensive experience in report writing.
10. A good team player.

Research interests: Fish Physiology, Fish Molecular Endocrinology, Marine Biotechnology, Climate Change in Aquaculture

Work experiences:

International Consultant/Senior Aquaculture Development Expert
Food and Agriculture Organization of the United Nations
Regional Office in Near East and North Africa
FAO Technical Cooperation Program in KSA
Riyadh, KSA
October 2017 – August 2018

Description of work: Serves as Team Leader of the Thematic Program Cluster on “Sustainable marine fisheries and aquaculture production and consumption”. The main objective of the Program is to increase fish production and consumption in KSA. The Program is composed of 7 major activities namely, (1) Development of ecosystem-based fisheries management framework for appropriate fishing technologies and good management practices; (2) Development of a plan to promote legal extension of Saudi fishing beyond the exclusive economic zone; (3) Formulation of strategy and action plan for the production of vaccines for commercial fish farming; (4) Formulation of a plan for introduction/adaptation of high value aquaculture fish species to diversify fish species used in aquaculture; (5) Improving feeding procedures in aquaculture to reduce feed conversion ratio and increase survival rate; (6) Formulation of strategy and action plan to increase national fish and seafood consumption, and (7) Formulation of strategy and action plan for a National Animal Aquatic Health Program. As Team Leader, I lead the implementation and technical quality assurance of the cluster activities and outputs, and provide assistance and advice to the FAO Programme Director in all matters related to the thematic cluster planning, implementation, monitoring and assessment.

International Consultant
Food and Agriculture Organization of the United Nations
Regional Office in Asia and the Pacific
Bangkok, Thailand
November 2016 – September 2017

Description of work: I wrote the review document for the Development of Aquaculture in the Asia-Pacific: Status and Trends for 2016. Likewise, I developed two Technical Guidelines for Climate Resilient Farming Practices of Tilapia in Ponds and Cages, and Technical Guidelines for Innovative Rice-Fish Farming. Both guidelines are outputs of the Regional TCP entitled “Promote scaling-up of innovative rice-fish farming and climate resilient Tilapia pond culture practices for blue growth in Asia” (TCP/RAS/3603) which is implemented in five countries in Asia-Pacific Region namely, Bangladesh, Indonesia, Philippines, Sri-Lanka and Viet Nam.

Chief

SEAFDEC Aquaculture Department
Tigbauan, Iloilo, Philippines
July 2012 – May 2016

Description of work: As Head of the organization with about 250-strong staff, I was responsible for the entire operations of SEAFDEC/AQD. It was also my responsibility to chart the future plans and directions of the Department, making sure that the SEAFDEC member countries get the most benefit from the results of all our programs and activities. I was responsible as well in ensuring the financial stability of the organization.

Scientist and Program Leader,
Marine Fish Program
SEAFDEC Aquaculture Department
Tigbauan, Iloilo, Philippines
January 2010 - June 2012

Description of work: I was in-charge of over-all coordination of research activities that seek to improve the technologies for broodstock management, seed production, nursery, and grow-out culture of important marine fish species, like, milkfish (*Chanos chanos*), Asian seabass (*Lates calcarifer*), mangrove red snapper (*Lutjanus argentimaculatus*), groupers (*Epinephelus coioides* and *E. fuscoguttatus*), rabbitfish (*Siganus guttatus*) and pompano (*Trachinotus blochii*).

Chief Technical Adviser
and Aquaculture Expert
Food and Agriculture Organization of the United Nations
Duty Station: Kingdom of Saudi Arabia
August 2007 – August 2010

Description of work: I was the Chief Technical Adviser to the Ministry of Agriculture (MOA) of the Kingdom of Saudi Arabia (KSA). My main responsibility was to supervise and guide the MOA in upgrading the capability of the Fish Farming Center (FFC) in Jeddah, Saudi Arabia as an aquaculture research institution that will ably support the increasing aquaculture activities in the country and in the neighboring countries in the Arab gulf region. FFC is the only aquaculture research center in KSA. I was in-charge of the overall operation of the FFC including the financial aspect. Technically, I trained/supervised the research staff of the Center in generating science-based aquaculture technologies through the proper conduct of scientific research. Researchers were guided in the writing of research proposals and the proper conduct of experiments to answer questions based on the problem areas identified for the aquaculture species that the Center was doing R&D on. Researchers were also guided/trained to write their research results and encouraged to publish these in peer-reviewed international scientific journals for proper verification of the research results and wider dissemination of research outputs. The laboratory facilities of the Center were upgraded to support the needs of the researchers. The tank facilities for hatchery, nursery and grow-out culture systems of the Center were also improved and renovated. Technologies for hatchery, nursery and grow-out culture systems of the fish species that the Center is working on were improved. In addition, the training and extension functions of the Center were likewise strengthened.

Senior Research
Specialist and
Program Leader of
Marine Fish Program

SEAFDEC Aquaculture Department
Tigbauan, Iloilo, Philippines
June 2006 - July 2007

Description of work: The marine fish program intends to improve the technologies for broodstock management, seed production, nursery, and grow-out culture of marine fish species, namely, milkfish (*Chanos chanos*), rabbitfish (*Siganus guttatus*), Asian seabass (*Lates calcarifer*), mangrove red snapper (*Lutjanus argentimaculatus*) and groupers (*Epinephelus coioides* and *E. fuscoguttatus*). Activities of the program encompass the whole range of the production cycle. These include broodstock development/management, seed production, nursery and grow-out culture systems. In addition, nutrition and fish health management are also integral part of the program. As program leader, it was my responsibility to manage and coordinate the various activities of the different units under the program; the Fish Broodstock Group, the Fish Hatchery Group, the Farming Systems Group, and the Feed Mill. With key personnel in place, I oversee the activities of the Fish Broodstock Facility, the Integrated Milkfish Broodstock and Hatchery Complex, the Multi-Species Marine Fish Hatchery, and the Feed Mill. It was also my responsibility to coordinate the different research activities of the program. Based on the regular department-wide annual review of the programs, we set the research direction of the program by identifying and prioritizing the research gaps and problems. I reviewed proposals submitted by researchers on the identified priority areas. Likewise, it was my responsibility to monitor the progress of the different research activities and harmonize them. For this, I instituted a regular monthly meeting for the program members. My responsibilities as a program leader are above my regular function as an active and independent researcher. In my group, we used the tools in molecular biology and biotechnology to complement the various traditional methods of increasing fish production in aquaculture systems.

Visiting Professor

Tropical Biosphere Research Center
University of the Ryukyus
Okinawa, Japan
September 2005 – May 2006

Description of work: I conducted research studies on gene expression rhythms of the hormones that are involved in growth and development in rabbitfish. The objective was to find out the interactions of these hormones and how to manipulate them to enhance growth. The hormones examined were growth hormone, prolactin, somatolactin, insulin-like growth factor I and II. In addition, I supervised graduate students in the conduct of their research studies and taught them the laboratory techniques that were needed in the conduct of their research work.

Scientist

SEAFDEC Aquaculture Department
Tigbauan, Iloilo, Philippines
November 1994 – July 2004

Description of work: I conducted research studies toward improving the production and/or increasing the survival of fish larvae in the fish hatchery. Fish species studied include milkfish, rabbitfish, grouper, snapper and sea bass. My work on growth enhancement in rabbitfish using the modern tools in biotechnology was funded by USAID. We submitted a proposal on poverty alleviation in rural fishing communities in the country through small scale aquaculture during the First Panibagong Paraan Competition in 2004 sponsored by World Bank. Our proposal was chosen as one of the winners and was given funding support by the Australian Agency for International Development (AusAID). I was a member of the SEAFDEC AQD Team that conceptualized the proposal for the establishment of Laboratories for Advanced Aquaculture Technologies (Biotech Laboratories) at SEAFDEC AQD through a Grant-in -Aid from the Government of Japan. The team was also actively involved in the design and construction of the laboratories, as well as the acquisition and setting up of all the equipment that went into all the laboratories. The Biotech facility was inaugurated in March 2003. I served as resource person in SEAFDEC AQD's national and international training courses particularly on topics on fish hatchery operations and biotechnology in aquaculture.

While in SEAFDEC/AQD during 1994-2004, served as:

Sub-program Leader: Sub-program on “Development of improved technologies for hatchery and nursery of fish and crustaceans”
Jan 2001-July 2004

As sub-program leader, I headed a group of principal investigators, mainly senior researchers (with Masters and PhDs), in setting the research direction of the sub-program. We identified and prioritized problem areas and research gaps in the hatchery and nursery technologies developed at SEAFDEC AQD for finfish, crustaceans and mollusks, as well as natural food organisms. Principal investigators were invited to submit research proposals based on the priorities. It was my duty as the sub-program leader to determine that the research activities fall within the priority problem areas and address the identified research gaps. Likewise, it was also my duty to regularly monitor the progress of the experiments and ensure the success of the research activities.

Section Head: Nursery Section, Research Division
Sep 2003-July 2004

It was my responsibility to effectively manage the research activities as well as the administrative matters of the section including staff distribution and utilization of facilities such as the multi-species fish hatchery, the crustacean (crab and shrimp) hatchery, the natural food laboratory, and the integrated fish broodstock and hatchery complex.

Manager: Integrated Fish Broodstock and Hatchery Complex

Sep 2003-July 2004

SEAFDEC AQD developed the technologies for breeding and fry production of milkfish under captivity. This facility is designed to showcase to the public the available technologies for the production of milkfish from eggs to fingerlings. As such, eggs and fry of milkfish are mass-produced for disposal to interested fish farmers. I was responsible for the entire operation of the complex including marketing of fry produced in the hatchery.

Fish Hatchery Manager: Multi-species Fish Hatchery
Sep 2003-July 2004

SEAFDEC AQD also developed the technologies for breeding and fry production of other marine fish species of economic importance in Southeast Asia like grouper, snapper, Asian sea bass and rabbitfish. The multi-species fish hatchery is designed to showcase to the public the available technologies for the production of these fishes from eggs to fingerlings. Verification studies for the refinement of the existing larval rearing protocols for these fishes are done in this facility. I was responsible for the entire operation of the facility.

Research Associate SEAFDEC Aquaculture Department
Tigbauan, Iloilo, Philippines
October 1988 - October 1994

Instructor Mindanao State University
Naawan, Misamis Oriental, Philippines
June 1984 - September 1988

Research Assistant Mindanao State University
Naawan, Misamis Oriental, Philippines
July 1981 - May 1984

List of scientific publications/ Technical guidelines/Manuals/Book chapter:

FAO 2017. Technical guidelines for climate-resilient farming practices of tilapia in ponds and cages. FAO RAP 2017. 76 p. (wrote the draft guidelines).

FAO 2017. Technical guidelines for innovative rice-fish farming. FAO RAP 2017. 56 p. (wrote the draft guidelines).

FAO 2017. Regional overview of the status and trends of aquaculture in the Asia-Pacific Region 2016. FAO RAP 2017. 98 p. (wrote the draft overview).

- Ayson, F.G.**, Ventura, A.M. and de Jesus-Ayson, E.G.T. 2016. Sustainable milkfish production in marine fish cages through strong government support and effective public-private partnerships: A case study from Panabo City Mariculture Park in Davao del Norte, Philippines. *In: FAO 2016. Sustainable intensification of aquaculture in the Asia-Pacific Region. Documentation of successful practices.* Miao, W and Lal, K.K. (Eds.). Bangkok, Thailand.
- Ayson, F.G.**, Reyes, O.S. and de Jesus-Ayson, E.G.T. 2014. Seed production of rabbitfish. Aquaculture Extension Manual No. 59, SEAFDEC/AQD, Tigbauan, Iloilo, Philippines, 20 p.
- Ayson, F.G.**, Sugama, K., Yashiro, R. and de Jesus-Ayson, E.G.T. 2014. Nursery and grow-out culture of Asian seabass, *Lates calcarifer*, in selected Southeast Asian countries. *In: Biology and Culture of Asian Seabass*, D.R. Jerry (Ed.) 273-292.
- de Jesus-Ayson, E.G.T., **Ayson, F.G.** and Thepot, V. 2014. Early development and seed production of Asian seabass, *Lates calcarifer*. *In: Biology and Culture of Asian Seabass*, D.R. Jerry (Ed.) 16-30.
- de Jesus-Ayson, E.G.T. and **Ayson, F.G.** 2014. Reproductive biology of the Asian seabass, *Lates calcarifer*. *In: Biology and Culture of Asian Seabass*, D.R. Jerry (Ed.) 67-76.
- Samentar, L.P., **Ayson, F.G.**, de Jesus-Ayson, E.G.T. and Formacion, M.J. 2013. Cloning of mangrove red snapper (*Lutjanus argentimaculatus*) growth hormone cDNA and mRNA expression during early development. *Philippine Journal of Natural Sciences*, 18-2: 21-29.
- Ayson, F.G.**, de Jesus-Ayson, E.G.T. and Takemura, A. 2007. mRNA expression patterns for GH, PRL, SL, IGF-I and IGF-II during altered feeding status in rabbitfish, *Siganus guttatus*. *General and Comparative Endocrinology*, 150: 196-204.
- Ayson, F.G.** and Takemura, A. 2006. Daily expression patterns for mRNAs of GH, PRL, SL, IGF-I and IGF-II in juvenile rabbitfish, *Siganus guttatus*, during 24-hour light and dark cycles. *General and Comparative Endocrinology*, 149: 261-268.
- Pedroso, F., de Jesus-Ayson, E.G.T., Cortado, H., Hyodo, S. and **Ayson, F.G.** 2006. Changes in the mRNA expression of grouper (*Epinephelus coioides*) growth hormone and insulin-like growth factor I in response to nutritional status. *General and Comparative Endocrinology*, 145: 237-246.
- Funkenstein, B., Dyman, A., Lapidot, Z., de Jesus-Ayson, E.G.T., Gertler, A. and **Ayson, F.G.** 2005. Expression and purification of a biologically active recombinant rabbitfish (*Siganus guttatus*) growth hormone. *Aquaculture*. 250:504-515.

- Ayson, F.G.**, de Jesus, E.G.T., Moriyama, S., Hyodo, S., Funkenstein, B., Gertler, A. and Kawauchi, H. 2002. Differential expression of insulin like growth factor I and II mRNAs during embryogenesis and early larval development in rabbitfish (*Siganus guttatus*). *General and Comparative Endocrinology*, 126: 165-174.
- de Jesus, E.G.T., **Ayson, F.G.**, Amemiya, Y., Moriyama, S., Hyodo, S., Hirano, T., and Kawauchi, H. (2002). Milkfish (*Chanos chanos*) growth hormone cDNA cloning and mRNA expression in embryos and early larval stages. *Aquaculture*, 208: 177-188.
- Ayson, F.G.**, de Jesus, E.G.T., Amemiya, Y., Moriyama, S., Hirano, T. and Kawauchi, H. 2000. Isolation, cDNA cloning, and growth promoting activity of rabbitfish (*Siganus guttatus*) growth hormone. *General and Comparative Endocrinology*, 117: 251-259.
- Moriyama, S., **Ayson, F.G.**, and Kawauchi, H. 2000. Growth regulation by insulin-like growth factor I in fish. *Biosci. Biotechnol. Biochem.*, 64:1553-1562.
- Ayson, F.G.**, de Jesus, E.G.T., Amemiya, Y., Moriyama, S., Hirano, T. and Kawauchi, H. 1999. Isolation and cDNA cloning of somatolactin in rabbitfish (*Siganus guttatus*). *General and Comparative Endocrinology*, 115: 292-300.
- Ayson F.G.**, Kaneko, T., Hasegawa, S. and Hirano, T. 1995. Cortisol stimulates the size and number of mitochondrion-rich cells in the yolk-sac membrane of embryos and larvae of tilapia (*Oreochromis mossambicus*) in vitro and in vivo. *Journal of Experimental Zoology*, 272:419-425.
- Ayson F.G.**, Kaneko, T., Hasegawa, S. and Hirano, T. 1994. Differential expression of two prolactin and growth hormone genes during early development of tilapia (*Oreochromis mossambicus*) in fresh water and seawater: Implications for possible involvement in osmoregulation during the early life stages. *General and Comparative Endocrinology*, 95:143-152.
- Ayson F.G.**, Kaneko, T., Hasegawa, S. and Hirano, T. 1994. Development of mitochondrion-rich cells in the yolk-sac membrane of embryos and larvae of tilapia, *Oreochromis mossambicus*, in fresh water and seawater. *Journal of Experimental Zoology*, 270:129-135.
- Ayson F.G.**, Kaneko, T., Tagawa, M., Hasegawa, S., Grau, E.G., Nishioka, R.S., King, D.S., Bern, H.A. and Hirano, T. 1993. Effects of acclimation to hypertonic environment on plasma and pituitary levels of two prolactins and growth hormone in two species of tilapia, *Oreochromis mossambicus* and *Oreochromis niloticus*. *General and Comparative Endocrinology*, 89:138-148.
- Ayson, F.G.** and Lam, T.J. 1993. Thyroxine injection of female rabbitfish (*Siganus guttatus*) broodstock: Changes in thyroid hormone levels in plasma, eggs and yolk-sac larvae and its effects on larval growth and survival. *Aquaculture*, 109:83-93.

Ayson, F.G. 1991. Induced spawning of rabbitfish, *Siganus guttatus* (Bloch) using human chorionic gonadotropin (HCG). *Aquaculture*, 95:133-137.

Ayson, F.G., Parazo, M.M. and Reyes, D.M. 1990. Survival of young rabbitfish (*Siganus guttatus* Bloch) under simulated transport conditions. *Journal of Applied Ichthyology*, 6:161-166.

Ayson, F.G. 1989. The effect of stress on spawning of brood fish and survival of larvae of the rabbitfish, *Siganus guttatus* (Bloch). *Aquaculture*, 80:241-246.

Scientific meetings attended/Paper Presentor/Invited talks/Plenary Speaker/Workshop Resource Person:

12-14 September 2017. Regional Training and Verification Workshop on Technical Guidelines for Innovative Rice-Fish Farming and Climate Resilient Tilapia Culture” (TCP/RAS/3603). Served as Resource Person for both Technical Guidelines. Ibis Styles Bangkok Khaosan Viengtai. Bangkok, Thailand.

25-26 May 2017. Inception Workshop of Regional TCP Project “Promote scaling-up of innovative rice-fish farming and climate resilient Tilapia pond culture practices for blue growth in Asia” (TCP/RAS/3603). Delivered the Workshop Paper on “Climate Resilient Tilapia Farming Practices”. Ibis Styles Bangkok Khaosan Viengtai. Bangkok, Thailand.

13 May 2016. Palawan Council for Sustainable Development Forum on “Ensuring the Sustainable Management of Reef-Fish-for-Food in the Province of Palawan”. Delivered a talk on “Breeding and Seed Production of Groupers”. Asturias Hotel, Puerto Princesa City, Palawan, Philippines.

03 May 2016. Workshop on Climate-Resilient Aquaculture Operation. Delivered a talk on “Environmental Physiology of Cultured Milkfish and Groupers”. Rembrandt Hotel, Quezon City, Philippines.

27-29 April 2016. Workshop on Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia”. Served as Chair of the Session on the Status of Eel Industries in Southeast Asia. Emilia Hotel, Palembang, Indonesia.

01-04 March 2016. Stakeholders Consultation and Drafting of Guidelines and Policies on Regional Cooperation in Sustainable Fisheries Development Towards the ASEAN Economic Community. Bangkok Hotel Lotus, Bangkok, Thailand.

22-24 February 2016. ASEAN Regional Technical Consultation on Acute Hepatopancreatic Necrosis Disease (AHPND) and other Trans-boundary Diseases in Southeast Asia. Best Western Hotel, Makati, Philippines.

15 February 2016. Australian Center for International Agricultural Research (ACIAR)-Philippines Annual Strategy Discussion Meeting. Representing Aquaculture Research Sector. Dusit Thani Hotel, Makati, Philippines.

03 February 2016. National Fisheries Industry Summit. Philippine Trade and Training Center, Pasay City, Philippines.

19-20 December 2015. International Symposium of Science and Technology Research Partnerships for Sustainable Development (SATREPS) - Programs on Sustainable Aquatic Bioresources. Delivered a Plenary Talk on “The Southeast Asian Fisheries Development Center Aquaculture Department: Its Role in the Development of Tropical Aquaculture”. Tokyo University of Marine Science and Technology, Tokyo, Japan.

27-30 June 2015. ASEAN Regional Symposium on Resource Enhancement. Served as Moderator of the Plenary Discussion on the Theme – “Fishery Resources Enhancement through Artificial Propagation and Stock Release”. Pattaya, Thailand.

16-18 June 2015. FAO NACA Regional Workshop on Documentation and Dissemination of Successful Practices of Sustainable Intensification of Aquaculture in the Asia-Pacific Region. Delivered the Invited Paper entitled “Sustainable Milkfish Production in Marine Cages in the Philippines through Strong Government Support and Effective Public-Private Partnerships”. Hotel Centara Grand Ladprao, Bangkok, Thailand.

02-04 June 2015. ASEAN Aquaculture Industry Summit: ASEAN Economic Community and Beyond. Delivered a Statement during the Opening Program and served as a panelist in the session on “Strategies and Future of ASEAN Feed Development”. St. Regis Hotel, Singapore.

17-19 March 2015. International Conference on Marine Science and Aquaculture. Delivered a Keynote Lecture on “Possible Impact of Climate Change in Marine Aquaculture: Implications of Global Warming on the Fry Production of some Important Aquaculture Species”. Promenade Hotel, Kota Kinabalu, Malaysia.

24 February 2015. National Eel Forum. Delivered a Talk on “SEAFDEC Initiatives on Eel Info-Compilation in Southeast Asia”. Bureau of Water and Soils Management Conference Hall, Department of Agriculture, Quezon City, Philippines.

January 2015. Philippine Science High School (PSHS) Science Week Celebration. Delivered a talk on “Growth enhancement in rabbitfish”. PSHS West Visayas Campus Auditorium. Jaro, Iloilo City, Philippines.

09-11 December 2014. ASEAN Regional Technical Consultation (RTC) on Development and Use of Alternative Dietary Ingredients or Fish Meal Substitutes in Aquaculture Feed Formulations. Nay Pyi Taw, Republic of the Union of Myanmar.

29 November 2014. FAO Workshop on Prioritization of Programs for Asia-Pacific Regional Aquaculture Development and Management. Royal Orchid Sheraton Hotel, Bangkok, Thailand.

27-28 November 2014. APFIC, FAO, NACA, DOF Thailand - Regional Consultation on Strategy and Action Plan for Sustainable Intensification of Aquaculture in Asia-Pacific. Royal Orchid Sheraton Hotel, Bangkok, Thailand.

9-11 September 2014. Final Project Workshop of the EU-funded Project on Aquaculture for Food Security, Poverty Alleviation and Nutrition (AFSPAN). Boma Inn Hotel, Nairobi, Kenya. Served as Philippine Country Partner Representative.

25-26 August 2014. EU & ASEAN Experts Consultation on Aquaculture. Jakarta, Indonesia.

07-11 June 2014. World Aquaculture Society Meeting. Presented a paper on “Failure of spawning, impaired embryo viability and low larval survival of important tropical aquaculture fish species after exposure to elevated seawater temperature: Implications of global warming on the fry production of these fish species in the hatchery”. Adelaide Convention Centre, Adelaide SA, Australia.

03-04 March 2014. Second Meeting of the ASEAN Public-Private Taskforce for Sustainable Fisheries and Aquaculture. Hilton Garden Inn, Hanoi, Viet Nam. Presented the Regional Plan for the Aquaculture Feed Management Activity.

20-21 February 2014. International Conference on the West Philippine Sea. Delivered a Plenary Talk on “Livelihood Opportunities Through Farming of Selected Aquatic Organisms and Associated Challenges due to the Changing World Climate”. AA Plaza Hotel, Puerto Princesa City, Palawan, Philippines.

20-22 November 2013. Second Project Workshop of the EU-funded Project on Aquaculture for Food Security, Poverty Alleviation and Nutrition (AFSPAN). Labomar, Universidade Federal do Ceara, Fortaleza, Brazil. Served as Philippine Country Partner Representative.

October 2013. Bureau of Fisheries and Aquatic Resources Fish Conservation Week. Delivered a talk on “SEAFDEC/AQD’s program on climate change in aquaculture”. SM Convention Center, SM Megamall, Mandaluyong City, Philippines.

09-10 October 2013. World Wildlife Fund - First Grouper and Snapper Aquaculture Dialogue. The Northam All Suite, Penang, Malaysia.

27-28 March 2013. First Meeting of the ASEAN Public-Private Taskforce for Sustainable Fisheries and Aquaculture. Grand Hyatt Hotel, Bali, Indonesia. Served as Facilitator for the Aquaculture Group Discussion.

10-13 September 2012. Inception Workshop of the EU-funded Project on Aquaculture for Food Security and Poverty Alleviation and Nutrition (AFSPAN). WorldFish Center, Penang, Malaysia. Served as Philippine Country Partner Representative.

13-17 June 2011. ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 – Fish for the People 2020, Adaptation to a Changing Environment” held in Sofitel Centara Grand Bangkok Hotel, Bangkok, Thailand. Served as a panelist for the sub-theme “Supply of Good Quality Seeds for Sustainable Aquaculture”.

18-23 April 2011. Annual Meeting of the USAID AquaFish Collaborative Research Support Program (CRSP). Delivered a concept paper on the “Development of improved culture techniques for snakeskin gourami for small-scale rural freshwater aquaculture and stock enhancement in the Philippines” during the Air Breathing Fishes Workshop. Marriott Hotel, Shanghai, China.

17-19 March 2010. Regional Technical Consultation for Sustainable Aquaculture Development in Southeast Asia Towards 2020 (RTC on Aquaculture). Served as a panelist for the sub-theme “Quality Seeds for Sustainable Aquaculture”. Windsor Suites Hotel, Bangkok, Thailand.

3-4 December 2009. 36th Annual Convention of the Philippine Society for Biochemistry and Molecular Biology (PSBMB). Served as a judge for the oral presentation of the Young Scientist Forum. Central Mindanao University, Musuan, Bukidnon, Philippines.

14 February 2007. 9th Anniversary Celebration of the National Institutes of Health and 5th University Science and Technology week of the University of the Philippines-Manila. Delivered an invited paper on “Biotech solutions for aquaculture production: Growth enhancement in fish through GH-fortified feeds”. University of the Philippines, Manila, Philippines.

07-08 December 2006. 33rd Annual Convention of the Philippine Society for Biochemistry and Molecular Biology (PSBMB). Delivered a plenary talk on ‘Biotech solutions for aquaculture production: Growth enhancement in fish through GH-fortified feeds and transgenesis’. West Visayas State University, Iloilo City, Philippines.

05-12 November 2006. 10th Annual Meeting of the Asia Pacific Economic Council (APEC), Research, Development and Extension on Agricultural Biotechnology (RDEAB). Delivered a talk on ‘ Biotechnology for Aquaculture’. Diamond Hotel, Manila, Philippines.

24-26 October 2006. 38th Annual Meeting of the Federation of Institutions for Marine and Freshwater Sciences (FIMFS). Delivered a plenary talk on ‘Biotechnology for Aquaculture’. University of San Carlos, Cebu City, Philippines.

05-06 December 2002. 29th Annual convention of the Philippine Society for Biochemistry and Molecular Biology (PSBMB). Presented a paper on “Production and characterization of recombinant rabbitfish growth hormone in *Escherichia coli*”. University of the Philippines Los Banos, Laguna, Philippines.

08-11 October 2002. 4th InterCongress Symposium of the Asia Oceania Society for Comparative Endocrinology (AOSCE). Presented a paper on “Differential expression of mRNAs of the growth hormone family proteins and insulin like growth factors during early development in rabbitfish, *Siganus guttatus*”. Sun Yat Sen University, Guangzhou, China.

09 July 2002. Dean Domiciano K. Villaluz Memorial Lecture. Delivered the annual lecture titled “Facing the challenges in aquaculture through biotechnology”. SEAFDEC Aquaculture Department, Tigbauan, Iloilo.

19-24 November 2001. ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millenium: Fish for the People. Delivered a paper on “Biotechnology in Aquaculture”. Hotel Grand Centara, Bangkok, Thailand.

01-06 October 2001. International Symposium for the 70th Anniversary of the Japanese Society of Fisheries Science. Presented a paper on “Growth enhancement in rabbitfish, *Siganus guttatus*”. Served as co-chair in the session on Endocrinology of Fish Growth. Yokohama Convention Center, Yokohama, Japan.

06-08 December 2000. 27th Annual convention of the Philippine Society for Biochemistry and Molecular Biology (PSBMB). Presented a paper on “Rabbitfish IGF-I and II: Cloning and expression during early larval stages”. SEAFDEC Aquaculture Department, Tigbauan, Iloilo.

31 July-3 August 2000. 4th International Symposium on Fish Endocrinology. Presented a poster paper on “Growth hormone and insulin-like growth factor I and II expression during early development in rabbitfish”. University of Washington, Seattle, Washington, U.S.A.

22-24 July 1999. 24th Annual Meeting of the Japan Society for Comparative Endocrinology. Presented a poster paper on “Isolation and cDNA cloning of rabbitfish (*Siganus guttatus*) somatolactin”. University of Nagoya, Nagoya, Japan.

11-14 November 1998. 5th Asian Fisheries Forum. Presented a paper on “Molecular cloning of growth hormone cDNA in the rabbitfish, *Siganus guttatus*”. Lotus Hotel Pang Suan Kaew, Changmai, Thailand.

30 July–01 August 1998. 23rd Annual Meeting of the Japan Society for Comparative Endocrinology. Presented a poster paper on “Rabbitfish (*Siganus guttatus*) growth hormone: Isolation, purification and cloning of cDNA”. Kamaishi, Japan.

14-16 November 1997. 3rd Ocean Research Institute Symposium on Strategy for Environmental Adaptation of Fishes. Delivered a paper on “Chloride cells in yolk sac membrane of tilapia (*Oreochromis mossambicus*) embryos and larvae and their hormonal regulation”. Yoyogi Olympics Memorial Youth Center, Tokyo, Japan.

16-20 October 1995. 4th Asian Fisheries Forum. Presented a paper on “Triiodothyronine enrichment of eggs of the rabbitfish (*Siganus guttatus*) and its effects on growth and survival of larvae”. Beijing International Convention Center, Beijing, China.

25-26 August 1993. 18th Annual Meeting of the Japan Society for Comparative Endocrinology. Presented a poster paper on “Activity of prolactin and growth hormone cells during early development of tilapia in fresh water and seawater: Implications for possible involvement in osmoregulation during the early life stages”. University of Tokyo, Tokyo, Japan.

16-21 May 1993. 12th International Congress of Comparative Endocrinology. Presented a poster paper on “Salinity effects on pituitary prolactin and growth hormone cells and chloride cells in yolk sac membrane of tilapia (*Oreochromis mossambicus*) embryos and larvae”. Four Seasons Hotel, Toronto, Ontario, Canada.

As Lecturer/Resource Person in International and Local Training Courses

13 July 2017. “Biotechnology in aquaculture”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

12 July 2017. “Possible impacts of climate change on aquaculture production”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

23 June 2017. “Marine fish hatchery operations”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

22 June 2017. “Marine fish broodstock management”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

5 October 2016. “Possible impacts of climate change on aquaculture production”. Specialized training course on oyster seed production, nursery and grow-out culture”. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

13 July 2016. “Biotechnology in aquaculture”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

12 July 2016. “Possible impacts of climate change on aquaculture production.” International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

06 July 2016. “Possible impacts of climate change on aquaculture production.” Special Training Course on Abalone Nursery and Grow-out Culture. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

16 June 2016. “Marine fish broodstock management”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

15 June 2016. “Marine fish hatchery operations”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

23 May 2016. “Possible impacts of climate change on aquaculture production.” Training Course on Mudcrab Culture. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

22 October 2015. “Possible impacts of climate change on aquaculture production.” Training Course on Mudcrab Nursery and Grow-out Culture. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

02 October 2015. “Possible impacts of climate change on aquaculture production.” Training Course on Mudcrab Hatchery and Nursery Culture Operations. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

01 September 2015. “Overview of the milkfish industry in the Philippines”. Special Lecture for a Study Tour of Fisherfolks Association of Masbate, Philippines. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

01 September 2015. “Overview of the culture of marine fishes”. Special Lecture for a Study Tour of Fisherfolks Association of Masbate, Philippines. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

22 July 2015. “Possible impacts of climate change on aquaculture production”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

21 July 2015. “Biotechnology in aquaculture”. International Training Course on Marine Fish Hatchery Operations and Management. SEAFDEC Aquaculture Department, Tigbauan, Iloilo. Philippines.

Feb 2014. “Status of Eel Research in Southeast Asia”. ASEAN-SEAFDEC Meeting. Bangkok, Thailand.

Oct 2012. Abalone Culture in the Philippines: Present Status, Problems and Prospects. National Fisheries Research and Development Institute Scientific Conference. Hotel H₂O, Manila, Philippines.

24 March 2011. Culture of Asian seabass. ASEAN Aquaculture Training Course. Research Institute of Aquaculture Number 1, Hanoi, Viet Nam.

23 March 2011. Culture of Rabbitfish. ASEAN Aquaculture Training Course. Research Institute of Aquaculture Number 1, Hanoi, Viet Nam.

Technical Assistance to Aquaculture Institutions and Industry

11-16 March 2013. Technical assistance for grouper hatchery operations and grow out culture in Myanmar. Department of Fisheries, Ministry of Livestock and Fisheries. Republic of the Union of Myanmar.

05-08 September 2006. Technical assistance for the assessment of the status of milkfish breeders in the Southern Breeding Center of Marine Aquaculture in Vung Tau, Research Institute for Aquaculture Number 2, Ministry of Fisheries, Viet Nam.

Recipient of International Research Grants/Involvement in Collaborative Research Projects

Title of research project: Developing technologies for giant grouper (*Epinephelus lanceolatus*) aquaculture in Viet Nam, the Philippines and Australia. **Duration:** 5 years (2013-2018); **Funding Agency:** Australian Center for International Agricultural Research (ACIAR); **Grant Amount:** AUS\$ 1,673,531.00; Served as Country Principal Investigator until May 2016.

Title of research project: Assessment of potential mariculture sites for selected focal areas in the Philippines – Part of Ecosystems Improved for Sustainable Fisheries Project (ECOFISH); **Duration:** 1 year (2017); **Funding Agency:** United States Agency for International Development (USAID); **Grant Amount:** PhP 1,055,000.00.

Title of research project: Aquaculture for food security and poverty alleviation and nutrition (AFSPAN). **Duration:** 3 years (2010-2013); **Funding Agency:** European Union thru FAO; **Grant Amount:** € 29,400.00; Served as Country Partner Team Leader.

Title of research project: Alternative feeding strategies for sustainable milkfish production in the Philippines. **Duration:** 3 years (2007-2009); **Funding Agency:** United States Agency for International Development – AquaFish Collaborative Research Support Program (USAID – AquaFish CRSP); **Grant Amount:** US\$ 66,000.00; Served as Country Co-Principal Investigator.

Title of research project: Improving growth and survival in cultured rabbitfish. **Duration:** 3 years (2001-2004); **Funding Agency:** United States Agency for

International Development (USAID); **Grant Amount:** US\$ 100,000.00; Country
Principal Investigator.

Title of research project: Poverty Alleviation through Aquaculture: Increasing Food and Income through Small-scale Marine Fish Farming. **Duration:** 2 years (2004-2005); **Funding Agency:** Australian Agency for International Development (AusAID); **Grant Amount:** Phil Pesos 1,500,000.00; Principal Investigator.

Served as Reviewer for the following Scientific Journals:

Aquaculture
Aquaculture International
Aquaculture Research
Asian Fisheries Science Journal
Comparative Biochemistry and Physiology
Fish Physiology and Biochemistry
General and Comparative Endocrinology
Journal of Fish Biology
Journal of Biotechnology

Served as Reviewer of Research Proposals for Grant Applications from the following Organizations

Department of Agriculture of the USA (USDA)
Bi-National Agriculture Research and Development of USDA (USDA-BARD)
Department of Agriculture-Bureau of Agricultural Research (DA-BAR)
Department of Science and Technology-Philippine Council for Agriculture,
Aquatic and Animal Resources Research and Development (DOST-PCAARRD)

Fellowships/Scholarships Received

Japan Society for the Promotion of Science (JSPS) - JSPS International Visiting Professor Award in the Tropical Biosphere Research Center, University of the Ryukyus, Okinawa, Japan, Sep 2005-May 2006.

Japan Society for the Promotion of Science (JSPS) – JSPS Post-Doctoral Fellowship in Laboratory of Molecular Endocrinology, School of Fisheries Sciences, Kitasato University, Japan, 1999-2000.

Kitasato University's International Fellowship Award – for Research Fellowship in Laboratory of Molecular Endocrinology, School of Fisheries Sciences, Kitasato University, Japan 1997-1999.

Monbusho Scholarship – for Graduate Studies for Doctor of Science in Zoology at the University of Tokyo, Japan, 1991-1994.