



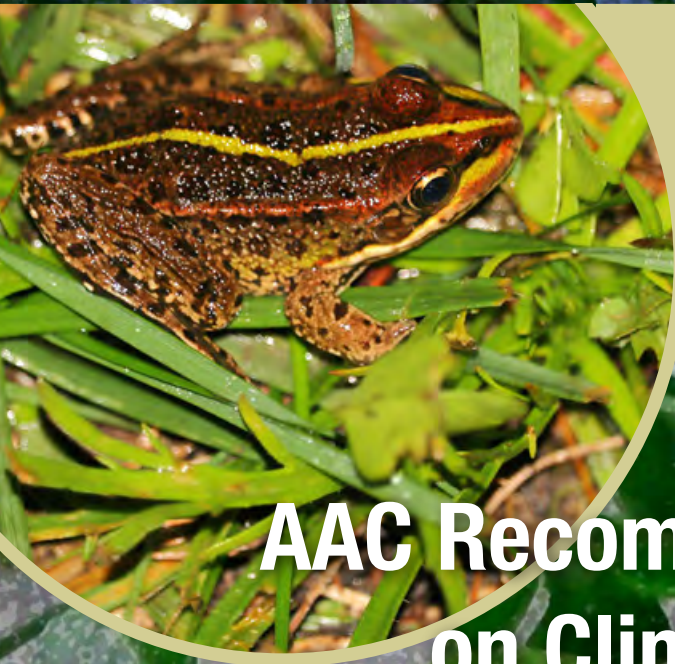
# aquaculture europe

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## AQUAPONICS in Finland



Status, challenges & future prospects



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Various aquaculture species of research interest on display at the Research Center for Marine and Land Bioindustry. Photo: BRIN

# Lessons from Indonesia

## Unveiling the secrets of a maritime colossus

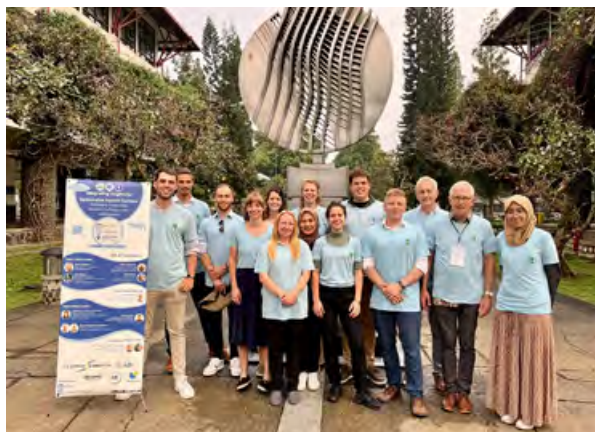
ELISAVET SYROPOULOU | OFFICE.AFI@WUR.NL

AQUACULTURE AND FISHERIES GROUP, WAGENINGEN UNIVERSITY & RESEARCH, THE NETHERLANDS

It has been almost 4 years since the last international trip of the Aquaculture and Fisheries (AFI) group of Wageningen University (WU). Every couple of years, the AFI PhD students knock on the door of their group leader and request for a knowledge exchange activity out of boarders in order to broaden their horizons and expand their network. After two formerly successful trips to Japan and China respectively, AFI students decided to visit to Indonesia. With the kind support of Wageningen University as well as the financial contribution of various sponsors, 12 WU students from the AFI and Environmental policy chairgroups travelled to the Southeast Asia to learn from a world's key player in the aquaculture and fisheries industries.

**“At Wageningen University we are aware of the vast amount of Indonesian knowledge on aquaculture and fisheries, and the enormous growth potential of Indonesia. We look forward to exchanging our ideas and together build on a Blue Future.”, shared the head of the AFI group, Geert Wiegertjes, with the hosts before the commence of the trip.**

The kickoff visit took place at the De Heus feed production plant in Bekasi. There, Kadi Mey Ismail, an AFI alumnus and current Project & Sustainability Manager of De Heus



The WU delegation to Indonesia consisting of 12 PhD students, the AFI chaigroup holder and an AFI senior researcher. Photo: Haniswita

Indonesia, welcomed the AFI delegation and walked them through the company's long history in animal nutrition. Even though aquafeeds accounted for ~30% of its production output in 2020, De Heus Indonesia managed to increase shrimp feed production from 15k to 20k tons in two-years' time and is currently considered one of the global leaders in the industry. Meeting the increasing market demand, the company had recently expanded its facilities, which participants had the opportunity to explore. Guests and hosts engaged in vivid discussions about future perspectives and sustainability in the sector. According to Kadi, floating feeds will become more prominent in the future while imported raw materials will be gradually replaced by local ingredients.

**“Even though shrimp is the most cost-efficient species in Indonesian aquaculture, finfish production still dominates, with African catfish being more common in the East and tilapia on the West.” - Kadi Ismail, Project & Sustainability Manager of De Heus Indonesia**

AFI students got an insight into the Indonesian educational system by visiting two distinguished universities in the Java area. Bogor Agricultural Institute (IPB) has a Fisheries and Marine Sciences faculty that offers 5 different study lines, among which the ‘Aquaculture Technology and Management’ program. A bit down the road, Insitut Teknologi Bandung



Kickoff visit to the De Heus feed production plant in Bekasi. Photo: Haniswita

(ITB) besides its long-established education in aquaculture, has recently introduced a new study program that includes one exchange year to a partner institution abroad, with Wageningen University being one of them. The activities of both Indonesian universities lie beyond education, as they both hold research facilities with great capacities. Biofloc technology in shrimp and tilapia is a common interest that they share which is however examined under different farming approaches: IPB works extensively with pond culture since it houses a total of 200m<sup>2</sup> fish pond area, whereas ITB focuses on developing closed aquaculture systems. Professor Gede Suantika in ITB stressed the importance of microbial management in land-based aquaculture through the successful results he recently obtained using a hybrid system which combines a zero-waste discharge system and a recirculating aquaculture system. Despite these promising findings, he highlighted that implementation and scaling of such innovative technologies necessitate knowledge transfer between research and industry.

**“Implementation of innovative technologies, like biofloc systems, necessitate knowledge transfer between research and industry. University is important to stay in close contact with the farmers in order to guide them to independency.” - Prof. Gede Suantika**

Embracing the same passion towards technological advances, Gibran Huzaifah founded the aquaculture tech startup named eFishery. Gibran walked the WU group through his inspiring journey which started more than 10 years ago while being himself a biology student enrolled in an aquaculture course. At the time, the success of his first business project to establish a catfish farm was compromised by the limited access to the market due to intermediaries. To gain leverage over the market demand, he created his own catfish food stands and soon expanded his production from one to 76 ponds! When his ambitions for further growth were arrested by the high feed costs involved, he came up with the idea of developing a technology for automatic feeding that would improve efficiency. The prototype feeders became popular

Photos: Donné Mathijssen



PhD students Anne-Jo van Riel and Tynke Siegersma gazing at black tilapia pond at IPB.

Fish pond culture of Nile tilapia variant at the IPB research facilities.

after farmers realized their potential and the advanced models came together with additional services that provide farmers with full control upon the production process. Revolutionizing the aquaculture supply chain, eFishery has brought together fish farmers, processors and harvesters in 27 provinces of Indonesia, and has recently launched its own shrimp brand. With over 2,000 employees, eFishery is now the largest feed distributor and financing provider in the Indonesian aquaculture scene, supplying domestic fish and shrimp while exporting to six countries.

**“It took almost 6 years to build communities and data, and it did create social friction. However, eFishery eventually integrated the middlemen in the process, providing transparency, fair prices, and logistical support.” - Gibran Huzaifah, CEO of eFishery**

Along the same lines, Aruna has been recruiting technology to promote small-scale fisheries since 2016. Founded by three graduates of the Telkom University, Aruna has tackled challenges related to quality control, supply chain management and data management. Providing tracker devices and selling apps, it allows fishermen to monitor fish stocks and reach out easily to their customers. To familiarize fishermen with this digital technology, it has employed “local heroes” that provide technical support on site. To further foster local communities and empower gender representation in the sector, it offers training and job opportunities especially



PhD students Ruben Groot and Eleanor Greenway receiving gift bags from Aruna representatives. Photo: Haniswita

for women. Alongside, Aruna is involved in various initiatives for the sustainability of Indonesian fisheries which involve restocking of natural fish populations and valorizing fisheries waste. Their future aim to establish MSC certified fisheries products is in line with current WU research projects on yellowfin tuna which are carried out in collaboration with Indonesian partners.



Besides private endeavors, the Indonesian government has been trying actively to bridge the gap between science and industry. The Marine Aquaculture Development Centre (Balai Perikanan Budidaya Laut) located in Lombok is a public institution which provides tailored technical guidance to fish farmers upon request. Hosting extensive and versatile facilities, it provides low-cost testing services and hatchery seed to local producers while it puts special emphasis on economically valuable marine commodities like pearl oysters and abalone.



Abalone attached to substrate during culture in indoor raceways at the Marine Aquaculture Development Centre. Photo: Donné Mathijssen



Students are explained the production cycle of white snapper at the Marine Aquaculture Development Centre. Photo: Donné Mathijssen

In close proximity someone may find the Research Center for Marine and Land Bioindustry, division of the National Research and Innovation Center, BRIN. The research taking place there focuses on various aspects of the exploitation of marine resources, utilizing a great diversity of marine species. The WU guests had the opportunity to familiarize themselves with seaweed and sea cucumber cultivation, low-trophic species of great interest for the diversification of aquaculture. Hosts shared details about their ongoing research during the joined symposium that WU co-organized with BRIN. The one-day event under the name “Connecting Dutch and Indonesian Expertise in Aquatic Research and Industry” included scientific talks and poster presentations from both institutes on the topics of shrimp farming and aquatic ecology. Industry was represented by two aquaculture companies, Hendrix Genetics and De Heus, as well as local



Outdoor flow-through tanks for seaweed culture at the Research Center for Marine and Land Bioindustry. Photo: BRIN

farmers. A special “Meet the expert” session was held, where shrimp farmers took one-to-one discussion with Ari Setiardi (Hendrix Genetics) and Marc Verdegem (WU), specialists on shrimp genetics and shrimp production systems respectively.

Knowledge exchange was also encouraged during another seminar organized in Bandung in collaboration with ITB. The event titled “Integrating Insights for Sustainable Aquatic Systems” was highly attended by local university students who had the chance to get introduced into a wide range of research topics. As part of the event and paying homage to IDH for its financial support, a “Women in Science” special session was organized. During her talk, researcher Magdalena Lenny Situmorang highlighted the importance of gender equality in science and, as a former awardee, she encouraged her fellow female colleagues to apply for the L’Oréal-UNESCO For Women in Science National Fellowship.



‘Shrimp farming and industry session’ as part of the joined symposium organized by WU and BRIN. Photo: Donné Mathijssen



ITB researcher Magdalena Lenny Situmorang answers questions about symbiotic application in shrimp farming. Photo: Eliza Syropoulou

All meetings and visits ended with gestures of appreciation from all parties and invitations to meet again on Dutch grounds. Hosts and guests promised to stay in contact and shook their hands on future collaborations.

After 10 days of exploring the potential of Indonesia as a maritime power, the WU delegation returned back to the Netherlands to share their experience with their fellow colleagues and put forward new ideas on how to place Europe at the forefront of global aquatic food production.

**“It was a very interesting experience which puts a lot of the things we do in Europe in a new perspective”, said Ruben Groot, Quality and Nutrition Manager at Alltech Coppens and PhD student at the AFI group, after the completion of the trip.**

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