DUTCH AQUACULTURE EXPERTS

Report on DAE activities at AFRAQ 2021

AFRAQ 2021 was the 1st Annual International Conference & Exposition of the African Chapter of the World Aquaculture Society which took place in Alexandria, Egypt from the 25th to 28th of March 2022.

The DAE (Dutch Aquaculture Experts) participated in this conference by (1) having a booth at the exhibition floor and (2) by delivering several presentations at the symposium "Circularity in African Aquaculture". The agricultural team of the Netherlands Embassy in Cairo provided financial and organizational support on behalf of the Ministry of Agriculture, Nature and Food Quality (LNV).

1. Promotion activities

Before the conference, the programme of the symposium was published in the conference program. Before the event, DAE participation in AFRAQ2021 was announced by the office of DAE through social media. During the conference booth visitors were informed about the symposium and a flyer with the programme of the symposium was handed out.

NL Netherlands

Symposium Circularity in African Aquaculture

Sunday 27 March 2022, 13:40 - 17:40

Opening by the Netherlands Ambassador His Excellency Han-Maurits Schaapveld

Sessions will be moderated by Dr. Melle Leenstra, Agricultural counsellor for Egypt & Jordan at the Embassy of the Kingdom of the Netherlands

13:40 **Circularity in Aquaculture: perspectives for Africa**
- Dr. Johan Verreth, Emeritus Professor, Wageningen University & Research

14:20 **Circular pond farming: The Nutritious Pond Concept**
- Dr. Marc Verdegem, Associate Professor and Researcher, Wageningen University & Research

15:00 **Opportunity study on circular proteins for aquafeed in Egypt**
- Mr. Kees van Dongen, VD Agri

Coffee break

16:00 **Dutch Aquaculture Experts: Expertise in sustainable aquaculture and recirculation technology**
- Mr. Andries Kamstra, Kamstra Consult - DAE

16:20 **Case studies Intensive RAS Tilapia farming: A tactical approach for intensifying aquaculture in Africa**
- Mr. Frans Aartsen, Holland Aqua - DAE

16:40 **Panel discussion**

Networking & refreshments

Registration required

Please use the registration link in your email or visit the NL/DAE booths 3&4 on the Afraq trade show

Hosted by the Dutch Embassy in Cairo, Egypt and the Dutch Aquaculture Experts

2. The DAE/NL booth

3. The DAE/NL symposium "Circularity in African Aquaculture"

Circularity in aquaculture

Dr. Johan Verreth, professor emeritus from the WUR (Wageningen University & Research) explained the principles of circular production, such as minimizing waste production and overall energy use, e.g. by recycling biomass streams. Implementing circular principles is not always easy and business

cases might be insecure. However, adopting circular principles in aquaculture will not only improve the health of planet earth, but also create many opportunities for innovation, intensification and improve social inclusion.

The nutritious pond concept

Dr. Marc Verdegem, Associate professor of the WUR stated that world-wide 79% of all farmed fish and shrimp are produced in ponds. Pond farming is that important because ponds are easy to construct and to manage. Challenges in pond aquaculture are its limited production capacity, biosecurity issues and its dependence on the availability of enough good quality water. Advantage of pond aquaculture is its adaptability to (one or more) species, its contribution to water and carbon storage, and its possible integration in agri-aqua systems.

Opportunities study on Circular proteins for Aquafeed in Egypt

Kees van Dongen (VD Agri) revealed that the fish feed production in Egypt is 2 million metric tons per year. With this feed 1,6 million tons of fish is produced. The ingredients for these fish feeds are generally imported. Hence, on behalf of the Netherlands Embassy in Egypt and with the help of

several Egyptian authorities and institutions, a study was carried out (by VD Agri and Aquaculture Experience) to search for local by-products which could substitute the presently imported fish feed ingredients. In a desk study three locally available alternative protein sources were identified: by-products of the chicken slaughtering industry, insect proteins and brewery by-products. The study identified the chicken industry by-product as a promising local candidate to substitute a substantial part of yet still imported fish feed ingredients.

Dutch Aquaculture Experts - Expertise in sustainable aquaculture and recirculation technology
Andries Kamstra (Kamstra Consult) operates as an independent consultant, but is also a member of DAE, the Dutch Aquaculture Experts. DAE is a knowledge and business platform of 19 Dutch enterprises and research institutes involved in aquaculture projects all over the globe. The DAE members offer a wide range of products and expertise:

- Fish feeds for all kinds of farmed species, advice on fish feed formulation, technical support for aquafeed production and fish nutrition research (both applied and fundamental)
- Design and construction of fish farms, delivery of equipment such as tanks, pumps and all kinds of water purification equipment
- Hatchery and production technology, especially for tilapia and African catfish
- Research, education and services can be delivered by research institutes, practical trainings on site can be provided, feasibility studies can be made, or tailor made trainings for professionals.
- Processing, market and logistics
- Health, quality and certification.

Case studies Intensive RAS farming – A tactical approach for Intensifying aquaculture in Africa
Frans Aartsen, Holland Aqua (also member of the Dutch Aquaculture Experts, DAE) has extensive experience with aquaculture projects in Africa. Aartsen took the design of a tilapia farm in Tanzania as an example. In Tanzania, the demand of fish was estimated in being 400.000 ton/year; this would require around 160,000 ha of ponds. Based on a case study comparing the performance of (1) traditional tilapia ponds, (2) RAS pond system and (3) RAS indoor system, it was concluded:

- Under Tanzanian climatic conditions, the RAS pond system and the RAS indoor system are similar in cost and production efficiency.
- Intensive systems need more electricity, higher quality feeds and educated staff to operate them.
- A higher initial investment in an intensive RAS system will lead to production of more fish on a smaller food print.

Panel discussion and closure
In a closing plenary session chaired by Dr Melle Leenstra (Agricultural Counsellor at the Embassy of the Netherlands in Cairo) several key issues of Egyptian aquaculture were discussed. As important issues for further development of Egyptian aquaculture sector were mentioned:

- water issues (water volumes available, water quality, legal rights to use water),
- the problem that almost all fish feed ingredients have to be imported,
- low profitability of fish farming (due to relatively high costs and low fish sales prices),
- summer mortality of tilapia and other biosecurity issues.

Egyptian stakeholders in the aquaculture sector mentioned that in their view potential cooperation opportunities can be found in:

- the construction and management of hatchery facilities (both marine and fresh water) and cages farming at sea,
- reducing costs of fish feed by minimizing expensive ingredients or substitute them by alternative (local) ingredients,
- development of integrated fish farming (desert farming, tilapia and shrimp polyculture).

Summary

The symposium was well attended with over 80 participants of which almost all stayed until the very last minute. In general it was concluded that the scarcity of water, land and inputs (such as fish feed ingredients) are obvious incentives to push the Egyptian aquaculture industry towards more circular and more intensive production methods in which the Dutch Aquaculture sector could play an important role because of its expertise in RAS and its focus on circularity.

4. Follow-up opportunities

Apart from the leads for individual DAE members the following follow-up opportunities for Dutch partners in Egyptian aquaculture were identified:

- Use of processed locally available poultry by-products in the manufacturing of fish feeds in Egypt.
- Integration of aquaculture and agriculture to optimize water usage/minimize water consumption,

demonstration and training.
- Working towards more circularity in Egyptian pond farming through application of the nutritious pond concept WUR, Egyptian farmers and Egyptian fish feed manufacturers
- Disease management and disease prevention
- Reproduction of fish – mainly salt-water hatcheries

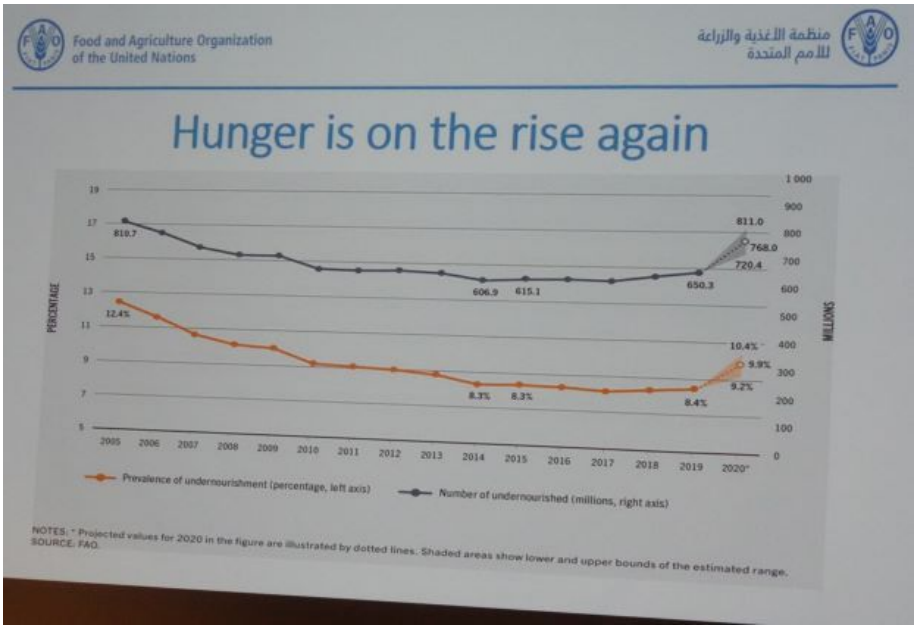
5. Background info

5.1 Aquaculture in Egypt

The selection of Egypt to organize AFRAQ2021 was a deliberate choice, as the Egyptian aquaculture is rapidly growing with an annual growth rate of 18% in the period 1997-2019. Over 7000 fish farms contributed to Egypt's aquaculture production of 1.6 million tons in 2019, which made Egypt the largest aquaculture producer of the African continent. Egypt's aquaculture produce comes mainly from ponds (87%), with minor productions in cages (12%) and rice fields (1%). Aquaculture production in RAS was only 2448 tons in 2019. Main fish species cultured are tilapia (66%), carps and mullets (28%) and seabass, seabream and meager (6%). With a population of 104 million habitants and a per capita fish consumption of 21 kg/year the Egyptian fish consumption slightly surpasses the annual fish production of 2.0 million tons (from both aquaculture and fisheries). Fish is an essential part of the daily diet in Egypt as it represents 54% of the nation's total animal protein consumption

5.2 Message of FAO at AFRAQ2021

According to FAO hunger is on the rise again.



Aquaculture as a producer of precious animal protein could have an important role in fighting hunger. However, the potential of aquaculture is not fully exploited yet.