



Painel

"Segurança Alimentar/ Inovação e Tecnologia - Diálogo de Líderes"

Fish farming is the most sustainable solution for producing animal protein for human consumption.

It has the lowest CO2 impact and fish are much more efficient than terrestrial animals at converting feed to protein.

With innovation and appropriate technologies, fish production can become even more efficient, non-polluting and sustainable.

01.- 03. September 2022

Colossal Fish

Food security the most violated human rights globally

Food security means that people have sufficient food to be able to live an active and healthy life at all times. This goal has still not been achieved for a significant proportion of the world's population. According to figures from the Food and Agriculture Organization of the United Nations (FAO), almost one billion people are currently hungry, i.e., they do not have an adequate food supply. More than two billion people suffer from an undersupply of micronutrients. This makes the right to food security one of the most violated human rights globally.

Aquaculture production is highly resource efficient

Aquaculture production is the most efficient and least polluting source of animal protein



Protein retention	32%	21%	18%	15%
Energy retention	23%	10%	14%	27%
Feed conversion ratio	1.1	2.2	3.0	7-10
Edible meat/100kg fed	61kg	21kg	17kg	4.10kg
Water consumption L/kg	1L	3.5L	7.2L	29L
CO2 (ton CO2/ton of protein)	9.8	42.3	56.7	337.2

Fish and Seafood is the **most CO² neutral form of animal protein**. Without aquaculture, the global demand for fish cannot be met today and in the future. Recirculated aquaculture systems play a key role in increased fish production

Fontes: EUMOFA „The Fish Market“ 2019, Euromonitor, FAO, Lux Reseach Inc., CBI; SEAFISH „Guide to Greenhouse Gas Emissions in Seafood“, EMBRAPA

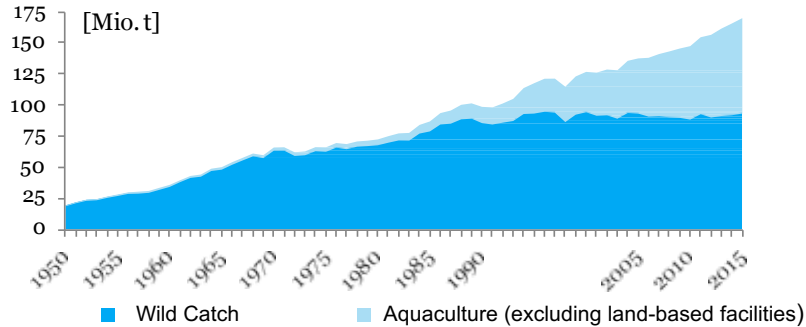
Fish and seafood an important supplier of animal protein

Fish and seafood are the most consumed form of animal protein, and thus play a significant role in human nutrition, especially in countries and regions with low meat supplies. Fish contain valuable amino acids, healthy unsaturated fatty acids and micronutrients. Fish can be preserved (dried, salted) with little effort and is a sought-after commercial item even in remote regions. Since fisheries are already fully exploited, the contribution of aquaculture to world nutrition is becoming increasingly more critical and can therefore be evaluated in terms of four aspects: quantity, availability, quality as a food source, and it's value in trade/income.

The demand for animal protein from sustainable aquaculture

Sustainable aquaculture is the basis for growth and stability of fish production

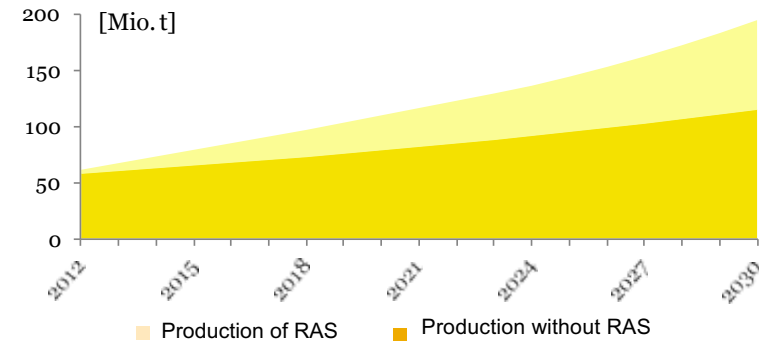
Quantity worldwide harvest of fish and seafood



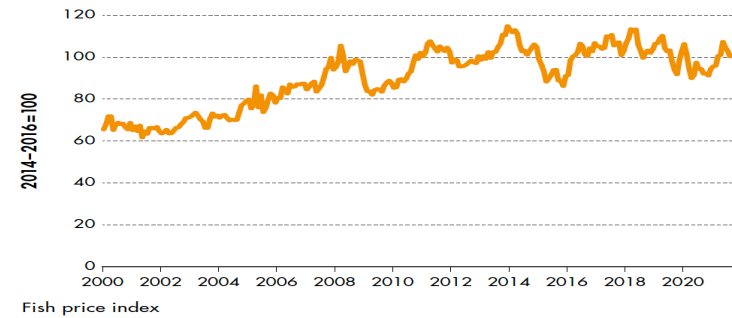
Remark

- ▶ Global fish and seafood production has grown rapidly, but 89.5% of natural fish stocks are fully exploited or overexploited. As a result, the growth in production since the 1990s has been mainly due to aquaculture production.
- ▶ Globally, 90% of fishermen are still artisanal and small scale and live in the developing world.
- ▶ Most of these countries do not produce enough fish to meet internal demand.
- ▶ Employment in the global fish sector has increased by 167% since 1980.
- ▶ Per capita income in fisheries in developing countries averages US\$ 1,750 per year - well above the poverty line of US\$1.25 per day

Sustainable RAS aquaculture production by technology (FAO)



Trade potential and fish price index world wide



Without aquaculture, the goal of reduction of global CO2 emissions cannot be met today and in the future. Recirculated aquaculture systems will play a key role in this objective.

Fontes: EUMOFA „The Fish Market“ 2019, Euromonitor, FAO, Lux Reseach Inc., CBI; SEAFISH „Guide to Greenhouse Gas Emissions in Seafood“, EMBRAPA

Strategic and Sustainable Implementation of Solutions

Food security requires different concepts in industrialized countries than in emerging and developing countries. In the industrialized countries, such as the USA and in Europe, it is conceptual approaches to solutions that come from NGOs and start-ups and can finance themselves from within the country.

In emerging and developing countries, some of which import 90% of their food supply, this access to financing is often not possible. Government programs and venture capital investments are often too short-term to deliver sustainable changes. Private capital could provide needed long-term support, however, bridging the gap between interested investors and sustainable projects in developing countries is difficult.

One innovative solution for private investors to gain access to development projects is through asset tokenization of projects using the Blockchain technology.

ColossalFish will fund its Pilot Project in Rio de Janeiro with the Swiss Rivoli Group and Rifinix, which we believe is the first “tokenization” of an aquaculture project.

Private and public sector access to international financing technologies

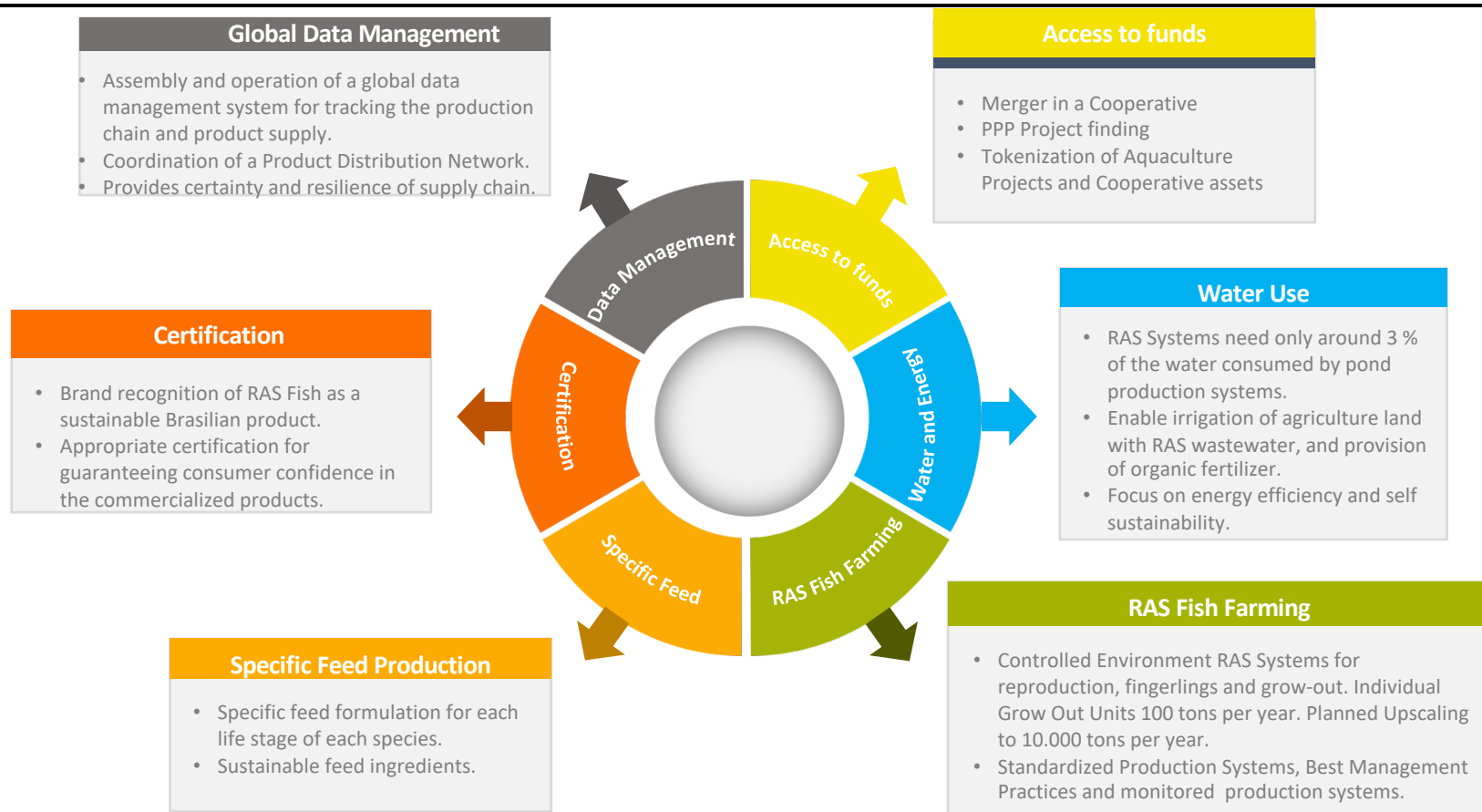
Rivoli Group is a Swiss private market investor specializing in the development, financing, and expansion of disruptive and dynamically growing companies, as well as strategic infrastructures, with a focus on companies whose business model requires a high level of innovation with socio-economic added value.

Rivoli's Swiss fintech subsidiary, Rifinex, as a first mover in the tokenization of private market assets, allows companies and organizations from both private and public sectors to market their projects internationally. Rifinex handles financing and refinancing, which are traded and managed through networked digital trading venues. This enables project funding with a global reach.

Tokenization is accomplished with cross-border blockchain technologies, thus costs and management become automated, cheaper and transparent. Smart contract application supports investor participation of issuers across jurisdictions.

Concept Technology Package for Fish Production

Leading and recognized technology among experts for land-based production of fish



Project Goal: Develop and provide an appropriate, standardized technology package for small and midsize farmers, that will make possible the sustainable production and commercialization (export) of various aquaculture species.

Notice and contact details

Thank you very much!

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