Alcimed

Press Release

Aquaponics

New opportunities for aquaculture and agriculture

Alcimed, consultants in innovation and development of new markets, is looking into the benefits that aquaponics may represent for the farmers of tomorrow.

Paris, 14 Avril 2016 – Aquaponics – combination of aquaculture and hydroponics[1] – was initially developed in response to the problems raised by intensive aquaculture. It may also become an alternative development route to conventional agriculture.

Growth in the global population and demand from emerging countries have intensified fish farming practices ...

"*Aquaculture has expanded exponentially over the last three decades to meet the growing world demand for fish, caused partly by the development of emerging countries. As a result, China has become the leading aquacultural producer, with 57%*[2] *of world production*," explains Mathieu Dublanchy, Alcimed Project Manager.

In 2014, for the first time, human consumption of aquaculture products exceeded that from sea fishing[3] (10.3 kg/person vs. 9.7 kg/person). This trend should continue: between now and 2030, 2 fish out of 3 will be produced without fishing.

... and caused environmental problems at the same time

However, the rapid development of aquaculture for species with high market value (salmon, prawn, etc.) has already given rise to environmental damage. In fact, 70% of global aquaculture is done in land facilities[4], able to affect the natural environment around the sites. Significant quantities of organic waste and waste water are discharged by the farms. For example, all the Scottish salmon farms discharge as much waste every day as Edinburgh's 600,000 inhabitants[5].

In addition, the concentration of animals may be such that many parasites and diseases develop around farming areas, affecting the direct environment of the pools. Intensive coastal farming can affect the chemical composition of the water and lead to rapid and untimely algal growth likely to be fatal to certain animals and harmful for man. In addition to the damage that can be caused to certain ecosystems, intensive aquaculture can put pressure on wild species, particularly through fish escaping from coastal farms.

Faced by the environmental and health issues created by intensifying aquaculture, aquaponics represents a more ecological alternative

Aquaponics is a combination of aquaculture and hydroponics (growing plants without soil using water enriched with mineral nutrients). Traces of it have been found among the Mayans two millennia before Christ. The process consists of recreating an ecosystem in which fish waste is used as natural fertiliser for the plants. Bacteria introduced by man convert the ammonia in the waste into nitrate that can be taken up by plants.

Aquaponics make it possible to overcome the main problems caused by aquaculture. In fact, fish waste is not discharged into nature and the water is recirculated in a closed system and completely

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[1] Soil-less agriculture
[2] "Global aquacultural production will overtake fishing" – *Les Echos* (6 February 2014)
[3] "Aquaculture overtakes fishing for the first time" – *L'Usine Nouvelle* (28 May 2015)
[4] "World situation of fishing and aquaculture" – FAO (2012)
[5] "Aquaculture" – SlowFood.com

recycled. The appeal of aquaponics therefore lies in its non-polluting aspect, in water savings (up to 90%), and in the fact that only a limited quantity of chemical fertilisers is needed for plant growth.

For about thirty years, the development of aquaponics was started particularly in Australia, the United States, Canada and Japan (e.g. 80% of aquaponic farmers are in the United States[6]). Production consists mostly of trout, combined with tomatoes and salad crops. The advantage of aquaponics is that it can be done anywhere, both in the country and in town.

Aquaponics can take three forms: domestic, small/local scale commercial (i.e. *Urban Farmers*, Zurich) or industrial scale (i.e. *FarmedHere*, Chicago suburb, the largest farm in the world, with 14,000 m^2).

Many different-sized players are developing in the sector, such as *ECF Farm System* (Germany), *Grow Up Urban Farm* (UK), *Culture Aquaponics Inc.* (Canada) or *JBA International Agritech* (Abu Dhabi). France, which at this stage only has start-ups or project sponsors (such as *Osmose*, *Aquaponie Valley* or *Aquaponic Management Project*), is 20-25 years behind North America or Australia in aquaponic farming.

Initially developed in response to the issues raised by aquaculture, aquaponics may represent an interesting alternative to conventional agriculture

Aquaponics enables organic and ecological agricultural production, with a limited need for chemical inputs. At a time when consumers are increasingly demanding eco-friendly products, aquaponics enables farmers to meet this demand.

In economic terms, fish production can be considered among the solutions to deal with the crisis in world farming. Using water recycling systems, the water saved by aquaponics is also a significant factor, particularly in hot countries such as Australia where water usage is frequently controlled.

Finally, with aquaponics, **the agricultural yield is considered greater than conventional agriculture**: with plants taking root in water, this growing method permits a large number of plants per square metre. Agricultural products are also considered to be of better nutritional quality, for example with much lower nitrate concentrations.

Nonetheless, **aquaponics is now reaching limits in terms of types de production**, as the systems do not allow tubers or sea fish (the most-sought species) to be produced. In addition, even if the principle is relatively simple, it remains complex to implement because it is based on the equilibrium in this artificial biocoenosis (agricultural, aquacultural and bacterial). Controlling this equilibrium is fundamental to achieving high productivity and good water recycling. Another point that could be worth reviewing: **aquaponic production cannot benefit from the 'organic' label according to current European regulations, which require growth in open ground.**

"*Still currently a niche market, tomorrow's farmers could gain many benefits from aquaponics, as much in terms of yield as in terms of quality of products. Consequently, aquaponics could transform the traditional and conventional agricultural activity, and promote the emergence of urban farmers and local circuits*", concludes Thomas Paschal, Director of the Alcimed Agro Business Unit.

ABOUT ALCIMED

Alcimed (www.alcimed.com) is a consultancy company in innovation and development of new

[6] "Aquaponics in the world" – APVIVA project

markets, specialised in life sciences (healthcare, biotech, food processing), chemistry, materials and energy, as well as aeronautics, aerospace, defence and Public Policy. Alcimed counts on a team of 180 employees, sub-divided by sector and able to handle extremely varied missions from marketing & sales subjects (market surveys, targeting new needs, positioning a new product, etc.) to strategic issues (development strategy, research & assessment of acquisition targets, organisation of an activity, design/assessment/deployment of public policies, etc.). The company's head office is in Paris and it also has offices in Lyon and Toulouse, as well as in Germany, Belgium, Switzerland, England and the United States.

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