

Global Trends of Organic Aquaculture

Sungchul C. Bai, Jun-Ho Lee

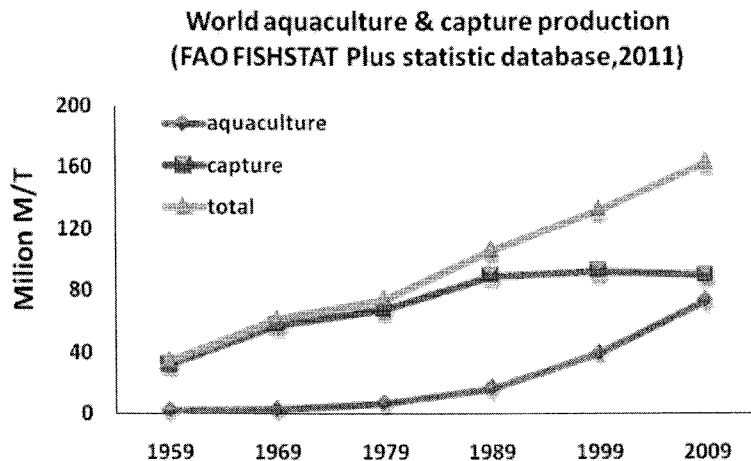
Pukyong National University, Korea

scbai@pknu.ac.kr

www.ffnrc.com

Key words: Organic aquaculture, environment, aquaculture, sustainability

Around one billion people are dependent on fish as their main protein resource, and their number is likely to increase further, since world population is increasing with an estimated annual population growth rate of 2.0%. Aquaculture now provides more than 22% of consumable aquatic products. Aquaculture production accounts for almost half of world fish supply. Asia contributes over 90% of global aquaculture production and plays a key role in the development of appropriate culture systems and technologies. Aquaculture production increases by 6-7% and it is expected to surpass capture fisheries production in the next 10 years. Aquaculture is at present the only growing sector within the fishing industry and is also reputed as the fastest growing food production sector in the world.



There is recently growing awareness of both consumers and producers for a responsible and sustainable aquaculture. Public opinion and regulation authorities in most of the export countries focusing now on the organic aquaculture.

The organic sector is booming, with the largest ever wave of farm conversions under way. Negative environmental impacts, safety issues for aquaculture products,

increased fish consumption and the increasing market share of organic foods have combined to focus attention on organic aquaculture.

Defining “organic aquaculture” is very much a work-in-progress and, for many reasons, an endeavor marked by controversy. Members of both the organic and the aquaculture communities disagree on how, or even if, aquatic animal and plant production systems can qualify as “organic” as the term is commonly used. Any potential definition must be a multi-faceted one. “Organic” in the context of food production connotes standards and certification a verifiable claim for the production process and production practices as well as more elusive characteristics such as consumer expectation for food quality and safety and general environmental, social, and economic benefits for farmers and for society. The variety of species produced in aquacultural systems and vast differences in cultural requirements for finfish, shellfish, molluscs, and aquatic plants add to the complexity of defining this sector. Some species and some production systems may prove quite difficult to adapt to a traditional “organic” system.

Theoretically, organic farming means letting the animal being raised grow according to its nature and at stocking densities that closely mimics its natural habitat. Organic aquaculture protects consumer health by reducing the overall exposure to toxic chemicals from pesticides that can accumulate in the ground, air, water and food supply. Organic aquaculture doesn’t use toxic pesticides also helps prevent top soil erosion, improves soil fertility, protects ground water, and conserves energy. In simple words organic aquaculture can be called as an approach for safer fisheries.

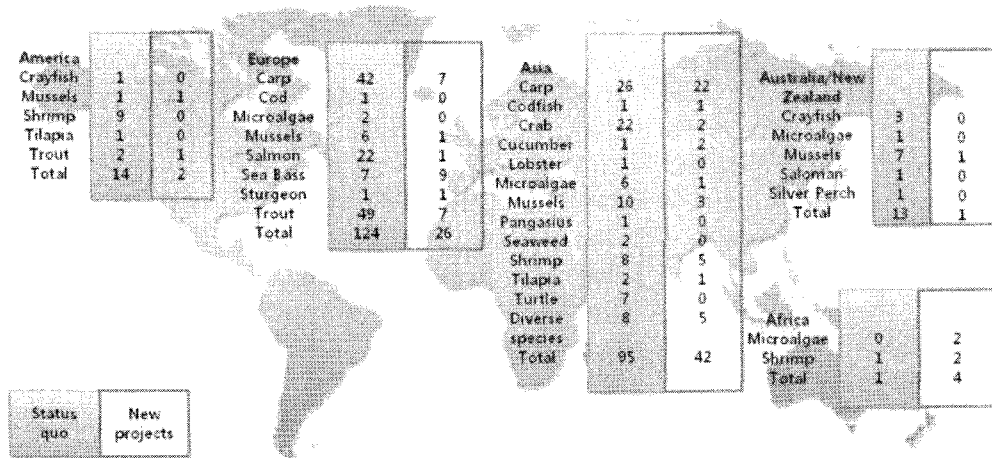
Traditional organic farming systems “rely on ecologically based practices, such as cultural and biological pest management, and virtually exclude the use of synthetic chemicals in crop production and prohibit the use of antibiotics and hormones in livestock production.” Sustainability, environmental stewardship, and holistic, integrated approaches to production are hallmarks of organic systems. Standards for organic cropping and terrestrial livestock husbandry practices have existed for decades. In recent years, standards have been incorporated into state and national organic rule making and certification requirements.

Historically, organic aquaculture is rooted in the organic agriculture movement, and these roots continue to shape the sector in many respects. Organic farmers and organic farming associations in Austria and Germany first started to develop extensive “organic” carp production systems in the early nineties (IFOAM Dossier Organic Aquaculture).

Organic aquaculture was responsible for an estimated US\$46.1 billion internationally (2007). There were 0.4 million hectares of certified organic aquaculture in 2008 compared to 32.2 million hectares dedicated to Organic farming. The 2007 production was still only 0.1% of total aquaculture production. The market for organic aquaculture shows strong growth in Europe, especially France, Germany and the UK - for example, the market in France grew 220% from 2007-2008. There is a preference for organic food, where available. Organic seafood is now sold in discount supermarket chains

throughout the EU. The top five producing countries are UK, Ireland, Hungary, Greece and France. 123 of the 225 global certified organic aquaculture farms operate in Europe and were responsible for 50,000 tonnes in 2008 (nearly half global production).

240 Organic Aquaculture Operations in 29 Countries (IFOAM Dossier Organic aquaculture, 2010)



Aquatic species, both animal and plant; ecological situations and locations; and various production systems, both marine and freshwater; are now under scrutiny in order to determine adaptability to organic production systems. Concern about the production and handling requirements that organic standards would impose and the overarching environmental impacts that organic systems attempt to address has pointed research and development efforts in some new directions. Current research activities with important implications for the organic aquaculture industry include: alternative feeds, especially protein sources from grain and oilseed plants; culture of low-trophic aquatic species; disease management and use of natural and alternative medicines; polyculture and multi-species systems; self-filtering systems; techniques for expanded recovery of fishery by-catch and waste for use in organic systems; implications of using closed containment systems; environmentally sound effluent management systems; and consumer studies related to food preferences and purchasing habits.

A great deal of research needs to be done into a number of areas around organic aquaculture. Current requirements usually stipulate a reduction in unsustainable fishmeal, in favour of organic vegetable and fish by-product replacements. A recent study into organic fish feeds for salmon found that while organic feed provide some benefit to the environmental impact of the fishes' life cycles, the loss of fish meals and oils have a significant negative impact. Another study discovered that certain percentages of dietary protein could be safely replaced

nutritional research should be more proactive, rather than reactive, with the hopes of increasing organic production of fish and shellfish for the growing consumer demand so that we can provide a safe, healthy and traceable food supply to the general public, as well as increased profitability for organic aquaculture production sector.

References

- Bagarinao, T. (1999). *Ecology and Farming of Milkfish*. Tigbauan, Iloilo: SEAFDEC - Aquaculture Department. 171p.
- Becker, K. & Focken, U. (1998). Resource utilisation by aquaculture in the tropics requirements of different production systems on the operational resources of fish farmers. *Animal Research and Development*, 48, 84-91.
- Dagoon, N.J. (2000). Whither aquaculture? *SEAFDEC Asian Aquaculture*, 22, 32-33.
- Feedinfo. (2005). *Hard-hit Thai Shrimpers Re-Think Quality Control, Some Go Organic*.
- Feedinfo News Service (26.04.2005). www.feedinfo.com
- Folke, C. & Kautsky, N. (1992). Aquaculture with its environment: prospects for sustainability. *Ocean Coast. Manage*, 17, 5-24.
- Guillaume, J., Kaushik, S., Bergot, P. & M^ltailler, R. (2001). *Nutrition and Feeding of Fish and Crustaceans*. Springer Verlag, Praxis publishing, Chichester, 407p.
- Lunger, Angela N.; Craig, S. R.; McLean, E. (June 2006), "Replacement of fish meal in cobia (*Rachycentron canadum*) diets using an organically certified protein", *Aquaculture* 257 (1-4): 393–399, doi:
- International Federation of Organic Agriculture Movements EU Group, Organic Aquaculture EU Regulations(EC)834/2007, (EC)889/2008, (EC)710/2009 Background, Assessment, Interpretation
- Naylor, R.L., Goldburg, R.J., Primavera, J.H., Kautsky, N., Beveridge, M.C.M., Clay, J., Folke, C., Lubchenco, J., Mooney, H. & Troell, M. (2000). Effect of aquaculture on world fish supplies. *Nature*, 405, 1017-1024.
- Pelletier, N; Tyedmers, P (2007), "Feeding farmed salmon: Is organic better?", *Aquaculture* 272 (2): 399–416
- Tomasso, J. & New, M. (1999). *Aquaculture in Global Fisheries Production*. Fisheries, 24,32.
- Williams, M.J., Bell, J.D., Gupta, M.V., Dey, M., Ahmed, M., Prein, M., Child, S., Gardiner, P.R., Brummet, R. & Jamu, D. (2000). Responsible aquaculture can aid food problems. *Nature*, 406, 673.