

## ICBA scientists manage to increase fish biomass by 300% using reject brine

**Dubai, UAE, June 7, 2018** – Through an improved, cost-effective inland modular farming approach in desert environments, scientists at the International Center for Biosaline Agriculture ([ICBA](#)) have achieved one of the highest fish biomass densities of Tilapia fish (30 kg per cubic meter) compared to previous growing seasons (10 kg per cubic meter), using reject brine (waste water) from desalination units.

Similarly, the seawater-based modular farm in the coastal region of the emirate of Umm Al Quwain, operated in collaboration with the Marine Environment Research Department (the Ministry of Climate Change and Environment, UAE), recorded an increase of fish biomass from 0.62 kg per cubic meter to 5 kg per cubic meter for Tilapia.

Furthermore, according to the latest data collected from an inland modular farm experiment at ICBA's station in Dubai, scientists found that the average weight of Tilapia fingerlings increased from 50 grams in December 2017 to 600 grams in May 2018 (five months) compared to ten months needed previously to reach the same weight. Therefore, the fish can have two growing cycles within a year, providing a great economic opportunity for local farmers and agripreneurs.

Moreover, the improved modular farm also contributed to reducing the cost of fish feed by decreasing the fish feed requirement from 2 kg of feed per 1 kg of fish to 1.1 kg of feed per 1 kg of fish. This was achieved after several interventions, particularly by improving the modular farm as per the technical advice of aquaculturists Mr. Efstathios Lampakis and Mr. Antonios Stoupakis.

Modular farming approaches focus on exploiting reject brine for fish farming and production of halophytes (salt-loving plants) on inland farms, and seawater and aquaculture effluents for cultivation of halophytes in coastal desert areas, bringing into production degraded or barren lands with economic benefits for local communities.

“One of the main goals of our research experiment is to develop a cost-effective production model that transforms reject brine and seawater into profitable sources for local farmers,” says Dr. Dionysia Angeliki Lyra, a halophyte agronomist at ICBA.

“For the last six months we have been working with the ICBA team to upgrade the infrastructure and the growing conditions of fish in the aquaculture system. Apart from reducing fish feed cost and increasing fish biomass, we have also been successful in decreasing the labor expenses. All we need is just one trained worker for a maximum of 2 hours per day to operate and maintain the system,” says Mr. Efstathios Lampakis.

While fresh water is scarce in coastal desert regions, there is plenty of reject brine, a by-product of desalination, and sea water. Every day more than 8.7 million cubic meters of desalinated water is used for irrigation and around 3.5 million cubic meters of reject brine is produced globally. Largely discarded as wastewater, if not disposed of or managed safely, reject brine is a serious environmental threat.

ICBA, however, views reject brine and sea water as alternative sources for irrigation. The center operates inland and coastal modular farms, also known as integrated aqua-agriculture systems (IAAS), to study the use of reject brine and sea water for aquaculture. The inland modular farm uses desalinated water for vegetables, reject brine for Tilapia and seabream, and aquaculture effluents for

halophytic plants, while the coastal modular farm uses sea water for fish and aquaculture effluents for halophytic plants.

The research is supported by a grant from the Expo 2020 Dubai's Expo Live Innovation Impact Grant Program.

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### **About ICBA**

The International Center for Biosaline Agriculture (ICBA) is an international, non-profit research-for-development organization that aims to strengthen agricultural productivity in marginal and saline environments through identifying, testing and facilitating access to sustainable solutions for food, nutrition and income security.

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