

Technical and environmental analysis of shrimp farming in the Jaguaribe river estuary, Ceará State, Brazil.

Ítalo Régis Castelo Branco Rocha¹, Tadeu Dote Sá^{2,3}, Rommel Rocha de Sousa⁴,
Gutemberg Costa de Lima⁴, Francisco Hiran Farias Costa⁴,

¹Federal Institute of Education, Science and Technology of Ceará – CE, 60115-282, Brazil

²Geoconsult – Geology and Environment Consulting, Fortaleza – CE, 60120-002, Brazil

³Center of Science and Technology, University of Fortaleza, Fortaleza – CE, 60811-905, Brazil

⁴Department of Fishing Engineering, Campus do Pici, Federal University of Ceará, Fortaleza – CE, 60455-760, Brazil

Abstract

Despite the economic importance of farmed shrimp, a number of technical, environmental, economic and social problems have been widely reported in the international literature. This paper focuses on the environmental and socio-economic impacts of semi-intensive and intensive shrimp farming in the coastal region of Northeastern Brazil and the identification of options for sustainable production. In this Region, the total area dedicated to shrimp farming is approximately 18,500 ha, of which 5750 ha are located in Ceará State. The estuary of Jaguaribe river has the largest number of shrimp farms in the state of Ceará. Currently, the industry has 64 participating farms with a total area dedicated to shrimp farming of 2411.3 ha. In 2011, the total production was 13,110 tons of shrimp with an average yield of 6.3 ton ha⁻¹ year⁻¹ in a pond area of 2071.2 ha. This industry employs 2350 people that represent 23.2% of jobs generated in the two municipalities where the Jaguaribe river estuary is inserted. Compared with other countries, Brazil has reduced its exports due to high cost inputs for shrimp farming. However, the Brazilian shrimp industry has benefited from high domestic prices, despite the decreases in international price of shrimp. In 2011, the prices for size category ranged between US\$ 4.67 - 6.04 for 80/100 (count of head-on shrimp), US\$ 4.95 - 6.60 for 70/80 and US\$ 5.85 - 8.10 for 50/60. The major environmental impacts in this industry have focused on the water pollution and loss of mangroves. However, no change in parameters of water quality was observed during the period 2010-2012, indicating that this estuary has some capacity to process pond-derived nutrients while only 3.7 ha of mangrove forests were used to shrimp pond. The results of this investigation demonstrate that Brazilian shrimp industry requires improved management and development policy for a sustainable growth.

Keywords: Shrimp Farm; Mangroves; Impacts; Environmental; *Penaeus vannamei*