USE OF GEOGRAPHIC INFORMATION SYSTEMS IN THE SELECTION OF AREAS FOR MARINE FISH FARMING IN COASTAL PERNAMBUCO, BRAZIL

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Given the recent interest towards developing marine fish farming along the Brazilian coastline, this study evaluated the physical, chemical and biological characteristics, as well as the conditions of infrastructure and legal aspects, to identify suitable sites for offshore marine fish farming in the coast of Pernambuco. These characteristics were divided into three criteria (water quality, security and infrastructure), while constraints related to legislation, and the traditional use of some areas for fishing, navigation and diving were also considered.

Environmental data (dissolved oxygen, temperature, pH, salinity, transparency and concentration of nutrients) were obtained from the JOP's Project, Department of Oceanography, UFPE. Data on the composition of the sediments were obtained from the Geological Survey of Brazil - CPRM, Project *Granulados Marinhos da Plataforma Rasa do Brasil*. The geographic location of ports and the industrial network of the state of Pernambuco were obtained from the Laboratory for Georeferencing - ITEP, Recife, Brazil. The bathymetry data were collected from digital nautical charts (scale of 1:100,000) from the *Diretoria de Hidrografia e Navegação* (DHN - Brazilian Navy). Wave heights and water currents were obtained from the Department of Oceanography - UFPE and Department of Fisheries and Aquaculture - UFRPE, respectively. All data were processed using the software ArcView (version 9.2) and analyzed through a comparison of parity between the factors and criteria chosen to identify of suitable sites for offshore marine fish farming, a process of hierarchical analysis. Two researchers and one member of the state environmental agency responded a questionnaire on which importance weights were assigned to each factor or criterion in a percentage scale. This was then used for the preparation of maps and statistical analysis. A literature review was done to define the minimum and maximum limits, relating each factor to the culture of cobia (*Rachycentron canadum*). Using the Boolean method, coastal areas pertaining to conservational purposes, navigation, diving and traditional fishing were restricted.

The criteria relating to water quality and security were presented as very suitable for cobia culture and therefore had no significant contribution on the definition of suitable sites. To meet both legal and economic feasibility of the activity, only areas with depths between 20 and 40 meters were considered here. Thus, the factors related to the criterion Infrastructure contributed differently to the selection of the suitable sites. The study area covered 5,094 km^2, of which 29% were considered very suitable, 49% moderately suitable, while no areas were identified as unsuitable for the installation of offshore marine fish farming in the coast of Pernambuco. Around 22% of the area was restricted to offshore aquaculture due to the presence of conservation areas, or because of their traditional use as fishing grounds, navigation and diving. Although a considerable portion of the coastal area in Pernambuco is considered suitable for offshore marine finfish farming, it is of paramount importance to update and refine the data in order to more precisely define the most suitable sites for offshore marine fish farming in coastal Pernambuco and elsewhere.