

ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR A NEW EXPERIMENTAL STATION FOR AQUACULTURE RESEARCH NEAR PALMAR (PROVINCE OF GUAYAS, ECUADOR)

Calewaert Jan-Bart

UGent/VUB (Ecomama)
Pleinlaan 2, B-1050 Brussel, Belgium
Unesco Centrum Vlaanderen, afdeling Antwerpen
Kasteelstraat 49, 2000 Antwerpen
E-mail: jbvub@yahoo.co.uk

The Ecuadorian Laboratory for Aquaculture and Marine Research (CENAIM) is constructing a new 25 ha station for aquaculture research at a former shrimp farm near Palmar. The most striking feature in the area is a 36 ha mangrove. This study was conducted to produce an Environmental Impact Statement (EIS) for this project with two primary goals: (1) the identification of potential impacts on the total environment; and (2) the elaboration of a monitoring and mitigation plan to reduce the predicted negative impacts. Potential impacts were identified using conventional EIA techniques. An environmental impact matrix was based on a similar study in Tanzania while level of risk matrices were based on Australian and New Zealand standards for risk management. For water quality laboratory analysis, chlorophyll a, nutrients (TP, TAN and TN) and BOD were measured with standard methods and protocols as described by the American Public Health Association (APHA) while pH, DO, salinity and temperature were measured *in-situ* with basic equipment. Both the soil samples (filtrates) and water samples were analysed for (1) organic compounds using a Gas-Chromatograph and Mass Spectrometer; and (2) trace elements using an Inductively Coupled Plasma Atomic Emission Spectrometer. Analysis revealed relatively high copper concentrations in soil of the site (average of $36.31 \mu\text{g.g}^{-1}$) probably because of earlier use of copper sulphate for algal control. Exceptionally high levels of boron were observed for both water and soil samples and further investigation is needed to determine the cause. Hexachlorobenzene (HCB) was present in some soil samples, but the concentrations are considered to be below acceptable limits. Socio-economic screening revealed no major objections from local communities against the project. However, several potentially negative impacts were identified including noise pollution, reduced access to pristine seawater, oil and fuel spills and the disposal of feed bags. One of the most important mitigative measures that will be implemented is the use of a 4ha constructed wetland. In addition, more than 1,000 mangrove seedlings will be planted in the wetlands and reservoir. There are also several positive consequences associated with the project including employment and scientific research opportunities. We believe that when all proposed mitigation measures are properly implemented, the suggested project can run a socially and environmentally responsible operation. To make sure it does on the long term, a monitoring program is proposed that provides feedback on the environmental and social protection measures. Problems that are identified by monitoring should be corrected as the project develops and operates.