

1. The project consists of the expansion of ERSA's shrimp farming operation from 3,796 net ha to 4,196 net ha of ponds through the development of 400 ha of shrimp ponds at La Tola in the Province of Esmeraldas. The project will (i) improve the Company's response to the growing demand for aquaculture products, (ii) assist the Company in its proactive approach to disease management by implementing a bio-security program and (iii) better utilize available capacity in its processing plants.
2. This is a category III project according to IIC's environmental review procedure because specific impacts may result which can be avoided or mitigated by adhering to generally recognized performance standards, guidelines or design criteria. The review of this project consisted of appraising technical and environmental information submitted by the project sponsor, as well as site visits. The following potential environmental, social, health, and safety impacts of the project were analyzed:
  - habitat loss and other impacts arising from expansion of production areas;
  - farm management and production issues;
  - water use and waste water management from production and processing activities;
  - solid waste management and disposal;
  - occupational health and safety issues and labor practices;
  - land acquisition process and possible impacts related to physical and/or economic displacement and impacts to cultural heritage;
  - wider social commitments and activities.
3. The information provided about how these issues and potential impacts have been addressed in the development of the project are summarized in the following paragraphs.
4. Habitat loss and other environmental impacts arising from expansion of production areas: The La Tola site has all the necessary government permits to develop an aquaculture project. Land use and habitats at the time the sponsor acquired the site comprised a mix of cattle grazing, fruit trees, mangrove and other forest, and pre-existing aquaculture development. Most of the site had been significantly affected by previous human activity, and the sponsor has agreed to protect remaining areas of forest including all mangrove habitat. Accusations that the sponsor had cut mangroves were investigated by the government agency with responsibility for coastal management (Programa de Manejo de Recursos Costeros- Unidad de Conservación y Vigilancia - PMRC/UCV) and have proved to be unfounded. The sponsor cleared 20-25 ha of nato (*Mora megiosperma*) trees adjacent to the mangrove for pond construction. Clearance of these trees is acceptable under Ecuadorean regulations. There is an estimated 34,200 ha area of nato, mangrove, and other habitats (as well as cattle grazing land) in the adjacent Reserva Ecológica Manglares Cayapas-Mataje, and the sponsor has undertaken to protect and manage the remaining areas of nato-dominated habitat (51ha) within the La Tola site. Implementation of the management plan for these habitats will be a Condition of Disbursement for the project. The potential for ecological impacts around the project area (particularly the Reserva Ecológica Manglares Cayapas-Mataje across the River Cayapas north of the site and the Laguna de Ciudad wetland 6 km south of La Tola) have been assessed by the sponsor and reviewed by Ecuadorian authorities. No significant risks are envisaged.
5. Farm management and production issues: A semi-intensive stocking system is proposed (9 -15 post larvae/m<sup>2</sup>) and the principal production species will be *Panaeus vannamei* (with some use of *P. stylostris*). Both species are native to Ecuadorian waters, and there is no risk of introduction of non native species. The sponsor used to obtain a varying amount of shrimp in post larvae (pl) from wild caught sources, and there has been monitoring of post larvae and other zooplankton stocks by Ecuadorian agencies, which demonstrates that there has been no long-term impact on marine fauna or ecology as a result of post-larvae harvesting. The sponsor's plans are to move towards hatchery reared stock and to avoid use of wild caught post larvae and the company is actively pursuing virus /disease control through the identification of Specific Diseases Resistant Stock in its hatchery bred post larvae (see also

- section 14). The group operates four hatcheries near Salinas, which provide post larvae for the company's farms, and all hatcheries have the requisite permits and government operating permits. One of the schemes for improving bio-security will introduce tilapia into the ponds to remove dead shrimp and hence reduce the opportunity for the spread of disease. The tilapia that will be placed in the ponds will be of the same sex to prevent reproduction, and they will be harvested with the shrimp to prevent their release to the wider environment.
6. The sponsor uses a limited range of standard industry agrochemicals, and use and management are satisfactory. Pesticide use is restricted to dipterex (which is applied to pond waters after filling and before stocking to reduce zooplankton levels and which is completely removed from the pond system within 8 days), and there is no release to the wider environment. After harvesting, residual ponds are treated with chlorine to kill off fish and invertebrates; once fully dry, pond areas are treated with chlorine, CaCO<sub>3</sub>, or CaHO<sub>2</sub>. There is no use of antibiotics at any of the sponsor's hatchery sites and antibiotic use in ponds is undertaken in a controlled and acceptable manner.
  7. Water use and waste water management from production and processing activities: Water for the La Tola site will be extracted from the Río Cayapas, whose water supply is adequate and sustainable. The nearby (1km) community of La Tola (pop. 3,500) draws water from a shallow aquifer that underlies parts of the La Tola site, and the company has commissioned research to determine the extent and sensitivity of the aquifer and to provide recommendations for its protection. As a result, a 450 m cordon sanitaire has been established around the three wells that service the community, and the sponsor will maintain fruit and other trees in this area. The sponsor will jointly monitor well water quality with the La Tola community to ensure that the project does not affect water quality. The members of a community immediately adjacent to the farm (El Cuerval, pop. 300) obtain some of their drinking water from the river at low tide. This community's connection to the main wells described above failed three years ago and has not been repaired. As part of its commitment to local communities, the sponsor will provide potable water supplies to this community by truck.
  8. Wastewater from the La Tola ponds will be treated in discharge channels that work as settling ponds prior to discharge to the Río Cayapas (possibly via the mangrove forest). This method of treatment for semi-intensive ponds provides adequate treatment of shrimp farm effluents and will be in compliance with World Bank and international standards. Hatchery wastewaters have low Biochemical Oxygen Demand (BOD), and suspended solids and are discharged either to a series of artificial wetland lagoons or to drainage channels that discharge into salt ponds. Effluents are in compliance with IIC's Environmental and Labor Policy and with World Bank requirements. Packing plant effluents are discharged directly to the sea at Esmeraldas and the Guayas Estuary in Guayaquil and Quiñonez. The sponsor is in the process of installing package wastewater treatment systems for each site that will meet Ecuadorian standards, IIC and World Bank Group requirements. These improvements and the timetable for installation will be described in a Environmental Management Plan (EMP) that will be reviewed by IIC prior to disbursement.
  9. Solid waste management and disposal: Solid waste from the hatcheries is reused or disposed of at local landfills. At the farms, it is disposed of to on-site landfills. These are rather rudimentary, and improvements in management and siting will be undertaken as part of the project and will be described in the EMP. Solid waste from processing plants is either used as feed (shrimp heads and other organic material), reused (cardboard) or disposed of to landfill.
  10. Environmental management systems (EMS):. The company has an HACCP system for each of its packing plants and is working towards ISO 9000 and ISO 14000 for all its operations. It is a member of the Global Aquaculture Alliance (GAA) and has committed to the codes of best practice for responsible shrimp farming (Global Aquaculture Alliance (GAA) (1999) Codes of Practice for Responsible Shrimp Farming, promoted by the GAA).
  11. Occupational health and safety and employment issues: Occupational health and safety is

adequate but does not conform to industry best practices. As part of the project, the sponsor has committed to improving flooring in the packing plant cold rooms as well as improving working conditions at a number of other points in the packing process. Per company policy, all farm site employees are housed on site. As part of the project, the sponsor has committed to making improvements to accommodation at the new farm site and also throughout the company's other farm sites. Improvements in occupational health and safety (and related issues) will be described in the EMP and will be reviewed by IIC prior to disbursement.

12. Land acquisition process and possible impacts relating to physical and/or economic displacement and impacts to cultural heritage: Land for the project in La Tola has been acquired on a willing buyer/willing seller basis. A total of 855 hectares were bought from companies and individuals that had title to their land, and an additional 200 hectares were acquired from 14 individuals who had rights of possession but no title. After the purchase of the rights of possession, El Rosario obtained legal title through the Instituto Nacional de Desarrollo Agrícola. Thus, 1,054 ha have been acquired by the sponsor, which represents 95% of the planned land acquisition at the site. The remaining land will be purchased through willing buyer/willing seller arrangements, and the project will not result in any involuntary resettlement or economic displacement.
13. Archaeological surveys of the site have been undertaken by the Instituto Nacional de Patrimonio Cultural del Ecuador (INPCE), and a number of areas with possible archaeological significance have been located. INPCE has requested that prior to development of these areas, additional assessments be undertaken and salvage of archaeological artifacts be undertaken in accordance with Ecuadorian requirements. The sponsor has accepted these requirements.
14. Sponsor's wider social commitments and activities : When the sponsor started operations in Esmeraldas province (1994) it created the El Rosario Foundation, which has been involved in tree planting, school construction and staffing, as well as the construction of a police station. More recent activities associated with the La Tola site include construction of a school in 1998-99 that currently serves 90 children. The Foundation also pays for one of the school's three teachers.
15. There are an estimated 100,000 post larvae catchers in the country and there is uncertainty over the contribution of "wild harvesting" income in relation to total cash/livelihood generation. Although the sponsor's responsibilities to wild-catch harvesters and artisanal fishermen is indirect and non contractual, the El Rosario Foundation will sponsor a socioeconomic study of post larvae catchers in order to assess the possible impacts of potential changes to livelihood so that impacts of an industry-wide move towards hatchery reared post larvae can be determined.
16. IIC will monitor ongoing compliance with its Environmental and Labor Policy during the lifetime of the project by evaluating reports submitted annually to IIC by the sponsor and by conducting periodic supervision. In particular, IIC will require annual confirmation:
  - of the implementation of the mangrove/nato management plan (including details of mangrove and nato extent and health);
  - of pesticide (and other agrochemical) use and management practices as well as details of the pests controlled;
  - that the company is meeting national, and World Bank requirements for solid waste handling and disposal and waste water quality (from farm and processing sites) as described and agreed in the EMP for the project;
  - of freshwater quality data from the La Tola well sites and confirmation that the community of El Cuerval is still being provided with water by the company;
  - that the sponsor is implementing improvements to working conditions and practices as described and agreed in the EMP for the project;
  - that archaeological /cultural heritage is being addressed as per Ecuadorian requirements; and

- of the progress in implementing the company's ISO 9000 and 14000 management systems.
17. Based on its review of available information regarding potential environmental impacts and proposed mitigation measures, IIC concludes that the proposed project will meet the requirements of its Environmental and Labor Review Policy and host country requirements.