

# Conceptual Design of Hatcheries Kingdom of Saudi Arabia

## Project Characteristics

- Conceptual design of shrimp and fish hatcheries
- Identification of basic criteria and species
- Description of project components
- Preliminary estimates of equipment costs
- Review of 60% design drawings

A series of projects are being developed by Saudi Aramco identified as Marine Environmental Projects (MEP) in the Arabian Gulf. Saudi Design and Consulting Office (SCADO) have the responsibility for implementing these projects. SCADO contracted with Woods Hole Group Middle East (WHGME) for the conceptual design of the shrimp and fish hatcheries for stock enhancement in the Arabian Gulf that are an integral part of the MEP Program.

The team includes Dr. Lewis LeVay, Head of Marine Biology Group at the Centre for Applied Marine Sciences at Bangor University, and Dr. Mark Rigby, Technical Director of Llyn Aquaculture Ltd., in Wales, United Kingdom.



## Proposed Location of Hatcheries

The team conducted a series of investigations to develop the assessment and suitability of the location of these facilities on Abu Ali Island in the Arabian Gulf off the eastern coast of the Kingdom.

The basic criteria for the conceptual design included species, scale of production, seasonal production, and specialized requirements for a stock enhancement hatchery.

As the project developed, the project components were identified including the number, size, and configuration of the tanks and water treatment aspects as well as the support facilities and required buildings.

Conceptual drawings were developed that included plans, elevations, and general layout of all facilities and buildings. Based on this information, a preliminary estimate of the cost of equipment were prepared. Recommendations were also prepared for the operation and maintenance of the facilities.

The scale of the shrimp hatchery is designed as a module with a capacity of 50 million PL<sub>45</sub> per eight (8) months for restocking of *Penaeus semisulcatus*. This output could be increased to 100 million by adding a second module without further infrastructure improvements.

The proposed scale of the fish hatchery will be 1 to 4 million fish (depending on the species selected) at up to 5 g per eight (8) months for restocking. The design includes capacity for production of an additional 2 million fish at 1 g for sale to farms to provide an additional source of revenue to support operation costs. The species that may be produced are:

- Sobiaty bream *Sparidentex hasta* (*Acanthoagrus cuvieri*);
- Mullet (*Liza macrolepis*, *Liza spp.*);
- Safi, Rabbitfish, Spinefoot (*Siganus canaliculatus*, *S. rivlatus*); and
- Hamour, Grouper *Epinephelus coioides* (*E. tauvina*)

Based on these recommendations, SCADO completed the final design of the proposed facilities in June 2009.