

## A SUSTAINABLE GEO-SPATIAL EXPANSION OF SHRIMP FARMING IN ENCLOSED COASTAL SEA

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A spectacular growth of shrimp farming in enclosed coastal seas in Thailand has been shown up within last three decades. Starting from Upper Gulf area the scenario can be found similar in Pak Phanang Bay, Ban Don Bay, Phang Nga Bay and Lower Songkla Lake. This article attempts to come out with environmental pitfalls and management issues related to this geo-spatial expansion, which is done mostly in unplanned way. Besides it has been envisaged to interrelate the scenario with its kind in India by presenting a case study 'carrying capacity for shrimp farming: lessons learnt from Coastal Andhra, India'.

Shrimp farming in Kandleru creek area, Coastal Andhra has also shown a tremendous growth within last decade. The economic prosperity, the underneath main driving force for geo-spatial expansion, has brought a significant negative impact on this promising sector. There has been a concern of significant deterioration of creek water quality due to shrimp farming that appears to be the serious shrimp health problems faced by the farmers. The sector was facing regular disease outbreak since 1994. Since the expansion around the creek had left natural resources degradation besides significant deterioration of creek water quality, the area once found as most ideally suited for shrimp culture has later been questioned for its sustainability. Hence, it has been assumed that the shrimp culture may have crossed the carrying capacity of the creek.

Remote Sensing and Image Enhancement techniques have been applied to compute and assess the booming and clustering of shrimp farms in case study site during 1988 to 2001. Study confirmed the land cover changes noticed during that time frame using IRS LISS-II, LISS-III and PAN image interpretation equipped with detailed field investigation. For assessing the carrying capacity a nutrient input model was developed based on shrimp farming input data and water quality of discharged effluents into the creek. The results revealed that during 13 years new shrimp farming areas have increased by 91%. The nitrogen load, calculated as the main nutrient load and the limiting factor for carrying capacity in brackish water condition, into the creek is diverse from upstream area to downstream area subject to flushing time and tidal influence. The carrying capacity calculation has been made for 3 zones (based on salinity profile and tidal amplitude) and a preliminary assessment has resulted with red signal for shrimp farming along the Kandleru creek area. The lessons learnt from the case study has been used to make recommendations that might play a significant role for the future strategic planning of shrimp farming sector in any coastal seas.