

## Ecosystem Rehabilitation Effects by Large Scale Mangrove Planting to Abandoned Shrimp Ponds in Thailand -Estimation of Carbon Accumulation and Food Web Analysis-

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### Summary

Secure carbon fixation method from atmosphere without input energy is photosynthesis of plants. UNEP reported that abilities of sequestration and fixation of carbon as *Blue Carbon* at salt marshes and coastal ecosystem in natural ecosystems is very high. Especially, mangrove forests can store carbon 2 to 3 times higher than tropical rain forests. Mangroves are salt-tolerant forest ecosystems found mainly in the tropical and subtropical intertidal regions of the world. Mangrove vegetation is the most efficiently adapted biotic community in response to climate-change-induced sea-level rise.

Kato and his research team had planted mangrove seedlings to abandoned shrimp ponds of 1,000ha for 10 years since 1997 at Nakhon Si Thammarat Province in southern Thailand. Now they are planting mangrove at new mudflat areas of Pak Poon in Nakhon Si Thammarat. Total planted area and planted mangrove seedling are over 1,300ha and 8,000,000 seedlings, respectively. The growth of planted mangrove is very good and many kind of fishes, animals and birds return to mangrove planted areas. The recurrence of fishes, crabs and shrimps are very important income for local people and they are also very important resources as animal protein.

Research aims were to glean as follows; chemical properties of soil, amount of carbon and nitrogen in soil, biomass production (above ground and below ground) at abandoned shrimp ponds and new mudflat areas in Nakhon Si Thammarat. The food web studies at mangrove planted areas of abandoned shrimp ponds and new mudflat areas were also studied through stable isotope <sup>13</sup>C and <sup>15</sup>N in fishes, shrimps and crab. Evaluation of mangrove planting was discussed about coastal ecosystem restoration through food web studies.

The biomass production and the accumulation of carbon and nitrogen in soil at all mangrove planted areas increased. The 17 fish samples were collected from Pak Phanang bay and analyzed stable isotope (<sup>13</sup>C and <sup>15</sup>N) for each sample. *Anodontostoma chacunda* (Ray-finned fish) and *Acanthosquilla multifasciate* (Mantis shrimp) were higher TOL (Trophic of level) in this study. This two fishes were supposed that TOL is 23-24 steps from *Rhizophora mucronata*. We need to study for more details on carbon accumulation and food web in mangrove ecosystems.