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AN AGENT BASED MODEL TO INVESTIGATE DRIVERS OF LAND USE CHANGE IN DAM DOI DISTRICT, MEKONG DELTA.

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In the past 40 years, shrimp farming in the Mekong Delta has brought economic development but at the same time also changed the landscape, modified natural resources use and livelihoods and altered ecosystems services related to the mangrove forests. Farmer's decision-making regarding land use is a complex iterative process which is driven by factors that are internal to the farm as well as driven by external factors related to the local environment, the market or the policy frameworks. Understanding this decision making process and linking those decisions to a spatial unit in the coastal zone can help to understand how land use will change and how to promote more resilient production systems and ecosystems in the coastal zone. Based on a literature review and consultations of national and international experts and local farmers, we designed an Agent Based Model that simulates shrimp farmer's land use decisions.

The model includes a decision function based on farm economy, virus outbreaks frequency, bio-physical factors and also the influence of neighboring farms (see Figure 1). We build the model in GAMA-V1.5 (IRD-UNMISCO). The model is tested in Dam Doi district of Ca Mau province in Vietnam where different shrimp farming types are found, from intensive shrimp farms to integrated mangrove-shrimp farms. This model is then used as a participatory tool to discuss drivers of land use change with farmers and local authorities. This type of approach helps to understand and visualize the spatial interactions between bio-physical, on-farm and regional socio-economic factors, thus providing insights in (potential) policies and regulatory frameworks that promote more resilient shrimp aquaculture.

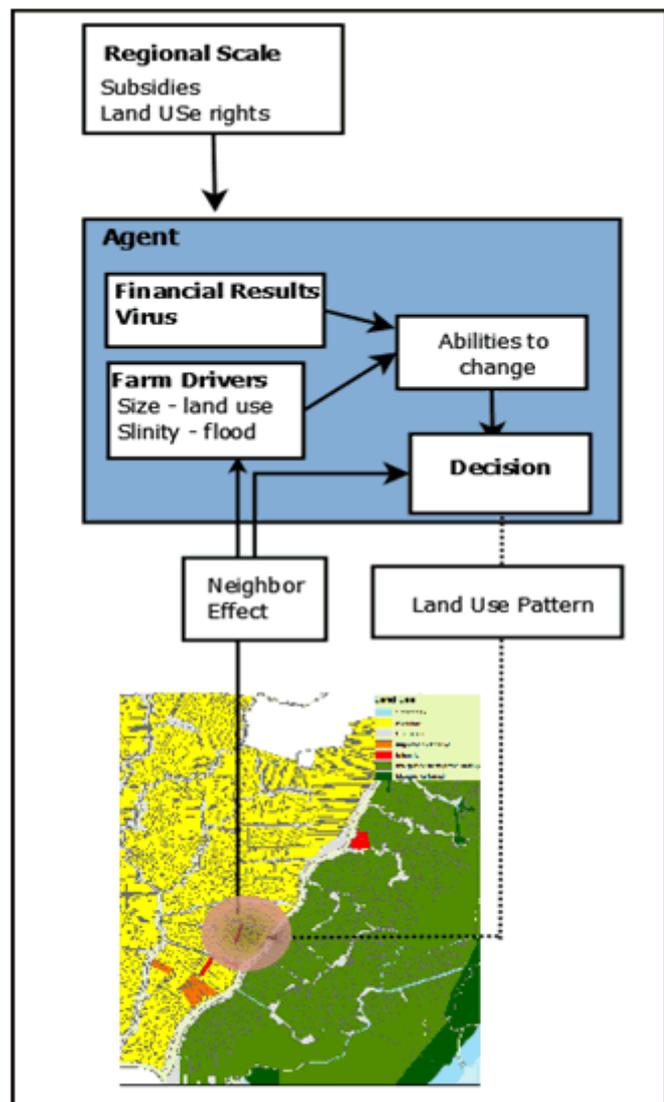


Figure 1: Interaction between farmer (agent), external drivers and neighbors for land use decision