

Welfare Measure of Optimum Coastal Land Use

A Case Study of Krabi Province, Thailand

Background and Problems

For more than 40 years, Thailand has been developed under the national economic and social development plans. The first (1961-1966) and the second (1967-1971) of the plans focused on a single economic growth objective which was continued in the third plan (1972-1976). The fourth plan (1977-1981) marked the beginning of the multiple objective plan which incorporated the objective of utilization and management of main natural resources. However, the plan objectives were not completely implemented because of an enormous change in national politics and the effect of world oil crisis. The fifth (1982-1986) and sixth (1987-1991) of the plans were, therefore, concerned with the stability of economic growth and the alleviation of rural poverty in order to solve the accumulated problems. Local communities were encouraged to improve the status of natural resource and environment in plan six. In plan seven (1992-1996), the sustainable development concept was included under three main interrelated goals which were economic growth, income distribution, and human and environmental development. However, the consequences of the plan implementation come up with the conclusion that the development was not sustainable although there was a satisfactory level of economic growth.

An inevitable change of the plan started in plan eight (1997-2001). This plan focused on social demographic and local community participation objectives as the main development issues rather than economic growth per se. Unfortunately, the plan coincided with the economic crisis in Southeast Asia in 1997. Thailand's economy was also affected. The plan, therefore, was mainly adjusted to cope with this crisis. Some human development parameters, life expectancy, literacy rate, and birth and death rate for example, have improved and the economic crisis has decreased as a result of this plan. Nevertheless, many crucial environmental problems remain such as vast area of agricultural degraded soil, increasing scarcity of water, deteriorated forest and mangrove area, higher loads of pollutions and wastes. Thus, these problems should be solved in the next plan. One of many main issues, which will be implemented in plan nine (2002-2006), is on the classification of coastal land use zone (NESDB, 2001a; and NESDB, 2001b).

To serve the national plan and policy making, this study concentrates on the theoretical and methodological problems of welfare measure of optimum coastal land use, which is applied in Krabi province, Thailand, as a case study. As experiences in many coastal provinces both on the Gulf of Thailand and the Andaman Sea, the conflicts among land use activities on the coast have been tremendous. Agriculture, aquaculture, and mangrove utilization versus conservation are always the key economic activities on Thailand's coastal land use. In addition, the protected area for tourism might become a hot issue to be concerned especially for Krabi's coast. It is newly opened for shrimp farming, commercial tourism and ecotourism since coastal lands in other provinces have been degraded with over use and improper management on the resource utilization.

Externalities, in theory, are the sources of the conflicts among land use activities. They are not internalized into the cost of each entrepreneur. Shrimp farming on the coastal area is the classical case which is usually raised as an example of conflicts to rice field as a result of brackish water dispersion and mangrove encroachment and so on. However, shrimp farming, the main species is the giant tiger shrimp (*Penaeus monodon*), is one of the highest valued aquaculture product in Asia and Thailand. It contributed about 3,766 million US\$ or 9 percent of the total value of the region's aquaculture output in 1997.

Thailand's share to this output was more than half of the market value of this figure. In 2000, Thailand exported about 65 percent of the products to the United State of America and Japan. The area devoted to shrimp culture was almost 80,000 ha which produced 3 billion tons of shrimp; there were 30,000 farms involved. Undoubtedly, after the economic crisis, shrimp product is expected to be an important source of national income from export.

Not only the conflict of coastal land use is needed to be concerned but also the problem of land scarcity, in terms of quantity and quality, which must be a trade-off issue for policy maker. The economist task in this sense is how to apply economic theories and tools in representing some options on optimum land use to policy makers. This study will put the physical, biological, economic, and environmental constraints, as well as the impacts of government policies in the optimization model. The externalities are internalized to society. Linear programming will be used as a key research tool to arrive at the optimal allocation of land resource. The alternative optimum land use solutions provide the information for policy making of proper regulations.

Objectives

The main objective of this study is to construct a theoretical model and framework of welfare measure of optimum coastal land use, which can be applied in general cases. And the specific objectives of the application of the theory and framework are in the following:

1. to investigate the situation of existing land use and related policy. Problems or potential problems and consequences on land use will be identified,
2. to evaluate the economic values and external benefit and cost of coastal land use activities. These values will then be internalized into the land use cost and benefit,
3. to analyze the social cost and benefit of each land use activity, and
4. to search for the optimum land use options as guidelines for decision-makers in coastal land use planning.