



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

Study on Hainan Provincial Environmental and Resource CGE Model

YAN LIU¹, JIANCHUN GUO¹, YOU PING KE²

¹*South China University of Tropical Agriculture, Economics and Management College, China*

²*Chinese Academy of Tropical Agriculture, Rubber Research Institution, China*

Abstract

The lack of natural resource and the degradation of ecological environment caused by the rapid global economic growth after 1960's, are a major challenge to human beings. There is a realization now that social development should be based on sustainable use of natural resources. This paper discusses how to build an 'Environmental and Resource Computable General Equilibrium' (ERCGE) model with CGE theory and establish a 'Hainan provincial Environmental and Resource Social Accounting Matrix (ERSAM)'. Further, it simulates and quantitatively analyses economy-wide impacts of several presumed environmental policies on Hainan.

The paper is divided into three main parts:

The first part, presents the integration of environment and natural resources into the CGE model, and forms the basic structure and equations of the ERCGE model. Based on Chinese economic CGE model and Hainan provincial CGE model built before, it extends and develops an ERCGE model that includes natural resources and environment. The primary approach is to incorporate natural resources as production factors and environmental cost as production cost into this model.

The second part focuses on the establishment of a Hainan provincial ERSAM and parameter calibration of the ERCGE model. The paper estimates Hainan natural resource value and environmental control cost using Hainan provincial data and methods of accounting environment and natural resource values. It then 'integrates natural resource value' as a contributing factor and 'environmental cost' as a separate account into ERSAM. Finally, it calibrates ERCGE parameters on the basis of ERSAM.

The third part describes environmental policy simulation. It analyses potential impacts and effects of changes of natural resource price and environmental cost, on Hainan macroeconomy, productive sectors, usage of natural resources and environmental protection. This provides scientific reference for environment and natural resource decision-making, and benefits sustainable economic development in Hainan.

Keywords: ERCGE Model, ERSAM, accounting environment, resource value, Hainan, policy simulation