Land use scenarios for Viet Nam: From Global to Local

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ABSTRACT

After accession to the WTO in 2007, Viet Nam's economy has become increasingly integrated with the world economy. Global integration has contributed to rapid economic growth (estimated at 6.7% in 2010), resulting in accelerated demand for food, feed, fibre and fuel and competing demands for land and water resources. Viet Nam is also one of the most severely affected countries in the world affected by climate change. The aim of this paper is to analyse future land use patterns in Vietnam under various scenario assumptions. The results of this exercise can be used as input for policies concerning climate change, REDD, land use and climate smart agriculture.

Following the approach of the EURURALIS project, an innovate combination of a Computable General Equilibrium model and a land use simulation model are used. MAGNET, developed by LEI Wageningen UR and based on the Global Trade Analysis Project (GTAP), is applied to analyse the impact of global economic development and climate change on economic growth in Viet Nam. The land use, forestry and yield data in MAGNET, originally compiled by GTAP, are refined for Viet Nam using data from the Vietnamese government and research institutes and similar studies carried out in Viet Nam (e.g. by IFPRI).

For the analysis of future land use, the CLUE (Conversion of Land Use change and its Effects) model, developed by the Institute of Environmental Studies and Wageningen University, is used. CLUE quantifies land use changes by defining the bio-geophysical and human drivers of agricultural land use. Land use scenario information and detailed maps of factors (e.g. soil, slope and rainfall) determining land-use potentials for Viet Nam are used for predicting future land use. CLUE takes information on the demand for land for the different agricultural sectors at the national level from MAGNET as input, and allocates this over the land area according to location suitability, spatial policies and rules for natural succession.

Two scenarios will be quantified. First, a 'business as usual' (BaU) scenario is modelled that reflects common expectations on how the (global) economy will develop. The simulation results will reveal what this BaU scenario implies for the economy of Viet Nam in terms of production, consumption and food security, factor markets, trade, and land use at the national and local level. Subsequently, an environmental protection (EP) scenario which aims to protect forest land in Viet Nam is analysed. The results of this scenario will reveal the consequences of an alternative economic growth path for Viet Nam, with due attention for the environment, and should be contrasted with the results of the baseline. Both scenarios are run over the period 2007-2030. The dynamics are governed by GDP and population projections from USDA (ERS) and assumptions for yield development.

Keywords: Land use; Land use modelling; CGE modelling; Viet Nam, Scenario analysis.