

Economic Development, Paddy Field Loss and Rice Output in China

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This paper investigates factors affecting rice output in China in the past ten years. Particular interests are paid to changes in land uses for rice at the provincial level in relation to paddy field losses due to economic development in the period, with a combination of GIS information and econometric estimation approach.

Rice production is particular as the rice cultivated area is almost overlapped with the area where economy grows more rapidly. It is also true that rice is the major commodity in Chinese diet structure and the main cereal produced (more than 42% of total cereal output in 2005). Therefore, it is of interest of the national food security.

Rice is mainly planted in the Southern China where rainfall and temperature suit for rice production with scattered distribution in some north regions. The rapid economic development, accompanied by fast industrialization, urbanization, road and village constructions have resulted in significant loss of agricultural land and considerable impact in rice production. According to the Chinese statistics, from 1996 to 2004, cultivated land, total cereal sown area and rice sown area reduced by 7.59, 14.77 and 3.83 millions ha, respectively. Although partly offset by technical progress, in the period, total rice outputs fell by 21.48 millions tons in the same period. China is changing from a net rice exporter to a net importer.

Data of 31 provinces (Hong Kong, Macao and Taiwan excluded) are used in this study. The study consists of three model blocks. First block is total land block. GIS information will be used to describing changes in total agricultural land and its structure. A model of non-agricultural uses of the agricultural land which is subject to factors such as GDP per capita, population, urbanization, investment, farmer income and other variables, and a model of conversion of different land types subject to agricultural returns, typological, temperature and water restraints are constructed. The second block is on land distribution among crops. Rice share in the total cereal sown area is assumed to be related to relative prices, total agricultural land area, rural non-farming employment, and other factors such as regional disparities. The third block is yield model to mainly capture technical progress in the Chinese rice production. In the analysis, three different yield level scenarios (the average of the past 25 years, the 1980-95 average and the 1996-2005 average) will be used.

Two results will be produced from the model. First, the impact of main factors affecting Chinese rice production will be identified via a decomposing approach. Second, a projection of rice production in China at both national and provincial levels by 2020 will be provided with scenario assumptions for GDP per capita, population growth and other factors as that for rice yield will be used. The national level output will be compared with trends in rice consumption in China.