

5 Conservation reconsidered: a modified input-output analysis of the economic impact of China's land conservation policy

Fan Zhang
Harvard University, Cambridge, USA

Abstract

To estimate the economic impact of China's land conversion policy, I present a modified input-output model, applying supply constraints to the cropping sector to reflect exogenous restrictions on land availability. Strong biophysical linkages are integrated into the model to capture heterogeneities of climate, soil and terrain conditions relevant to agricultural production. Empirical study demonstrates that this long-term land-retiring programme has evident negative impacts on the rural economy. In Western China, the net present value of total social cost is USD 487 per hectare per year or a capital equivalent of land rent of USD 1,508 per hectare over 10 years, with 5% discounting.

5.1 Introduction

China's forestry and grassland sectors have been undergoing dramatic changes. The 1998 Yangtze River flooding and recurring droughts in the Yellow River basin have heightened public awareness of the severity of Western China's ecological degradation and its potential environmental and economic consequences. In response to nation-wide concerns over trends of ecological deterioration, the central government took the initiative in 1999 to implement a national land conversion programme called

‘Grain for Green’ (GFG), which requires the conversion of steep cropland to forest and grasslands over the period up to 2010 to rehabilitate the country’s key ecosystem services.

Landowners holding agricultural land with slopes exceeding 15 degrees are required to enrol in the ‘Grain for Green’ programme by signing a contract indicating the amount of land to be included. Once enrolled in the programme, landowners must agree to implement a conservation plan that provides forest or grassland cover on the land for ten years. Grazing or harvesting of forage or any other commercial activity is strictly prohibited for the duration of the contract. In exchange, farmers are entitled to receive free seeds and saplings, 50% of the one-time cost of establishing the vegetative cover, annual rental payments for ten years and long-term technical assistance. So far, more than 20 provinces, 400 counties, 5700 townships, 2.7 thousand villages, 4.1 million households and 16 million farmers have become involved, and close to 10% of China’s cropland has been idled under the requirements of the programme¹.

The potential benefits of this ecological programme are significant and broad-based. The conversion of steep cropland to forest or grassland can reduce soil erosion, promote improvements to off-site water quality, provide wildlife habitats and reduce atmospheric CO₂ concentrations. This programme is also justified by its obvious political attractiveness and favourable tax incentives. From the farmers’ point of view, since governmental rental payments for converted land generally exceed agricultural returns from this marginal land², these land conversion payments apparently provide greater income support to farmers than those under existing-farm subsidising programmes³. At the same time, policy-makers call this programme a ‘no-loss’ option that provides valuable economic benefits because it results in reduced agricultural output and a higher market price, narrowing the gap between the support price and the price consumers pay, and thus reducing the cost of the existing farm subsidising programmes.

¹ Chinese State Council Act No. 367

² Lands with slopes greater than 15 degrees (where soils are susceptible to erosion or past erosion damage) are regarded as marginal land and are targets for retiring in this land conversion programme. Hereafter, marginal land refers to the land eligible to be enrolled in the land conversion programme.

³ In China, the Government is the sole seller of crops in the market.. Government purchases the crops from farmers, and then sells them to consumers. Government subsidises farmers by setting the purchasing price of crops higher than the market price.