

From agricultural diversification to specialization: its impacts on economic efficiency in small farming systems in northwest China

Abstract

Agricultural diversification has been a policy objective for most developing countries to transfer their agriculture from traditional grain-dominated production into a sector that is more responsive to markets with a diversity of farm products to meet the increasing demand for food variety and quantity. At the farm level, agricultural transformation is characterised by the shift of production from subsistence to more specialized and market-oriented systems. This process is associated with productivity improvement and greater commercialization, leading to increased income and poverty alleviation.

However, such demand-led and income-maximizing strategies come with trade-offs. At the macro level, diversifying production out traditional staple grains poses a challenge of maintaining national food security and ensuring short-run price stability for basic food commodities in urban markets. At the farm level, specialised farms are exposed to higher risks due to the imperfect input, output, and credit markets and the limited ability to cope with environmental fluctuations, because those farms are relatively larger-scaled and more dependent on purchased inputs and credit.

Over the past three decades, Chinese central and local governments have aimed agricultural policy reforms towards encouraging agricultural specialisation and expansion of farm size. However, whether specialisation is favourable for Chinese small scale farmers is open to debate. Moreover, the question of whether the trend toward greater specialization means greater efficiency gains in Chinese context requires answering.

To answer the above questions, this study firstly investigates how the farm level specialisation is associated to income per capita and other socio-economic factors. Secondly, it examines the impact of specialisation on farm efficiencies. A quadratic relationship between income per capita and specialisation was tested and an interdependent relationship between specialisation and farmers' participation in output markets was estimated. 315

farms' technical, allocative, and scale efficiencies and their relationship between farm specialisation were also examined.

We found income per capita has a U-shaped relationship to livestock specialisation and an inverted U-shaped relationship to crop specialisation. This suggests that smallholders' crop and livestock production specialise at different income levels, higher income level farms are favored to concentrate on livestock production to catch more profit, while farmers are less restricted to starting crop specialisation. Second, we found an interdependent relationship between commercialisation and specialisation within the sample farms. Specialised farms tend to have higher level of market participation, at the same time, participating in output markets encourages farms to specialise their production to a higher degree. The virtuous cycle between commercialization and specialization found in this study confirms market-led specialization directing enterprise towards better market demand and higher potential for income.

Moreover, efficiency analyses show that economic losses are commonly generated by allocative and scale inefficiency. Specialisation increases households' technical efficiency and cost efficiency. This finding stresses farm specialisation leading to efficiency gains for the sample small farms. Policy on specialisation, plot consolidation and size enlargement can result in the expansion of production for northwest small scale Chinese farms.