

Sustainable Agriculture, Food Security, and Socio-Economic Risks in Ukraine

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Abstract In Ukraine, the growth of intensive agricultural enterprises that focus on fast profits contribute considerably to food insecurity and increasing socio-economic and environmental risks. Ukraine has important natural and labor resources for effective rural development; more than 50% of food production is still contributed by small and medium farms, despite the difficulties associated with economic instabilities and the lack of proper policy support. Currently, the main issue for the agro-policy is to use these resources in a sustainable way, enforcing robust long term development of rural communities and agriculture. In this chapter, we introduce a stochastic, geographically explicit model for designing forward-looking policies regarding robust resources allocation and composition of agricultural production, in order to enhance food security and rural development. In particular, we investigate the role of investments into rural facilities to stabilize and enhance the performance of the agrofood sector in view of uncertainties and incomplete information. The security goals are introduced in the form of multidimensional risk indicators.

1 Introduction

In Ukraine, production intensification with a focus on fast profits is one of the main drivers that restructure food markets and distribute resource management rights in an imbalanced way. Intensification is advantageous for large producers, while small

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and medium agricultural businesses abandon the market due to an inability to compete for scarce and costly resources without a proper policy support. As a result, a lack of producers diversification increases risks associated with food and water security, environmental pollution, loss of food diversity, deterioration of socio-economic conditions in rural areas, rural-urban migration, and loss of cultural heritage.

Investigating the dilemma between the economic growth and the degradation of rural areas in Ukraine requires the development of integrated approaches specifying interdependent socio-economic, demographic and environmental criteria of long-term sustainable rural community development. A set of such criteria has already been identified and implemented in the USA, as well as in the EU, see e.g., the LEADER I, LEADER II, LEADER+ programs ([Agriholdings in Ukraine 2008](#); [Leader European Observatory 2010](#)). In Ukraine, similarly to the LEADER programs, rural development planning includes goals of stimulating investments into improving quality of life and social conditions; protection and friendly use of environmental and cultural values; introduction, utilization, and expansion of new technologies and markets of local producers and services.

The aim of this chapter is, first, to analyze implications of recent agricultural reforms and trade liberalization on agriculture and rural areas development in Ukraine. Secondly, according to this analysis, develop a decision theoretic framework for designing forward looking national and subnational agricultural policies. The focus is to support policy choice regarding optimal agricultural production structure with a specific concern to revive and consolidate small and medium scale producers and services in rural areas.

There exist different approaches to the analyses of optimal production structure and resources allocation in agriculture. Studies involving trade liberalization often rely on the concept of general equilibrium (GE). While GE models may provide useful information on several economic aspects of policy reforms, it may be inappropriate, and in some cases misleading, to rely extensively only on their use for planning sustainable development strategies ([Scrieciu 2006](#)). There exists vast literature summarizing the limitations of the GE analysis ([Cramon-Taubadel von et al. 2010](#); [Scrieciu 2006](#)). Two main concerns dominate the discussion. The first is that GEs are too aggregate to include appropriate sustainability indicators with safety/security constraints and horizons of planning. The second raises the issue about “demand-price-supply” relations which are often largely driven by inherent uncertainties and current policies ([Ermolieva et al. 2010](#)), e.g., weather conditions or export-import quotas, and thus can differ from ideal “demand-price-supply” dependencies. The main risk of using the advice from ideal and aggregate GE models without accounting for possible alternative paths is that this may cause various unexpected economic and production shocks such as bankruptcy, non-payments, prices increase, noncompliance to market agreements, etc.

The main task of planning sustainable agriculture in Ukraine is to design necessary resources allocation and regulations for rehabilitation of rural areas ([Borodina 2009, 2007](#); [Christev et al. 2005](#); [Libanova 2006](#); [Pantyley 2009](#); [Prokopa and Popova 2008](#)). Therefore, in this chapter, we introduce an optimization model