Chapter 7
Food Security Through Rational Land Management: Innovative Aspects and Practices

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ABSTRACT

Food security is challenged by the growth of the world population, intensification of agricultural production, depletion of scarce agricultural and environmental resources, and the consequent introduction of innovations to farming processes, one of which is land management. In this chapter, the authors discuss the role of innovative aspects and practices of land management in the establishment of food security and the provision of rational, sound, and effective administration of scarce land resources. In the case of Russia and other countries, the authors justify the necessity of rational land management focused on the innovative way of development of agricultural production.

INTRODUCTION

At the current stage of development of agricultural sector, food security is challenged by the intensification of agricultural production (Erokhin, 2017a) and introduction of innovations to farming processes (Lambin & Meyfroidt, 2011; Gomez & Ricketts, 2013), one of which is land management (Rogatnev, 2001). Recovery of agricultural sector is impossible without transition to innovative development which is the main factor of increase of effectiveness in the market economy environment (Smith, 2013; Smith

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et al., 2010). In any country, the main issues of policy are related to the improvement of management system of social and economic development (Tilman, Balzer, Hill, & Befort, 2011).

According to Van der Molen (2017), growth of agricultural production and productivity are the measures to provide food security for the population of the world in the next decades. Land management and land administration should contribute to efficient land use and security of tenure. However, much agricultural land is not well managed and unrecorded, obstructing realizing the potential for growth (McConnell & Vina, 2018). About 38% of the Earth's land area is being used in agricultural production, with about 31% of the remaining land being under forest cover and the other half being less suitable for agricultural production due to edaphic, topographic and/or climatic factors (Keenan et al., 2015).

Land-use change is arguably the most significant driver of environmental change as it leads to many of the main areas of concern: loss of biodiversity, greenhouse gas emissions, soil degradation, and alteration of hydrological cycles. Land-use change is occurring worldwide due to human development dynamics (McConnell & Vina, 2018). It ranges from whole-scale changes in land cover to changes in the intensity of cropping on a given site, as well as changes in the type of cropping, or from crop production to conservation (Silva et al., 2017). The nature of changes in the farming technologies and practices employed can differ substantially in their effects on carbon storage, biodiversity, and hydrology (Martinelli, Batistella, Silva, & Moran, 2017). Recognizing that the issues of food (in)security are of local relevance, driven by both local, regional and global forces, that changes in land use are local in character but some of the driving forces are regional or global in nature, that food systems are influenced by land use types and changes thereof and that some actions taken to ensure/improve food security influence land use and changes thereof (Molotoks, Kuhnert, Dawson, & Smith, 2017; Chan et al., 2017; Nolasco, Soler, Freitas, Lahsen, & Ometto, 2017; Yawson et al., 2017).

Both state and society pose systematic, sensible, and purposeful influence on land relations. Land management includes the entire majority of innovative relations, i.e. social, economic, legal, and environmental, among others (Creamer et al., 2010). In order to provide sound and efficient usage of scarce land resources to improve food security in various parts of the world, this influence should be based on the cognition of objective laws (Rounsevell et al., 2010). Rational use of agricultural land is the most efficient way to increase the volume of agricultural output, intensify production with minimum harmful effects to the environment, and in such a way increase food security of population and sustainability of agricultural development (Erokhin, 2017b, 2017c; Gao, Ivolga, & Erokhin, 2018). There should be taken into account certain natural, economic, social, and political conditions in accordance with objective patterns of society and nature interaction (World Bank, 2008).

Proper and sound land management includes the following aspects:

- natural aspects that relate to the study of land operation as a component of ecosystem and environment for plants and living organisms
- social and economic aspects that reflect the effect of social processes, state policy, and social relations on land use. They all create economic aspect of using land as a resource
- technological aspects which are connected with studying technical influence on land, technology of land use, relation of sustainable land management, and technological advances
- legal aspects which are related to the study of the value of government legal affairs in organization and implementation of rational land use and protection