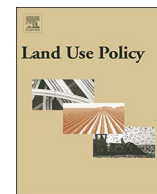




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## Land fragmentation and production diversification: A case study from rural Albania<sup>☆</sup>

Pavel Ciaian<sup>a,\*</sup>, Fatmir Guri<sup>b</sup>, Miroslava Rajcaniova<sup>c,d</sup>, Dusan Drabik<sup>e</sup>, Sergio Gomez y Paloma<sup>a</sup>

<sup>a</sup> Joint Research Centre, European Commission, Spain

<sup>b</sup> Faculty of Economics and Agribusiness, Agricultural University of Tirana, Albania

<sup>c</sup> Faculty of Economics and Management, Slovak Agricultural University, Slovakia

<sup>d</sup> Faculty of Economics, University of West Bohemia, Czech Republic

<sup>e</sup> Agricultural Economics and Rural Policy Group, Wageningen University, The Netherlands

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### ABSTRACT

We analyze the impact of land fragmentation on production diversification in rural Albania. Albania represents a particularly interesting case for studying land fragmentation as the fragmentation is a direct outcome of land reforms. The results indicate that land fragmentation is an important driver of production diversification of farm households in Albania. We find that land fragmentation stimulates significantly more diversification for subsistence farm households than for market-oriented households. Our findings have two key policy implications: (i) the consolidation policies that relocate and enlarge plots would have a significant impact on reducing agricultural production diversification; and (ii) land fragmentation contributes to the nutritional security improvement by increasing the variety of foodstuffs produced by subsistence farm households.

### 1. Introduction

Many countries in Central and Eastern Europe (CEE) and the Commonwealth of Independent States (CIS) have implemented massive land reforms over the past decades<sup>1</sup> as part of the transition process from the centralized system to a market-driven economy. The reforms aimed, with varying degree, at transferring property rights from the state and collective ownership to private individuals. Fragmentation of land use, ownership, or both was an unintended effect of this reform process in several countries.

Albania implemented a radical land reform which led to one of the most fragmented land structures among CIS and CEE countries (Civici, 2003a,b). The causes of land fragmentation in Albania date back to the land privatization in 1991. Three main factors shaped farm structures in the country: (i) land distribution per capita, (ii) split of distributed land by its type (e.g., arable land, orchards, irrigation facilities), and (iii) land scarcity relative to the density of rural population. These factors led to both ownership and use fragmentation of land. Due to the rigid functioning of land markets and subsistence farming, land fragmentation still persists (Lusho and Papa, 1998; Cungu and Swinnen, 1999;

Wandel et al., 2011; Deininger et al., 2012; Zhllima and Guri, 2013).

Although farmland fragmentation is mostly understood as a high number of farmed plots or as a high number of plot co-owners, it is a more complex phenomenon. It includes plot size, the shape of individual plots, the distance of plots from farm buildings, and distances between plots (Latruffe and Piet, 2013).

Because the quantification of several dimensions of land fragmentation simultaneously is challenging, most studies measure farmland fragmentation only based on one dimension (e.g., the number of plots or their average size) (e.g., Sichoongwe et al., 2014; Tana et al., 2010). If more than one dimension is considered, this is typically done using land fragmentation indices such as the Simpson or the Januszewski index (e.g., Blarel et al., 1992; Van Hung et al., 2007). However, these indices ignore critical spatial variables such as the shape of parcels as well as non-spatial variables, for example, ownership type and the existence or absence of road access to each land parcel.

Whether or not land fragmentation yields net benefits is not clear a priori because it may generate both positive and negative effects specific to each case considered. For example, more fragmented farmed plots are likely to enhance biodiversity, thus increasing the value the

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\* Corresponding author at: European Commission, Joint Research Center C/Inca Garcilaso, 3, 41092 Seville, Spain.

E-mail address: [pavel.ciaian@ec.europa.eu](mailto:pavel.ciaian@ec.europa.eu) (P. Ciaian).

<sup>1</sup> The exceptions are, for example, Poland and the countries that emerged from former Yugoslavia. We thank an anonymous reviewer for pointing this out.

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society places on the landscape. On the other hand, the longer the distance a farmer needs to travel to reach a plot, the higher his or her direct (e.g., fuel) and opportunity costs (e.g., time spent) are which ultimately may affect farmers' performance and income. For example, the literature on land fragmentation in Central and Eastern Europe (e.g., Thomas, 2006; Sklenicka et al., 2009; Sikor et al., 2009), in general, finds that a high degree of agricultural land fragmentation hampers the emergence of a private commercial farming structure (Van Dijk, 2003) as well as the development of the agricultural sector and rural areas (Hartvigsen, 2014).

One aspect of the agricultural sector performance which land fragmentation may impact is the agricultural production diversification. There is a rich literature on farm diversification in agriculture. Two strands of research on diversification can be distinguished: (i) farm level and (ii) aggregate agricultural sector level (e.g., Bhattacharyya, 2008; Saraswati et al., 2011). Although both literatures seemingly address the same issue, the two strands of analysis are not equivalent. In fact, they may diverge, meaning that farms might be highly specialized in a given country, whereas the degree of diversification of the aggregate agricultural sector in the same country might be high. Pingali and Rosegrant (1995) argue that economic growth and commercialization of the agricultural sector lead to an increase in the diversity of marketed products at the aggregate country level, while they lead to increasing regional and farm level specialization. According to Bhattacharyya (2008) and Saraswati et al. (2011), important drivers of aggregate diversification are, among others, demand-side factors, rural infrastructure, and market institutions.

The main objective of this paper is to analyze the impact of land fragmentation on production diversification in Albania. We derive our econometric estimations from a survey of 1018 farm households in three Albanian regions in 2013. In this paper, we focus on the farm level production diversification. The main factors affecting farm production diversification identified in the literature include risk, crop rotation, cost complementarities, farm size, and production for household self-consumption (White and Irwin, 1972; Pope and Prescott, 1980; Benin et al., 2004; Culas, 2005; Bowman and Zilberman, 2013; Sichoongwe et al., 2014).

Empirical studies mostly focus on the relationship between diversification and farm size, yielding mixed results, however. For example, White and Irwin (1972) found that larger farms have less diversified production; on the other hand, Pope and Prescott (1980), Culas (2005), and Sichoongwe et al. (2014) find the opposite relationship. Weiss and Briglauer (2000) focus on the dynamics and the importance of off-farm employment for product diversification. They find that off-farm income reduces the degree of diversification; they also find that farms operated by older, less educated, part-time farmers show a lower degree of diversification and a stronger reduction in diversification over time. Empirical literature also finds different micro-level variables that affect diversification choices such as farm household characteristics, farm organization, technological changes, geographical location, labor, experience, wealth, and education (Benin et al., 2004; Culas, 2005; Sichoongwe et al., 2014).

Despite a considerable number of studies analyzing determinants of farm production diversification, few empirical studies estimate the relationship between land fragmentation and production diversification (Benin et al., 2004; Sichoongwe et al., 2014). Land fragmentation is often induced by policies (land reforms) and can have important implications for farmers' production choices and overall rural development. The available studies do not focus on policy-induced fragmentation and its impact on diversification. Moreover, the few available studies find mixed evidence. For example, Benin et al. (2004) found a positive impact of land fragmentation on cereal crop diversity in Ethiopia, but Sichoongwe et al. (2014) find a statistically insignificant impact of land fragmentation on the diversification among smallholders in Zambia.

Studies on land fragmentation in Albania analyzed the impact of

fragmentation on the abandonment of cropland cultivation (Sikor et al., 2009) and productivity (Deininger et al., 2012) with mixed evidence and rather insignificant effects. Deininger et al. (2012) find no support for the argument that land fragmentation reduces productivity. The results of Sikor et al. (2009) reveal a rather counterintuitive effect of land fragmentation—villages with more fragmented land holdings tend to have lower abandonment rates in the early transition period, but no effect was observed in the latter period in 1996–2003.

Our paper has significant policy implications for land consolidation policies and rural nutritional security. State-regulated consolidation is often perceived as a key measure to tackle the land fragmentation problem with the expectation of generating productivity gains (Lusho and Papa, 1998). Land consolidation might be justifiable if land structure dispersed in many small plots constraints the functioning of land markets, and if it represents an impediment to productivity and efficiency gains. Although Deininger et al. (2012) do not find support for the argument that fragmentation reduces productivity in Albania, our results suggest that one of the important associations of land fragmentation could be diversification of farm production activities. If this is the case, then land consolidation policies may have indirect consequences for farmer's production structure choices, potentially contributing to the specialization of production into a smaller number of products. On the other hand, land fragmentation may contribute to the provision of a less expensive and more heterogeneous food basket to subsistence farmers, thus contributing to the nutritional security of rural households in Albania.

## 2. Land reform in Albania

Three waves of radical land reforms were implemented in Albania during the last century: (i) land reforms before the World War II, (ii) collectivization, and (iii) the land reform of 1991 (decollectivization). These reforms produced opposing effects on farming systems and land structures. The first reform aimed at redistributing land from big landlords to rural peasants as a means of correcting the huge ownership inequality inherited from the Ottoman Empire (Civici, 2003a,b). However, this reform succeeded only partially in redistributing the land as most of the land remained under the control of big landowners. Following other communist regimes in the region, Albania implemented a large-scale collectivization and nationalization process of land after the World War II. By 1976, most land was either in state or collective ownership, and agricultural production was organized in large farming conglomerates (cooperatives and state farms) with an average size of more than 1,000 ha (Civici, 1997; Guri et al., 2011).

Collectivization of land led to the collapse of the Albanian agricultural sector. There were serious shortages of basic foodstuffs, causing widespread discontent in the general population (Cungu and Swinnen, 1999). Food shortage and inefficiencies associated with the state and collective ownership of assets generated pressure for decollectivization and the introduction of private property after the fall of the communist regime in 1990 (de Waal, 2004). Under these pressures, third radical land reform was implemented in 1991. The reform process pursued the principle of social equity among rural population (Guri et al., 2011). This is in contrast to the reform approach implemented in most other CEE countries which also attempted to correct the historical injustice of expropriation of private properties during the communist regime (Civici, 2003a,b).

The privatization process distributed land in the same quantity and quality to all rural inhabitants. The reform was implemented at the village level where a land distribution committee, elected by villagers, was responsible for carrying out the distribution. The reform distributed more than 700,000 ha of agricultural land, previously controlled by the state and collective farms, to 490,000 families living in the rural areas. The decollectivization process was not applied in the same way in all areas. In northern regions, the expropriated owners received back all their land. In other regions, where the equity rule was

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