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FARMING PRACTICES AND POLICIES IN SHAPING THE ORGANIC AGRICULTURE IN ROMANIA. A SHOWCASE OF SOUTHERN ROMANIA

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ABSTRACT

Following the pre-accession to the European Union (EU), significant changes have taken place in the agricultural policy and practice in Romania, with implications in the productivity and management of the agricultural landscape. After the EU-accession, the implementation of the Common Agricultural Policy (CAP) provided support for both rural development and sustainable agriculture. At the same time, the increasing demand of consumers for high quality products on the one hand, and the need to protect and improve the quality of the environment as a result of organic land management practices, on the other, provided the perfect frame for the development of organic farming. The current study aims at providing an insight into the organic agriculture in Romania, with a special focus on the southern part of Romania (Romanian Plain and Dobrogea Plateau), an area which enjoys favourable natural conditions for this type of sustainable agriculture. The key findings of the paper are the identification of the linkages between EU/national policies and organic farming; building up a large geodatabase and providing spatial and statistical assessments of up-to-date records on organic farming based on data provided by the National Institute of Statistics, the Ministry of Agriculture and Rural Development and the EUROSTAT statistics and reports, as well as by the inspection and certification bodies. Based on the data gathered from the 720 organic operators at LAU 2 level in southern Romania, various indicators (e.g. cultivated area with different crops, organic farms by size class of agricultural area used, number of organic operators) were computed and represented spatially using GIS techniques.

Key words: organic agriculture, farming practices, farming policies, Romania

INTRODUCTION

In its attempt to green the economy, the European Union (EU) has implemented policies to support an alternative farming type, i.e. organic agriculture. This alternative form of agriculture sustains environmental protection, animal welfare, food quality, consumers' health, sustainable use of resources (Stolze and Lampkin, 2009; Moschitza et al., 2015; Stolze et al., 2016) and can be considered the opposite to intensive, industrial farming, as well as an alternative to traditional farming (Constantin, 2012).

The techniques used in organic farming include crop rotation, green manure and compost, strict limits on chemical synthetic pesticide and fertilisers, absolute prohibition of the use of genetically modified organisms, biological pest control etc. (European Commission, 2016). In line with that, in the recent years, EU policymakers have come to recognize the dual role of organic farming, namely the increasing demand of consumers for high quality products on the one hand, and the protection and improvement of water and soil quality as a result of organic land management practices, on the other (Barbu and Bără, 2010; Meredith et al., 2014). At the same time, organic farming is considered one of the leading tools of rural development in the European Union, often designated to provide socio-economic support for small-farms and job creation (Konstantinidis, 2016).

Currently, at EU-28 level, agriculture is the most dominant land use, accounting for almost half of total land area (59.8%) (Farm Structure Survey, 2013), of which the almost 40% represents Utilised Agricultural Area (UAA).

The organic area was 5.9 % of total EU-28 UAA in 2015 and continues to show an

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upward trend (Organic Farming Statistics, 2016) with significant differences in the growth potential of organic production area between the EU Member States. This increase refers to area under organic farming, as well as the number of holdings and overall organic operators registered in the EU-28. Among the member states, Croatia and Bulgaria recorded growths of over 100% between 2010 and 2015. Over the same time span, Romania had recorded rather significant growth (34.6%). In 2015 only, four Member States accounted for more than half of all organically farmed land: Spain (18%), Italy (13%), France (12%) and Germany (10%), together making up 53 % of the total EU-28 organic area (Organic Farming Statistics, 2016).

Over the past twenty years, under the support of the revised CAP, organic farming has grown from a secondary activity to one of the key features of European agriculture (Konstantinidis, 2012). Compared to the support under previous reforms, there are some novelties for organic farming under the CAP 2014-2020 that make it more effective through the „greening component", thus helping to meet EU climate and environment goals and though supporting farming conversion and maintain payments under the new rural development regulations (Stolze et al., 2016).

Overall, in Romania, organic agriculture can successfully contribute to a sustainable development of rural areas, as they provide favourable conditions for large-scale production, especially in mountain regions (Barbu and Băra, 2010), but also in the agricultural-prone areas from southern Romania. Recently, organic farming has been increasingly addressed in different studies dealing with general aspects of organic agriculture in Romania (Ion, 2012; Saracin and Vasile, 2015), policies and strategies (Robu et al., 2009), perception studies (Toma and Mathijs, 2007), consumer behaviour (Petrescu, 2013; Petrescu et al., 2015), impacts on environmental protection (Teodorescu and Alexandrescu, 2012) and sustainable rural development (Sima, 2009; Barbu and Băra, 2010), economic performance of the organic farming system (Subic et al., 2010; Constantin, 2012; Vasile et al., 2015) etc.

METHODS AND DATA

The current study aims at providing an insight on the organic agriculture in Romania, with a special focus on the southern part of Romania. The authors employed large statistical datasets provided by the National Institute of Statistics, the Ministry of Agriculture and Rural Development (2014, 2015, and 2016) and by the EUROSTAT statistics and reports (2013, 2014, and 2015). In addition, an important step was building up a large geodatabase on organic farming for the counties located in the southern part of Romania (Romanian Plain and Dobrogea Plateau), using the records provided by 12 of the inspection and certification bodies approved by the Ministry of Agriculture and Rural Development which provide certification services in Romania (2015) (Table 1).

The authors extracted from the data sheets of the inspection and certification bodies all 720 organic operators (producers, processors, traders) at LAU 2 level in the Romanian Plain and Dobrogea Plateau the surface cultivated with different crops, both under conversion and maintenance, at farm level.

Based on the processed data, various indicators at LAU 2 level (e.g. the area with different organically grown crops; the number/share of organic farms by size and used agricultural area, the number of organic operators) were computed. Also, the indicators were represented on a series of maps using GIS techniques.

Table 1. The analysed inspection and certification bodies which provide certification services in Romania

Certification code	Inspection and certification body	No. of certified operators
RO-ECO-015	AGRECO R .F. GÖDERZ GMBH GERMANIA (Romania branch), www.agrecogmbh.de	203
RO-ECO-009	BIOS S.R.L ITALIA (Romania branch), www.certbios.ro	176
RO-ECO-008	S.C. ECOINSPECT SRL, www.ecoinspect.ro	145
RO-ECO-010	LACÓN PRIVATE INSTITUTE FOR QUALITY ASSURANCE AND CERTIFICATION OF ORGANICALLY PRODUCED FOODSTUFFS SRL, GERMANY (Bucharest branch) www.lacon-institut.com	91
RO-ECO-007	S.C ECOCERT SRL, www.ecocert.com	71
RO-ECO-023	MIŞCAREA ROMÂNĂ PENTRU CALITATE, www.mrco.ro	37
RO-ECO-021	CERTROM SRL, www.certrom.ro	29
RO-ECO-018	AUSTRIA BIO GARANTIE GMBH ENZERSFELD (Bucharest branch), http://ro.abg-cert.com/	13
RO-ECO-022	S.C. ECOROISCERT SRL, www.ecoroiscert.ro	8
RO-ECO-001	BCS ÖKO-GARANTIE ROMÂNIA SRL (Romania's branch of BCS OKO-GARANTIE GmbH Germany), www.bcs-oeko.ro	3
RO-ECO-005	S.C ICEA ROMANIA SRL, www.icearomania.ro	3
RO-ECO-016	BIOAGRICERT ITALIA SRL (Romania branch), www.bioagricert.org	1

GENERAL OVERVIEW OF ORGANIC FARMING IN ROMANIA

In Romania, the legal basis of the organic farming system was established in the 1990s by the Commission Regulation (EC) no. 2092/1991 concerning the organic production of agricultural products and indications for their presentation as agricultural products and foodstuffs. Hence, in 1997, the first association of organic farming was founded, i.e., Bioterra Association (Meredith and Willer, 2014). However, the most important factor supporting organic farming in Romania was the policy framework provided by the accession process to the EU (2000) and the EU accession (2007) by assuming the Common Agricultural Policy (CAP). The financial support for organic farmers was provided through the Rural Development Programs (RDP) 2007- 2013 and 2014-2020. The overall budget for organic farming support in the RDP 2014-2020 is around € 236 million.

Organic farming is an important part of sustainable agriculture in Romania, which although faced an upward trend in recent years, covers only 2% of total agricultural production. The authorities show an increasing concern for the developmental of organic agriculture through several incentives, as well as through training, promoting and organizing the local producers for selling their products on the domestic and foreign markets. Moreover, Romania enjoys favourable natural conditions i.e. soil, climate, for organic farming on about 15% of the farming land.

After 1989, the land reform put emphasis on the extensive character of agriculture through enhanced land fragmentation and lack of investments and endowments rather than providing support to an affective agriculture. In this context, given the low level of inputs in the last 25 years, only some of the conditions that favour the development of organic farming in Romania are met. At the same time, the adoption of the Acquis Communautaire also means the commitment towards adapting agricultural practices to obtain organic products able to comply with the European standards.

The total area under organic farming in 2015 was 245,934 ha, which represents 1.7% of the total agricultural area. The main crop types grown organically are cereals (33%), followed by pastures and hayfields (30.8%) and textiles and oleaginous plants (21.4%).

The total organic area (excluding the surface designated to collecting wild flora) increased continuously until 2013, from 13,400 hectares in 2000 to over 301,000 ha in 2013, followed by a slight decrease, reaching 289,000 ha in 2014 and 246,000 ha in 2015 (Ministry of Agriculture and Rural Development, 2016) (Figure 1).

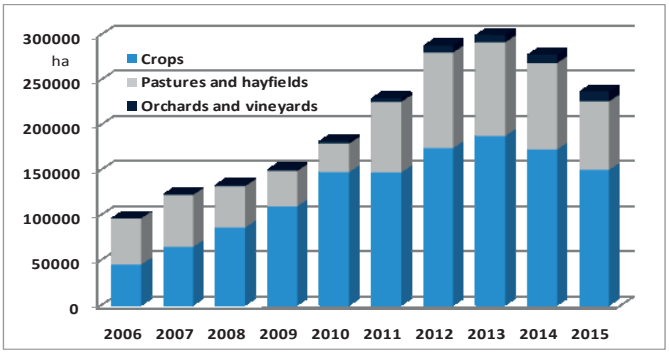

Figure 1. Organically cultivated areas (hectares) between 2003-2015 (Ministry of Agriculture and Rural Development)

A positive trend was recorded in the livestock sector, especially in the number of sheep and goats. In 2012, there were 160,000 of sheep and goats, 85,000 of laying hens, 60,000 of dairy cows and 102,881 of bee families (Ministry of Agriculture and Rural Development, 2014).

Over the 2007-2016 period, the total organic agricultural production has continuously grown together with the diversification of the resulted products such as: processed cattle, pig and sheep products, processed soy products (milk and tofu), various types of bread, pasta, processed rice products, muesli, herbal teas and forest flowers, apple juice, processed snails products, forest fruits juices, organic wine etc.

Generally, the average dimension of organic farms is significantly higher than the average size of a conventional farm, both in the case of field crops and permanent crops (Table 2). This is due to the preeminent commercial nature of organic farms and the certification process to enter the organic farming system. Also, the employment used in organic farming is around 16.7 workers/100 hectares compared to 13.7 workers/100 hectares in conventional agriculture; the high difference being justified by the large use of manual work in organic system and mechanical work in the conventional one (Ion, 2012).

Table 2. The average size of organic/conventional farms

Crop type	Average dimension of farms(ha)/type of agriculture	
	Organic	Conventional
Field crops	72	7
Permanent crops	45	4

Processed after Ion, 2012.

In 2007 only 383 operators were registered in the organic farming system. Their number increased to 12,231 operators in 2015, reaching the highest peak of 15,544 in 2012. This increase is mainly granted by the support measures for the conversion period under Article 68 of *Regulation (EC) no.73/2009 for the establishment of common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers* (Ministry of Agriculture and Rural Development, 2014). After 2012, the decreasing number of operators can be explained by the negative effects of the economic crisis which came into force after 2008, tightening the credit conditions and generally, by increasing the difficulties and risks of starting a new business, particularly for the young entrepreneurs. However, under the current EU regulations and subsidies, an increase in the number of operators or organic surface is to be expected (Figure 3). In Romania, most of operators in organic

farming are located in Alba County (2082), followed by the counties of Suceava (1482) and Bistriţa-Năsăud (1045) (Figure 2).

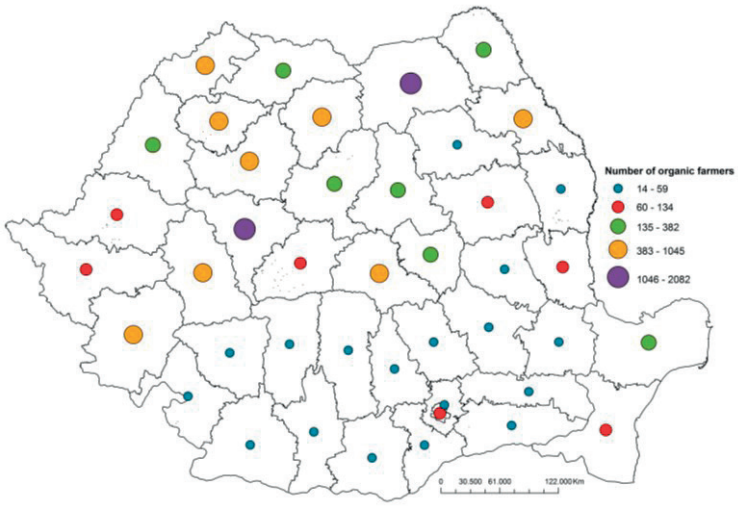

Figure 2. The number of organic farmers in Romania (2015)

The distribution and marketing of organic products to consumers can be done using different ways: local markets specialized in organic products; specialized organic shops in rural or urban areas; along the streets in rural areas; directly from the farm; door delivery, usually based on internet orders; supermarkets (Ion, 2012). An important share of the total quantity of organic products (over 70-80%) is exported to countries like Germany, Italy, Greece, Switzerland, the Netherlands, France etc. The main products exported are: oilseeds, cereals, wild berries and mushrooms, dairy products, honey and derivatives, sunflower oil.

Types of financial support to organic farming. The growing demand for organic products has boosted both the increasing number of operators and surfaces used in organic farming and crop diversification and products. In order to maintain the already certified organic land, but also for their expansion, a series of support measures to farmers is required.

In this regard, one of main objectives of the *Agrifood Sector Development Strategy for Medium and Long Term Horizon 2020-2030* developed by the Ministry of Agriculture and Rural Development with assistance from the World Bank, is to increase the production and export of organic products as a result of the increased demand in the foreign market.

The first support measures for organic agriculture have been included in the 2013-2014 RDP (Measure 214) ever since 2010. They were aimed at maintaining organic farming methods, as well as payments in euro per ha. These payments accounted €162 for crops on arable land (including fodder crops), €335 for vegetables, €270 for medicinal and aromatic plants and €393 for perennials (orchards and vineyards). Permanent grassland falling into the organic farming system has only received financial support during the conversion period.

In the RDP 2014-2020, organic farming is one of the main tools for minimizing water pollution in the sustainable land management systems aimed at controlling the nutrient, managing crop protection, water and erosion. By the organic farming methods provisioned in Article 29 one can support the protection of natural resources with positive effects on soil quality, thus helping control degradation processes.

The support for organic farming (Measure 11) will be so for the conversion to organic farming methods (sub-measure 11.1) and to maintain organic farming practices (sub-measure 11.2). The support for the conversion to organic farming (sub-measure 11.1) shall be for a period of 2 years (for annual crops) or maximum 3 years (perennial crops), and farmers shall commit to maintain organic certification areas for at least 5 years.

Compensation payments shall be granted as a fixed amount per year per/unit area (hectare) for six types of crops: crops on arable land (including fodder plants), vegetables, orchards, vineyards, medicinal and aromatic plants, permanent grassland. The granted amounts will vary between €124/ hectares/year for permanent grasslands and €620/hectares/year for orchards. In order to benefit from this support, in addition to other eligibility requirements, farmers must have a minimum farm area of 1 hectare, while the eligible lots should have at least 0.3 hectares (0.1 ha for vineyards and orchards, shrubs trees, hops, fruit tree and vine nurseries) (Figure 3).

The support for maintaining organic farming practices (sub-measure 11.2) shall be for a period of 5 years, after which it may be extended annually, no more than the implementation period of the RDP 2014-2020. The financial support will be for the same types of crops and will be granted annually per unit area (hectare). The amounts will vary between €111/hectares/year for permanent grassland and €479/hectares/year for vineyards (Figure 3).

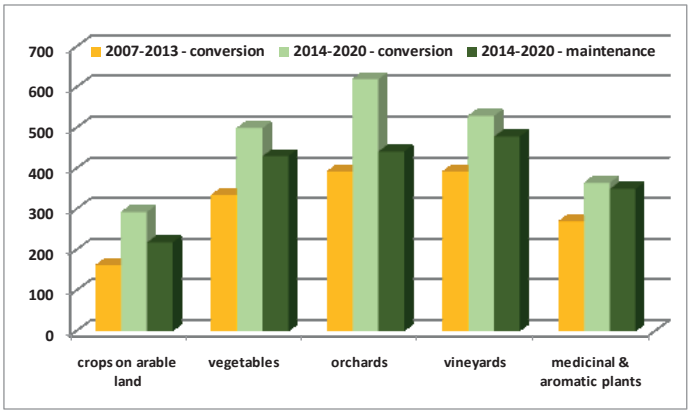

Figure 3. Subsidies for organic agriculture 2007-2013 vs. 2014-2020 (processed after the Ministry of Agriculture and Rural Development)

ORGANIC FARMING IN SOUTHERN ROMANIA. POTENTIAL AND CHALLENGES

The study-area is located in the southern part of Romania, overlapping the Romanian Plain and Dobrogea Plateau. The area has always been an agricultural rural space (mainly arable with over 70%) as a consequence of its favourable geographic, social and historic conditions attributed to the space unfolded between the Carpathian Mountains (in the north and north-west), the Danube River (in the south and east) and the Black Sea (in the east) (Figure 4). These particular environmental features coupled to the political and socio-economic factors, the area has been exposed to over time, had led to major spatial transformations in the structure and functionality of the agricultural land.

The social and economic potential of organic agriculture in southern Romania.

The study area has great natural, but also social and economic potential for agricultural development given by the significant share of rural population (40,3%), large percentage of workforce and employment in agriculture and the great number of rural LAU 2 (1175) compared to urban LAU 2 (112).

Figure 4. Location of the study-area

Within the EU, around 70% of employment in agriculture is concentrated in six countries (Romania, Poland, Italy, France, Spain and Germany), of which Romania and Poland alone account for around 45% of the total. It also represents more than 10% of total employment in five Member States: Romania (31.4%) and Bulgaria (19.4%), followed by Poland, Greece and Portugal. Moreover, in Romania, Slovenia, Bulgaria, Poland, Austria and Greece self-employment in agriculture reaches 85% (EU Agricultural Economics Briefs, 2013). Therewith, in the study-area, the greater part of employment is currently provided in the farming sector. In the counties totally or partially overlapping the limits of the study-area, employment in agriculture represents 1.07 million people (26.8% of total employed population). The highest share of population employed in agriculture is registered in the rural settlements located in south-western and eastern parts of the Romanian Plain, where it represent the main occupancy. The lowest values of employment in agriculture are characteristic for the large towns and some rural localities in the surroundings of big cities (e.g. Bucharest, Galaţi, Brăila, Constanţa), more attractive for industrial or tertiary activities (Figure 5).

According to the last population census (2011), population aged 15-64 years (economically active population/workforce) accounted for 6.94 million people in the counties totally or partially overlapping the limits of the study-area. The share of workforce is 74.5% of total population, higher than the national records (67.8% in 2011). Although the workforce is mostly concentrated in the major towns of Southern Romania, the highest percentage of workforce of total population is recorded in small towns (e.g. Popeşti-Leordeni, Pantelimon, Chitila and Bragadiru) and rural settlements (e.g. Chiajna) located near Bucharest. Also, almost entirely, Ilfov County represents a large labour pool, similar to the South Dobrogea Plateau (Black Sea cost). The highest workforce shares of total population are correlated with high and positive values of natural balance and vitality index (e.g. rural settlements in the vicinity of Galaţi City) or with the positive level of migratory balance (e.g. the area near Bucharest) (Figure 5). This social and economic context might provide a sustainable alternative by practicing organic farming, especially for the rural population leaving in smaller communities or in secluded localities, thus providing farmers with new job opportunities and higher incomes than conventional farming. It has been argued that organic farming can provide rural development benefits through enhanced employment and through closer connections with the local economy (Lobely, 2009). Thus, improving the skills and knowledge of

workers in agriculture through professional reconversion and increasing the level of education, especially among young people, might lead to greater degree of workforce specialisation for sustainable agriculture, and ultimately to higher standards of living for rural population.

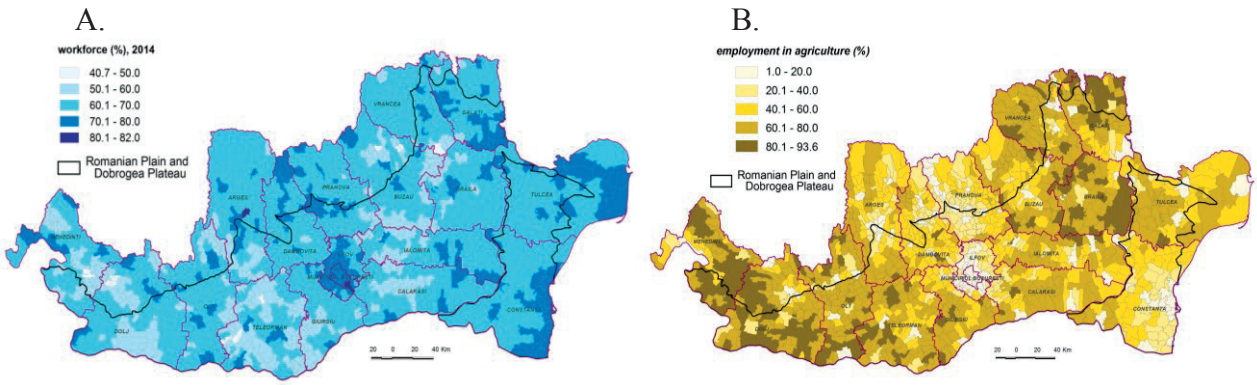

Figure 5. Workforce (A) and employment (B) in agriculture in the southern Romania (2011)

Organic farming in southern Romania. Out of the total cultivated area of the counties located in the Romanian Plain and Dobrogea Plateau, measuring 4,652,941 hectares, only 62,925 hectares are cultivated organically (1.4%), of which 18,163 hectares under conversion to organic farming. To this, 489 hectares of orchards, 485 ha of vineyards and 1,946 hectares of pastures are added. Over 63% of the cultivated area is occupied by cereals, followed by oil plants (24%), vegetables, pasture and other crops, each with a share of 3%, textile plants, vineyards and orchards, accounting for 2% (Figure 6).

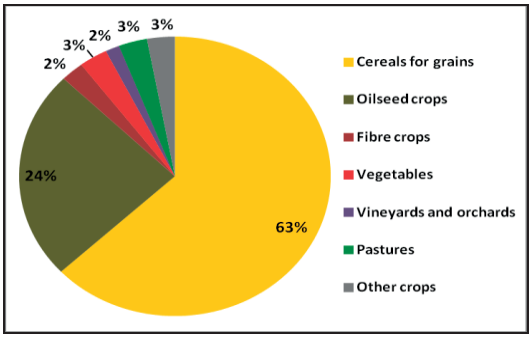

Figure 6. The share of organic cultivated areas by crop type (2015)

In 2014, the counties located in the Romanian Plain and Dobrogea Plateau, 720 operators involved in organic farming were registered, most of them having been registered in Tulcea County (249 operators) with up to 39 operators at LAU2 level. In the rest of the study-area, only 9 localities registered more than 6 organic operators, most of localities having only one organic operator (Figure 7).

Cereal grains are grown on an area of 41,518 hectares, especially in the counties located in Dobrogea Plateau and in the south-eastern and north-eastern parts of Romanian Plain (e.g. Călăraşi, Ialomiţa, Galaţi counties), occupying areas reaching up to 1,294 hectares at LAU2 level. In the rest of study-area, the cereal grains occupy smaller areas (under 130 hectares), except for four municipalities in the county of Teleorman, where cultivated areas varies between 277 hectares in Radoieşti commune and 976 hectares in Necşeşti commune (Figure 8).

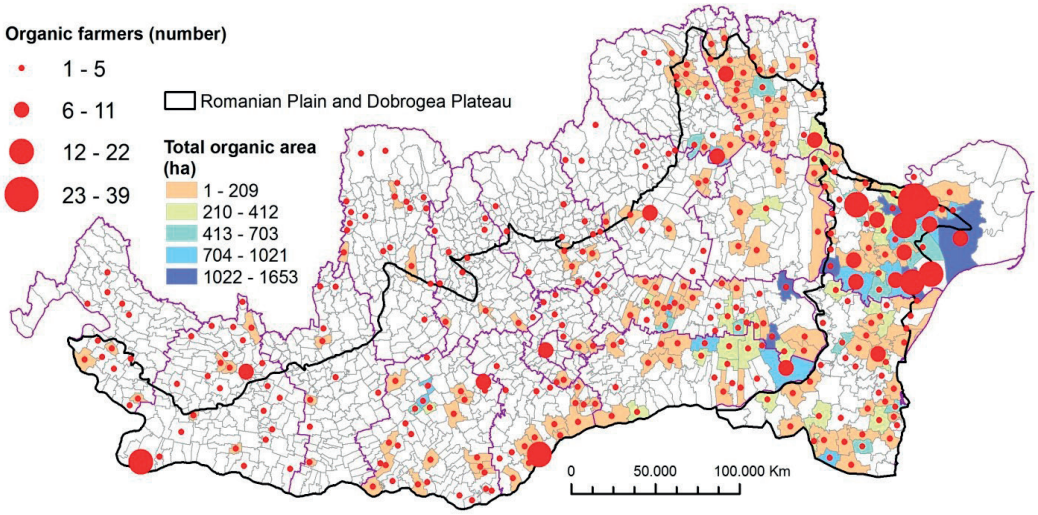

Figure 7. The number of organic farmers and area under organic farming in the southern Romania (2015)

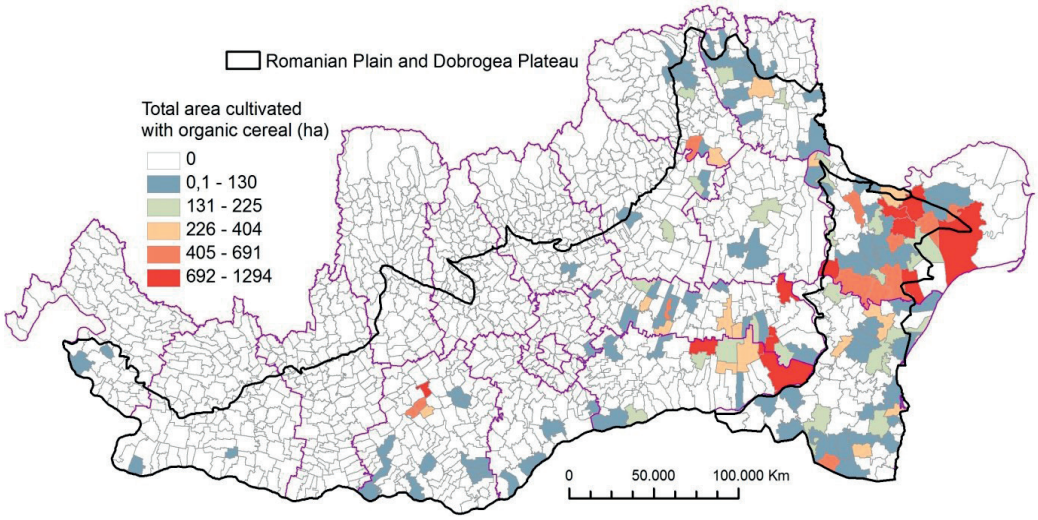

Figure 8. The total area cultivated with organic cereal in the southern Romania (2015)

Within the areas covered with cereals, the largest shares are held by wheat and rye (58%), corn (22%) and barley (16%) (Figure 9).

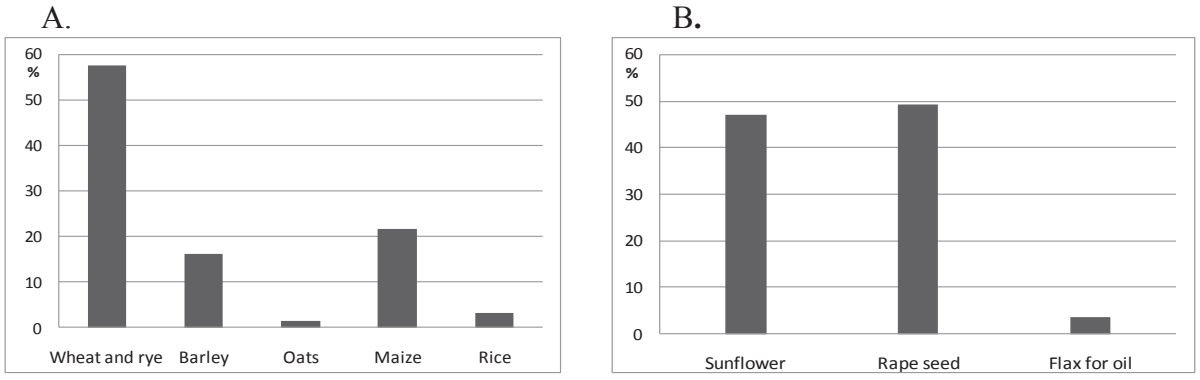

Figure 9. The share of organically grown cereals (A) and oleaginous plant (B) in the southern Romania (2015)

Oleaginous plants are grown on 24% of the organically cultivated area (15,974 hectares), generally covering the same regions as cereals, especially in the counties of Tulcea and Constanţa, where oilseed plants occupy the largest area, 8,798 hectares and 2,127 hectares, respectively. Rape is the most widespread crop, accounting for 49% of the total area with oleaginous plants, followed closely by sunflower with 47% (Figure 10).

The surface cultivated with organic *vegetables* totalise 1,937 hectares (3% of the total organic area), including area planted with peas and soybeans. The area covered with organic vegetables is different from other cultures, being mainly located near large cities, where the demand for organic products is much higher (Figure 11).

In most communes where organic vegetables are grown, areas occupied are small, less than 11 hectares, except for a few communes located in Tulcea, Constanţa and Galaţi counties, where the larger areas are due the peas and soybeans crops. In Romania, the organic beekeeping sector has been a positive evolution and represents an opportunity for beekeepers to increase their incomes (Popovici et al., 2015).

The first certified organic beekeeping producers were recorded in 2000, and in 2013, over 1,200 beekeepers practicing organic apiculture were registered. The total organic honey production was of 3.650 tonnes (2013). In 2014, there were nearly 90.000 organic honey bee colonies (Romanian Beekeepers' Association, 2015).

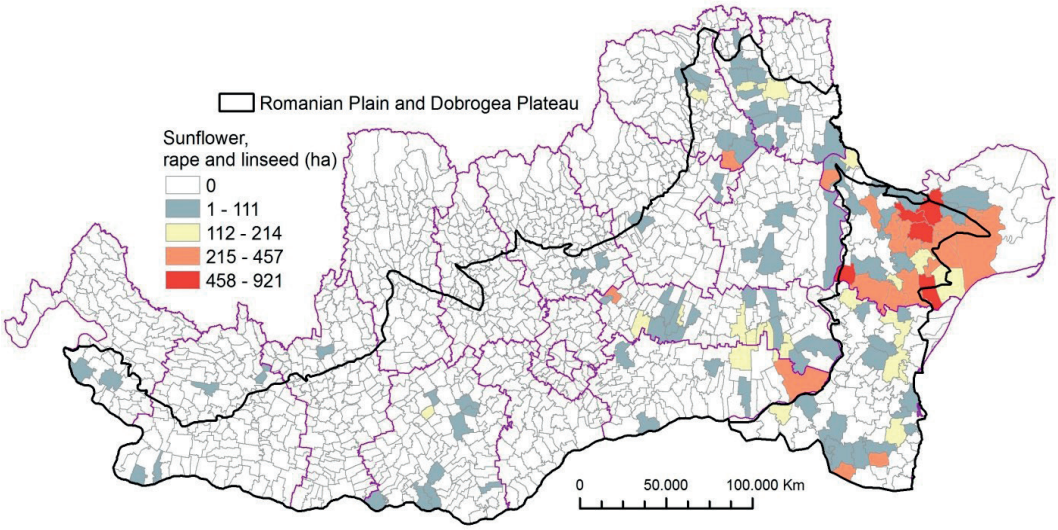

Figure 10. The total area cultivated with sunflower, rape and linseed in the southern Romania (2015)

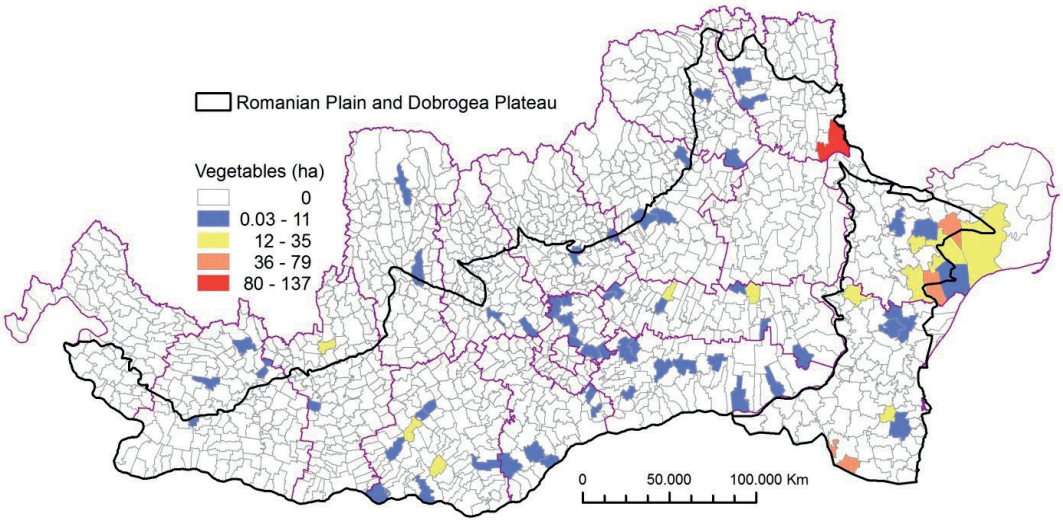

Figure 11. The total area cultivated with organic vegetables in the southern Romania (2015)

In Romanian Plain and Dobrogea Plateau, in 2014, there were 22,831 organic honey bee colonies and 5,351 bee colonies in the conversion period to organic agriculture. The most number of organic beekeepers and bee colonies are found in Tulcea County (9,505 bee families). At LAU2 level, the number of organic bee colonies can reach to 3,054 families in Dobrogea Plateau and are under 200 bee families in Romanian Plain (Figure 12).

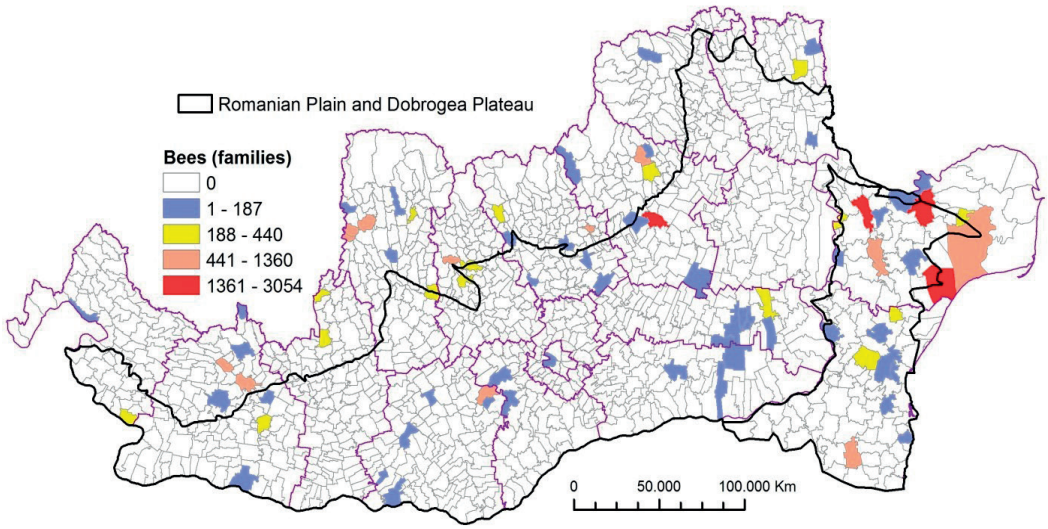

Figure. 12. The spatial distribution of organic bee families in the southern Romania (2015)

The analysis of organic farms in terms of class size highlights the prevalence of 100 hectares farms (37% of all organic farms) in Dobrogea counties followed by the 10-50 hectares (25 %) and 50-100 hectares (17%) categories. In the counties located in the Romanian Plain, the largest share is held by the following size classes: 10-50 hectares (24%), 1-5 hectares (21%) and less than 1 hectare (18%) (Figure 13).

Over 82% of the area under organic farming belongs to large (over 100 hectares) and only 0.1% is used for very small farms (less than 1 hectare).

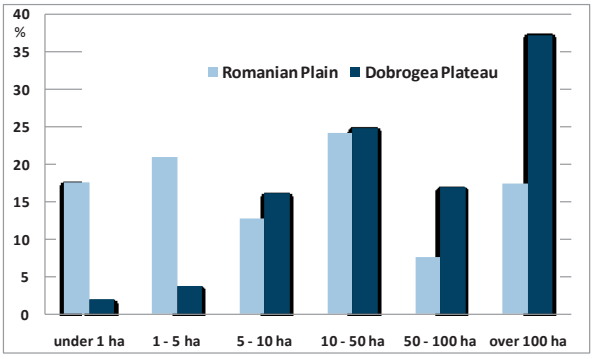

Figure 13. Organic farms by size class of the area under organic farming in the southern Romania (2015)

CONCLUSIONS

Even though it covers a rather small share of the agricultural area, organic farming in Romania is an important component of sustainable agriculture. The availability of EU funds for agriculture and rural development, as well as the financial support for organic farming during the current EU financial exercise (2014-2020) provides support for quality food products and effective farm management, but also for climate change adaptation and mitigation measures and greening – support for environmental protection (Natura 2000 sites).

It has been proven that Romania has the necessary conditions of soil and climate for some 15% of the agricultural area to be ecologically cultivated. In line with that, the main target for the Romanian agriculture in terms of quality is to put the emphasis on organic farming as one of the leading goals of sustainable development, as well as to provide doable economic response to ever greater market demand for ecological products and to provide effectiveness for

land cultivation, environment protection, and livestock welfare. Moreover, there is potential to obtain lower prices for the organic products, thus becoming real opportunity to improve the quality, revitalise and increase the attractiveness in rural areas, as well as providing new job opportunities and higher incomes. Moreover, the potential of creating "green jobs", "green infrastructure" and development of "green skills and knowledge" has been taken into consideration at EU level into several strategic documents (e.g. EC Green Employment Initiative: Tapping into the job creation potential of the green economy) and in the European Regional Policy for 2014-2020. Thus, there is a great concern with promoting low carbon technologies, energy efficiency and green energy, especially in rural areas (e.g. Large Infrastructure Operational Programme) and increasing the employment and improving the skills of young NEET (Not in Employment, Education or Training) aged 16-24 years (e.g. Human Capital Operational Programme). All of these could provide additional opportunities for rural development through the revitalisation of agriculture, providing skills for an organic-oriented farming, enhancing social inclusion and poverty reduction. Organic farming also implies a high degree of raising awareness on the importance of organic farming for the environment (contributing to GHG mitigation, biodiversity conservation), economy (jobs creation and incomes), social (e.g. slowing the rate of rural-urban migration) and cultural (e.g. revitalising/using traditional agricultural practices) development.

The uncertainties associated with organic farming in Romania might involve coping with climate change-related consequences, especially in southern Romania, where missing subsidies and state support for irrigation systems and the high price of water could be a drawback in the expansion of areas under organic farming. As a result, yield risks due to the management schemes which involve restrictions to the use of chemical fertilizers and pesticides could be barriers for conversion.

Another associated risk is related to the price due to the still undeveloped local market for organic products and the high differences of prices between conventional and organic products.

Therewith the continuing demand for urban land and the conversion to other urban land use categories (e.g. residential, commercial) could also represent a limiting factor in expanding areas under organic agricultural management.

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