ANALYSIS OF SUSTAINABLE DEVELOPMENT OF AGRICULTURAL LAND IN THE NORTH-WEST DEVELOPMENT REGION OF ROMANIA

Sergiu-Bogdan Pop*, Nicolae Pop, Teodor Rusu
University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăștur St., 400372, Cluj-Napoca, Romania
**Corresponding author: popsergiu36@gmail.com*

Abstract: The paper presents the situation of agricultural land use in the North-West Development Region of Romania, in order to analyze the sustainability of their use, at the level of 2023. The method of analysis used was that of the questionnaire-based sociological survey, with questions relevant to the indicators: age of the farm owner, economic size, form of organization, land area, land lease use, percentage of tabulation, land price, future intentions of farmers, forms of support accessed, use of European funds. After applying the survey on a number of 276 farmers, an average use of 150 hectares per agricultural holding is observed, which indicates an area with medium-sized farms, classified as medium-sized commercial farms (42.4%). Although renting is the first option of farmers (48.2% of the total owning more than 70% of the land under lease), they would like it if economic and labor conditions allow them to acquire farm-owned land in the future (46% of respondents). All interviewed farms benefited from subsidies from the Agency for Payments and Investment in Agriculture.

Keywords: agricultural land, sustainable development, NW Region, Romania, sociological survey

INTRODUCTION

Current global trends of population growth, accelerated urbanization, and environmental change, which are associated with farmland invasion (Foley et al., 2011), farmland abandonment (Castillo et al., 2021), and farmland fragmentation (Gomes et al., 2019; Postek et al., 2019), have an influence on food production and its security (Godfray et al., 2010; Wu et al., 2014). For the coming decades, improving and maintaining food supplies will require efficient use of agricultural land (Fao, 2017). However, multiple factors (e.g. natural and environmental) that vary both temporally and spatially determine and affect agricultural land use (Akpoti et al., 2019; Lambin et al., 2001; Ndamani & Watanabe, 2017).

Agricultural production has enabled the population to grow and develop complex societies through social differentiation and territorial expansion (Paz et al., 2020). Land, as a factor of production, plays a vital role in the agricultural sector compared to other sectors (Marks-Bielska, 2013; Léger-Bosch, 2019). The efficient functioning of farmland markets is essential in determining efficient production systems and structures and their contribution to broader sustainable development at societal level (Wigier, 2018 et al.; Dumanski et al., 1998). Farmland markets supported by policies guaranteeing ownership regimes for farmers have been shown to contribute to the productive use of land as a resource by facilitating the transfer of land from less productive to more productive producers (Awasthi, 2009; Deininger et al., 2007; Bradfield et al., 2020). In recent years, land mobility has become a

significant issue worldwide, with increased concentration and competition for land ownership (Van der Ploeg et al., 2015), limiting the overall competitiveness of the agri-food sector and constraining potential opportunities for new entrants to access land (Zondag et al., 2015; Rounsevell et al., 2006). In general, land can be accessed either by permanent or temporary transfer (Geoghegan and O'Donoghue, 2018), and the distinguishing factor in land transfer is the power of control over the ownership rights package (Slangen and Polman, 2008). Property rights determine the social relationship between actors in relation to a valuable property object, namely agricultural land (Von Benda-Beckmann et al., 2006). Permanent land transfer can be achieved by purchase, sale or inheritance (Leonhardt et al, 2019).

The transfer of land by sale is usually very limited due to high transaction costs, imperfections in the credit market, and can also involve complex legal requirements and family problems. (Bradfield et al., 2020; Dramstad and Sang, 2010). For example, less than 2% of utilised agricultural area (UAA) is usually sold each year in European Union (EU) Member States (Geoghegan et al., 2018, Ciaian et al., 2012). The value is even lower in the United States, where it is estimated that only about 0.5% of agricultural land is sold annually (Nickerson et al., 2012).

The lease of land, as an alternative to the acquisition of agricultural land, is increasingly accepted as a mechanism for securing ownership of land. A major contributing factor to this trend is the high purchase price of farmland due to the general lack of land that comes to market for sale every year (Marks-Bielska, 2013; Fedchyshyn et al., 2019; Zavorotin et al., 2019).

Contemporary land use in Central and Eastern Europe is marked by the change of ownership with the collapse of the nationalized sector and the restitution of agricultural land to owners (Banski., 2017).

MATERIAL AND METHOD

The questionnaire-based sociological survey method, applied in the North-West Development Region of Romania, was used to highlight aspects related to contemporary agricultural land use and future trends of farmers. The questionnaire includes a number of 10 multiple-choice questions, relevant for characterizing and observing current and future trends in the sustainable development of agricultural land in the studied area:

1. Farm owner's age (Single answer)
   - □ < 20 years
   - □ 20 - 29 years
   - □ 30 - 39 years
   - □ 40 - 49 years
   - □ 50 - 60 years
   - □ > 60 years
2. What is the economic size of your farm? (Single answer)
   - □ < 2.000 euro - subsistence farm
   - □ 2.000 - 7.999 euro - semi-subsistence farm
   - □ 8.000 - 11.999 euro - small commercial farm
   - □ 12.000 - 250.000 euro - medium-sized commercial farm
   - □ > 250.000 euro - large commercial farm
3. The form of legal organization of your farm (Single answer)
   - I. □ Individual / administrator simple association form
   - II. □ Self-employed person (PFA)

□ Sole proprietorship (II)
□ Family business (FI)

III. Legal person
□ Limited Liability Company (SRL)
□ Joint Stock Company (JSC)
□ Other (please mention) …….

4. What is the total land area of your farm in hectares?

□ < 5 ha □ 150 - 199 ha
□ 5 - 29 ha □ 200 - 299 ha
□ 30 - 49 ha □ 300 - 399 ha
□ 50 - 99 ha □ 400 – 500 ha
□ 100 - 149 ha □ > 500 ha

5. What is the percentage area of agricultural land exploited under lease?

□ Does not exist □ 50% - 74%
□ < 25% □ 75% - 100%
□ 25% - 49%

6. What is the percentage of registration (registration in the land register) of the land owned by the farm?

□ 25% - 49%
□ 50% - 74%
□ 75% - 100%

7. What is the average price per hectare for farmland in your farm area?

□ < 2.000 euro □ 11.000 - 13.999 euro
□ 2.000 - 4.999 euro □ 14.000 - 16.999 euro
□ 5.000 - 7.999 euro □ 17.000 - 19.999 euro
□ 8.000 - 10.999 euro □ > 20.000 euro

8. What are your intentions regarding the expansion/reduction of agricultural land?

□ Maintaining the status quo
□ Expansion of areas by purchase
□ Lease land
□ Concentration / restructuring of plots
□ Reduction of areas through sale
□ Reduction of surfaces through abandonment
□ To lease land
□ To benefit from the inheritance
□ Other (please specify) …….

9. Forms of support accessed

□ APIA (Payments and Investment Agency for Agriculture)
□ AFIR (Agency for the Financing of Rural Investments)
□ Agricultural County Directorates
□ Farmers' associations
□ Input providers through advisory services
□ Other forms of support (please specify) …….

10. Have European Funds been accessed on your farm? (single answer)

□ Yes □ Not

The questionnaires were uniformly distributed at the level of the Northwest Development Region of Romania, to a number of 276 farmers. With the help of the Microsoft Excel program, the collected data were centralized and interpreted graphically, in order to carry out analyzes of the current situation and future trends in terms of the sustainable use of agricultural land.

RESULTS AND DISCUSSIONS

After analyzing the data from the Northwest Development Region of Romania, it can be seen (Figure 1) that the largest percentage is represented by farmers over 40 years old (63.8%). The fewest farmers are represented by the 20-29 year old category (9.4%), which means that young people are not attracted to work in agriculture due to a series of factors such as: declining birth rates, excessive urbanization, legislation in force and the income obtained in relation to the work performed. The category of people younger than 20 years old is missing, there are occasional young people who fall into this category, but are not owners of the farms where they operate.

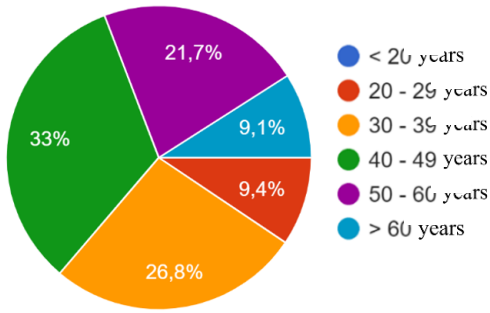

Figure 1. Age of the farm owner
Source: own processing based on data collected from the N-W Development Region of Romania

According to the economic size of the farms, they can fall into 5 distinct groups according to the legislation in force, namely: subsistence farms that produce entirely for their own consumption (<2,000 euros), semi-subsistence farms that ensure their own consumption and a small part of the agricultural production is marketed (2,000-7,999 euros, small commercial farms that market more than 50% of the agricultural production they produce (8,000-11,999 euros), medium-sized commercial farms that market the entire agricultural production (12,000-250,000 euros) , large commercial farms that market the entire agricultural production (>250,000 euros).

At the level of the North-West Development region of Romania, it is observed (Figure 2) that there is a very small number of subsistence farms of only 0.7%, most farms fall into the category of medium-sized commercial ones (42.4%). Small commercial farms have a significant percentage of 26.1%, followed by semi-subsistence farms with a percentage of 18.5%. Farms with incomes greater than 250,000 euros, i.e. large commercial ones, have a relatively small percentage at the regional level of 12.3%.

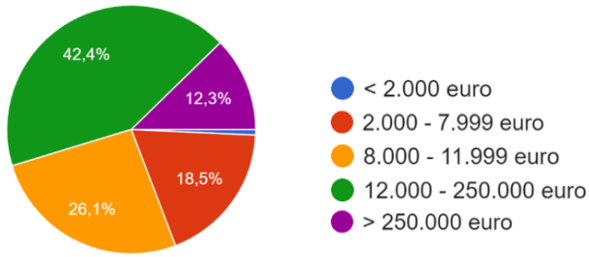

Figure 2. Economic size of farms
Source: own processing based on data collected from the N-W Development Region of Romania

According to the form of legal organization, it can be observed (Figure 3) that the largest share is owned by farms owned by natural persons (34.4%), followed by limited liability companies (27.9%) and authorized natural persons (20.3 %). Sole proprietorships account for only 13% of all farms in the region, and family businesses, joint-stock companies and agricultural companies together account for a small percentage of 4.4%.

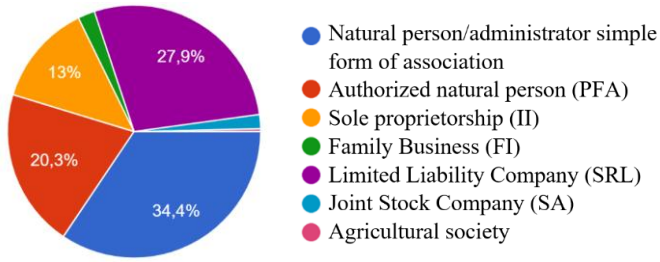

Figure 3. The form of legal organization of the farm
Source: own processing based on data collected from the N-W Development Region of Romania

The total area of land owned (Figure 4) by an agricultural holding in the region of interest is to the greatest extent, over 50%, between 50-99 ha (33.7%) and 100-149 hectares (20.7 %). It is observed that more than 25% of agricultural lands have areas between 150 ha and more than 500 ha, i.e. 150-199 ha (6.2%), 200-299 ha (7.2%), 300-399 (6 .5%) and larger than 500 ha (5.8%). The smallest areas of agricultural land are those smaller than 5 ha (1.1%) and those between 400 ha and 500 ha (1.4%).

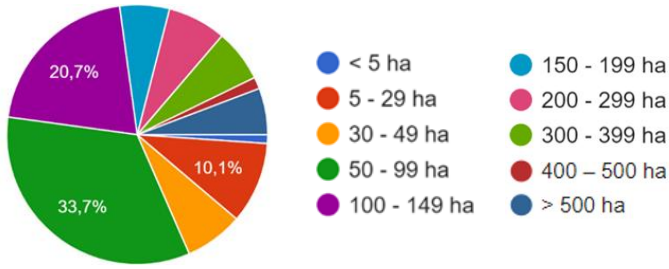

Figure 4. Total area of agricultural land
Source: own processing based on data collected from the N-W Development Region of Romania

In a percentage of 68.5% of the farms, they have more than 50% of the land exploited in lease (Figure 5), almost 50% of them have more than 75% of the land used in lease, which means that the farmers prefer this approach at the expense of buying agricultural land, which in some areas is expensive, and recovering the subsequent investment can be difficult. A relatively small percentage of 16.7% of farms owns less than 25% of land or none at all, with the rest of the land owned by the farm.

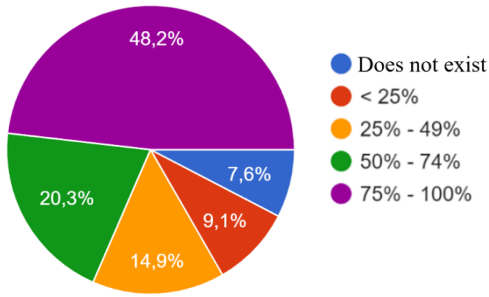

Figure 5. The percentage area of leased land
Source: own processing based on data collected from the N-W Development Region of Romania

It can be observed (Figure 6) that only 15% of the land owned by the farms in the region are registered in a percentage higher than 75% in the Land Register, at the level of Romania the systematic cadastre is in process, which aims to tabulate all land surfaces free of charge land The currently registered lands are mostly done through sporadic cadastre and partly through systematic cadastre, where the first stages have been completed. Almost 50% of the land is less than 25% or not tabulated at all, and in the categories 25%-49%, respectively 50%-74% are a percentage of 40% of farms.

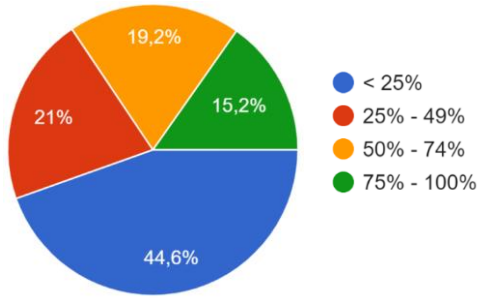

Figure 6. The percentage of agricultural land tabulation
Source: own processing based on data collected from the N-W Development Region of Romania

Regarding the price of agricultural land (Figure 7), the highest percentage of almost 60% is represented by the categories under 2,000 euros and between 2,000-4,999 euros with 31.9% and 27.9%, respectively. The categories 5,000-7,999 euros and 8,000-10,999 euros represent a total of 36.2%, and between 11,000 euros and over 20,000 euros is a percentage of only 4% of the total farms.

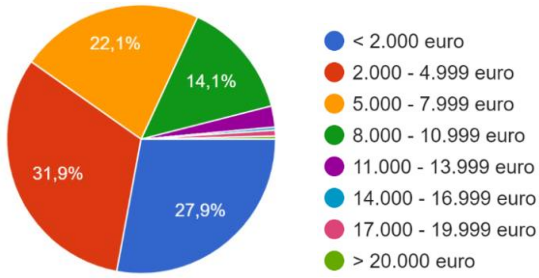

Figure 7. Average price per hectare of agricultural land
Source: own processing based on data collected from the N-W Development Region of Romania

Farmers' future intentions (Figure 8) focus on expanding land areas through purchase (46%) and maintaining current situations (48.9%), totaling a percentage of 94.9% of respondents. A significant percentage of 29% of farmers want to take over land on lease, and a percentage of 8.7% of farmers say that they would like to concentrate or restructure their plots due to low efficiency in terms of their exploitation. A small number of farmers answered that they would like to reduce their agricultural areas either by sale (9 farmers, representing 3.3% of the total) or by abandonment (5 farmers, representing 1.8% of the total). The lowest percentages were registered by farmers who in the future intend to lease land or to benefit from land tenure, with 4 responses each, totaling 2.8% of all farms that responded to the questionnaire in the North-West region of Romania.

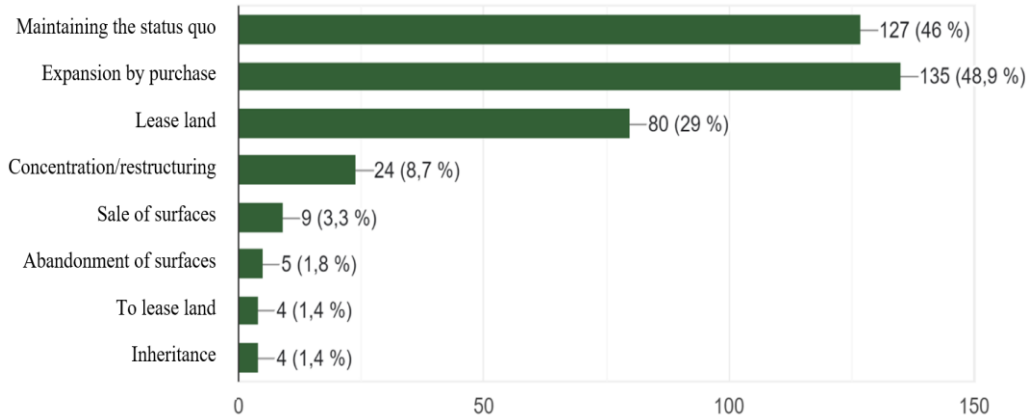

Figure 8. Farmers' future intentions on farmland
Source: own processing based on data collected from the N-W Development Region of Romania

Depending on the forms of support accessed (Figure 9), all surveyed farmers benefited from subsidies from the Agricultural Payments and Investments Agency (APIA). A relatively small percentage of 69 farmers (25%) received support from the Rural Investment Financing Agency. The fewest farmers accessed funds from imputation providers through advisory services (4.7%), respectively through farmers' associations (4%).

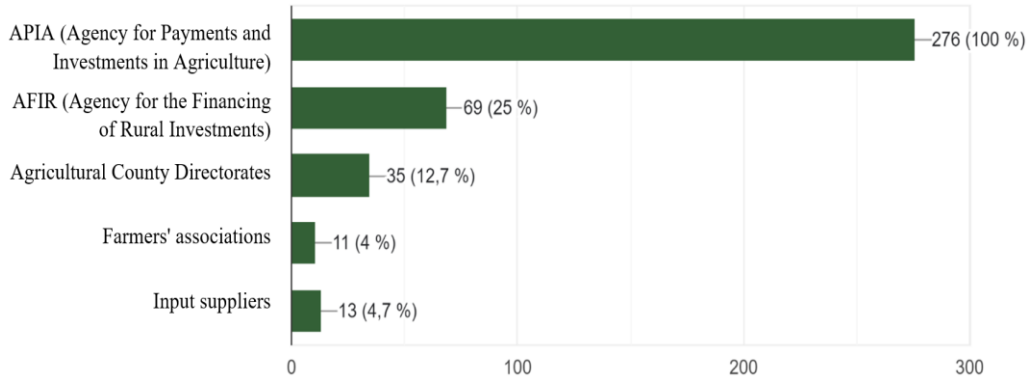

Figure 9. Forms of support accessed
Source: own processing based on data collected from the N-W Development Region of Romania

European funds (Figure 10) for the establishment of the farm, its development or other investments, were accessed by 107 interviewed farmers out of a total of 276, meaning a percentage of 38.8% of the total. It is observed that most of the farms were established and developed from their own income or bank loans, which reflects a relatively low capacity in terms of writing and winning projects financed by European programs dedicated to agriculture.

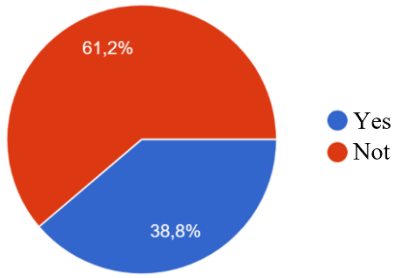

Figure 10. Accessing European Funds
Source: own processing based on data collected from the N-W Development Region of Romania

CONCLUSIONS

At the level of the North-West Development Region of Romania, an average use of 150 hectares per agricultural holding is observed, which indicates an area with medium-sized farms, included in the category of medium-sized commercial farms (42.4%). Farms owned by natural persons have the largest share (34.4%), followed by Limited Liability Companies (27.9%) and Authorized Natural Persons (20.3%), with an average age of owners over 40 year old.

Farmers in the region prefer to lease land (48.2% of the total owning more than 70% of leased land), with buying being relatively low due to prices, legislation and farmers' uncertainty about the future of farms. The lands owned by the farms are tabulated on average just over 25%, which indicates another factor in the low number of traded lands. Most plots have prices below 2,000 euros due to the lack of

completion of their cadastre, deficient land and low demand in many areas of the region.

Although leasing is the first option for farmers, they would like it if economic and labor conditions allow them to purchase farm-owned land in the future (46% of respondents). A relatively large number wants to maintain the current situation (46% of respondents) in the coming years.

Most farmers benefited from subsidies from the Agency for Payments and Investments in Agriculture (100% of those interviewed). As far as European Funds are concerned, only 38.8% have benefited from them in order to establish or develop farms.

REFERENCES

1. Akpoti, K., Kabo-bah, A. T., & Zwart, S. J. (2019). Agricultural land suitability analysis: State-of-the-art and outlooks for integration of climate change analysis. Agricultural systems, 173, 172-208.
2. Awasthi, M. K. (2009). Dynamics and resource use efficiency of agricultural land sales and rental market in India. Land use policy, 26(3), 736-743.
3. Bański, J. (2017). The consequences of changes of ownership for agricultural land use in Central European countries following the collapse of the Eastern Bloc. Land Use Policy, 66, 120-130.
4. Bradfield, T., Butler, R., Dillon, E. J., & Hennessy, T. (2020). The factors influencing the profitability of leased land on dairy farms in Ireland. Land Use Policy, 95, 104649.
5. Castillo, C. P., Jacobs-Crisioni, C., Diogo, V., & Lavalle, C. (2021). Modelling agricultural land abandonment in a fine spatial resolution multi-level land-use model: An application for the EU. Environmental Modelling & Software, 136, 104946.
6. Ciaian, P., & Kancs, D. A. (2012). The capitalization of area payments into farmland rents: micro evidence from the new EU member states. Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie, 60(4), 517-540.
7. Deininger, K., Jin, S., & Nagarajan, H. K. (2009). Determinants and consequences of land sales market participation: Panel evidence from India. World Development, 37(2), 410-421.
8. Dramstad, W. E., & Sang, N. (2010). Tenancy in Norwegian agriculture. Land Use Policy, 27(3), 946-956.
9. Dumanski, J., Terry, E., Byerlee, D., & Pieri, C. (1998). Performance indicators for sustainable agriculture. The World Bank, Washington, 115-1124.
10. FAO, F. (2017). The future of food and agriculture–Trends and challenges. Annual Report, 296, 1-180.
11. Fedchyshyn, D., Ignatenko, I., & Shvydka, V. (2019). Economic and legal differences in patterns of land use in Ukraine. Amazonia Investiga, 8(18), 103-110.
12. Foley, J. A., Ramankutty, N., Brauman, K. A., Cassidy, E. S., Gerber, J. S., Johnston, M., ... & Zaks, D. P. (2011). Solutions for a cultivated planet. Nature, 478(7369), 337-342.
13. Geoghegan, C., & O'Donoghue, C. (2018). Socioeconomic drivers of land mobility in Irish agriculture. International Journal of Agricultural Management, 7(1029-2020-362), 26-34.
14. Godfray, H. C. J., Beddington, J. R., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., ... & Toulmin, C. (2010). Food security: the challenge of feeding 9 billion people. science, 327(5967), 812-818.
15. Gomes, E., Banos, A., Abrantes, P., Rocha, J., Kristensen, S. B. P., & Busck, A. (2019). Agricultural land fragmentation analysis in a peri-urban context: From the past into the future. Ecological Indicators, 97, 380-388.

16. Lambin, E. F., Turner, B. L., Geist, H. J., Agbola, S. B., Angelsen, A., Bruce, J. W., ... & Xu, J. (2001). The causes of land-use and land-cover change: moving beyond the myths. Global environmental change, 11(4), 261-269.
17. Léger-Bosch, C. (2019). Farmland tenure and transaction costs: Public and collectively owned land vs conventional coordination mechanisms in France. Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie, 67(3), 283-301.
18. Leonhardt, H., Penker, M., & Salhofer, K. (2019). Do farmers care about rented land? A multi-method study on land tenure and soil conservation. Land use policy, 82, 228-239.
19. Marks-Bielska, R. (2013). Factors shaping the agricultural land market in Poland. Land Use Policy, 30(1), 791-799.
20. Ndamani, F., & Watanabe, T. (2017). Developing indicators for adaptation decision-making under climate change in agriculture: A proposed evaluation model. Ecological Indicators, 76, 366-375.
21. Nickerson, C.; Morehart, M.; Kuethe, T.; Beckman, J.; Ifft, J.; Williams, R. Trends in US Farmland Values and Ownership; U.S. Department of Agriculture, Agricultural Research Service: Lincoln, NE, USA, 2012.
22. Paz, D. B., Henderson, K., & Loreau, M. (2020). Agricultural land use and the sustainability of social-ecological systems. Ecological modelling, 437, 109312.
23. Postek, P., Leń, P., & Stręk, Ż. (2019). The proposed indicator of fragmentation of agricultural land. Ecological Indicators, 103, 581-588.
24. Rounsevell, M. D. A., Reginster, I., Araújo, M. B., Carter, T. R., Dendoncker, N., Ewert, F., ... & Tuck, G. (2006). A coherent set of future land use change scenarios for Europe. Agriculture, Ecosystems & Environment, 114(1), 57-68.
25. Slangen, L. H., & Polman, N. B. (2008). Land lease contracts: properties and the value of bundles of property rights. NJAS-Wageningen Journal of Life Sciences, 55(4), 397-412.
26. Van der Ploeg, J. D., Franco, J. C., & Borras Jr, S. M. (2015). Land concentration and land grabbing in Europe: a preliminary analysis. Canadian Journal of Development Studies/Revue canadienne d'études du développement, 36(2), 147-162.
27. Von Benda-Beckmann, F., von Benda-Beckmann, K., & Wiber, M. (Eds.). (2009). Changing properties of property. Berghahn Books: New York, NY, USA.
28. Wigier, M., & Kowalski, A. (2018). The Common Agricultural Policy of the European Union-the present and the future. EU Member States point of view. Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej-Państwowy Instytut Badawczy.
29. Wu, W. B., Yu, Q. Y., Peter, V. H., YOU, L. Z., Peng, Y. A. N. G., & TANG, H. J. (2014). How could agricultural land systems contribute to raise food production under global change?. Journal of Integrative Agriculture, 13(7), 1432-1442.
30. ZAVOROTIN, E., GORDOPOLOVA, A., TIURINA, N., & POTOTSKAYA, L. (2019). Differentiation of rent for agricultural-purpose land. DIFFERENTIATION, 19(3).
31. Zondag, M. J., Koppert, S., de Lauwere, C., Sloot, P., & Pauer, A. (2015). Needs of young farmers: Report I of the Pilot project: Exchange programmes for young farmers. Report produced for the European Commission.