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STRATEGIC DIRECTIONS FOR ROMANIA'S DEVELOPMENT – HORIZON 2050 – SUSTAINABLE FOOD SECURITY

ABSTRACT

Starting from the natural, demographic and economic resources of our country and from the general trends of the European Green Deal and of the “Farm to Fork” Strategy, the vision of the researchers of the Institute of Agricultural Economics (IAE) researchers regarding Romania's sustainable food security towards 2050 is based on four general objectives aimed at: 1) Increasing the role of Romanian agriculture as food security supplier; 2) Improving population's access to food and the quality of food; 3) Adapting agriculture to climate change and reducing greenhouse gas emissions; 4) Transforming the agri-food sector into an innovative sector. The strategic document presents the specific indicators and proposed targets to reach these rather ambitious objectives. To meet these targets, the policies, measures and necessary actions must take into consideration: changing the structure and diversifying the agricultural production so that the share of livestock production will increase to 40% by the year 2050; improving the valorisation of Romanian agricultural products through investment programmes in the agri-food processing industry; ensuring balance between large and small-sized farms through land policies aimed at: setting up or maintaining farmers, increasing the size of small farms, measures limiting the exaggerated increase in the areas of large farms and discouraging land speculation.

Key words: sustainable food security, Romania

JEL Classification: Q18

1. INTRODUCTION

Food security can be evaluated at different levels, but most references are made at macroeconomic level (worldwide, regional or national), without overlooking the microeconomic level, *i.e.* household and individual level.

1.1. CURRENT STATE OF FOOD SECURITY IN ROMANIA

1.1.1. Romania's score and place in Europe, according to the Global Food Security Index

The Global Food Security Index (GFSI), developed by the Economist Impact, is a score based on which a classification of countries is made in terms of state of food security. In the 2022 edition, four dimensions of food security were considered for the calculation of GFSI: accessibility; availability; quality and safety; sustainability and adaptation.

Romania ranks 45th among the 113 countries, with a score of 68.8 points and 23rd among the 26 European countries (for which the GFSI score was calculated), the average score in Europe being 74.8. The top three positions in this ranking were held by Finland (with 83.7 points), followed by Ireland (with 81.7 points) and Norway (with 81.0 points).

Table 1

Food Security Index (GFSI) values for Romania (out of 100 points)

	2015	2016	2017	2018	2019	2020	2021	2022
General score	67.7	68.7	70.9	69.2	70.5	71.7	69.3	68.8
1. Accessibility	87.8	88.5	88.4	85.8	84.5	84.0	83.7	85.1
2. Availability	53.0	55.7	53.6	53.4	58.0	63.4	62.1	60.6
3. Quality and safety	77.3	77.8	84.1	83.2	82.7	82.4	76.9	77.9
4. Sustainability and adaptation	47.6	47.6	53.7	50.5	53.7	53.7	50.4	47.1

Source: Data extracted from the *Global Food Security Index 2022* (Economist Impact, 2022)

In terms of the four dimensions of food security, in the year 2022, Romania had higher scores for accessibility (85.1) and quality and safety (77.9). It had lower scores in availability (60.6) and in sustainability and adaptation (47.1). These scores suggest that the main vulnerabilities of food security in Romania may come from two directions, namely food supply and environmental conditions.

1.1.2. Prevalence of severe or moderate food insecurity

An important indicator in terms of food security at microeconomic level is the prevalence of severe or moderate food insecurity, measured on the basis of the Food Insecurity Experience Scale (FIES), based on interviews addressed to individuals or households. This indicator measures the progress in reaching Target 2.1. of Sustainable Development Goals¹.

The prevalence of severe or moderate food insecurity represents an estimate of the percentage of population living in households where access to food is poor and insufficient. The percentage of population in severe or moderate food insecurity in Romania reached approximately 14% in the last decade. The percentage of population

¹ Target 2.1: By 2030, end hunger and ensure access of all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food throughout the year.

in severe or moderate food insecurity is almost double compared to the average of developed countries (North America and Europe) and almost three times higher compared to some European countries.

1.2. GLOBAL TRENDS (European Green Deal and “Farm to Fork” Strategy)

Global awareness of challenges associated with climate change materialised at the European Union level through the adoption of the European Green Deal. In the field of agriculture and food, the response of the European Commission to this complex challenge is the “Farm to Fork” Strategy, which has proposed a comprehensive approach to sustainable food systems.

The ambition of this strategy is to put the EU's food system on a sustainable path, sustainability being understood through the “fair, healthy, ecological” triad that must characterise the food system. This new approach is presented as an opportunity to improve lifestyles, health and environment. In this context, there is an urgent need to reduce agriculture dependence on pesticides and antibiotics, to reduce excessive fertilisation, to develop organic farming, to improve animal welfare and reverse biodiversity decline.

2. GOALS, INDICATORS AND TARGETS

2.1. A VISION FOR SUSTAINABLE FOOD SECURITY IN ROMANIA

The vision of attaining food security for the population in Romania involves the transformation of the agri-food system into a sustainable food system, which ensures food and nutritional security for the entire society, based on economic, social and environmental conditionalities that can generate food security for the next generations.

Four general objectives corresponding to the strategic vision have been proposed, namely:

- Increasing the role of agriculture as food security supplier;
- Improving population's access to food and the quality of food;
- Adapting agriculture to climate change and reducing greenhouse gas emissions;
- Transforming the agri-food sector into an innovative sector.

2.2. GENERAL AND SPECIFIC OBJECTIVES, SYNTHETIC INDICATORS AND TARGETS

2.2.1. General objective 1: Increasing the role of agriculture as food security supplier

2.2.1.1. Specific objective: Increasing the level of ensuring food consumption from domestic production (indicator: self-sufficiency ratio for the main agricultural products, with emphasis on those in short supply)

The relationship between food security and self-sufficiency needs to be addressed carefully, as self-sufficiency and food security are not overlapping, even though the two concepts are interacting in several aspects. Self-sufficiency focuses on one of the four pillars of food security, namely the availability of food, respectively on the origin of foodstuffs and the capacity of the country to produce sufficient food.

Table 2

Self-sufficiency ratio² targets in the main groups of agricultural products (%)

	2021	2030	2050
Cereals and cereal products	204.0	206.0	211.0
Vegetables and vegetable products, of which:	82.0	87.0	91.0
– Tomatoes	71.4	76.0	84.0
Fruit and fruit products, of which:	68.8	73.0	80.0
– Apples	84.4	90.0	92.0
Meat and meat products, of which:	66.8	83.0	99.0
– Pork	54.1	68.0	94.0
– Poultry meat	90.3	92.0	103.0
– Beef	81.0	85.0	92.0
– Sheep and goat meat	113.7	115.0	117.0

Source: Data for the year 2021 were extracted from *Population consumption availabilities in the year 2021*, NIS

The targets from the table above were calculated on the basis of forecasts on the evolution of production, consumption, imports and exports for the respective agri-food products. Groups of products such as meat, fruit and vegetables have been selected, as the largest deficits in the agricultural trade balance are found for these products. As a general observation, the self-sufficiency ratio in many groups of products is not satisfactory and has had negative evolutions compared to 2015, which is the base year in the previous 2018–2038 strategy.

² *Self-sufficiency ratio* is the percentage of food consumption covered from domestic production and is calculated according to the formula: $SSR = \frac{\text{Production}}{\text{Production} + \text{Import} - \text{Export} - \text{Variation of stocks}} \times 100$.

2.2.1.2. Specific objective: Stabilisation of domestic agricultural supply through the rehabilitation and modernisation of the irrigation system (indicator: effectively irrigated area)

Agricultural production volatility in Romania was evaluated on the basis of the coefficient of variation calculated for the period 2015–2020. The main conclusion is that crop products have higher volatility than products of animal origin (among which cereal volatility stands out, with 22%). One of the main causes for the high volatility of crop production in Romania is represented by the more frequent extreme weather events in recent years. In this context, the national irrigation system returns to the spotlight, as an essential element for the stabilisation of domestic agricultural supply. Its rehabilitation, modernisation and expansion represent the main investment directions to increase farmers' access to water resources for agriculture.

Given that the National Programme for the Rehabilitation of the Main Irrigation Infrastructure (NPRMII) is already in the implementation phase (in recent years, part of the planned investment objectives has already been executed), it seems realistic to define the area prepared for irrigation (modernised/ rehabilitated, including viable and marginally viable areas) at about 2 million hectares, which will ensure an effectively irrigated area of 1.4 million hectares.

Table 3

Targets for the effectively irrigated area (thousand hectares)

	2022	2030	2050
Effectively irrigated area	528	800	1400

Source: for the year 2022, NIS Tempo-Online

The effectively irrigated area depends on several factors that characterise the activity of the Associations of Water Users for Irrigations, such as: technical and financial capacity to irrigate, farmers' determination, as well as the general conditions in which they carry out their activity – availability of water resources for irrigations in the perimeter of farms, the annual weather conditions (rainfall), general situation of agricultural produce market, significant changes in production costs. At the same time, there is the problem of viability of existing water resources. The hydrology experts estimate that nationwide, the maximum area that could be irrigated, in terms of water resources, does not exceed 2 million hectares and they propose a modern approach, compared to the current architecture of the irrigation system, which could lead to increased resources and efficiency of water use in agriculture; this implies fostering the use of irrigation systems with high efficiency, such as drip irrigation systems, construction of hydrotechnical facilities in hilly and mountain areas, which produce green energy and supply water to farms through gravity water systems, supporting farm equipping with modern technology (humidity sensors, access to satellite data, smart drones) for crop monitoring to optimise irrigation water consumption.

2.2.1.3. Specific objective: Acquiring the status of net exporter of agri-food products (indicator: agri-food trade deficit/surplus)

In the last thirty years, Romania had an almost permanent agri-food trade deficit. There are several factors that contributed to the increase of imports and of the deficit in the Romanian agri-food trade balance. Romania's joining the EU meant an unprecedented expansion of the foreign agri-food trade: compared to 2006 (the last year before accession to the EU), in 2021 the value of exports was 11.2 times higher, and the value of imports 4.2 times higher. The agri-food trade balance with the EU has remained negative, and is partially offset by the trade balance with non-EU countries, which has been positive since 2010. Overall, Romania's agri-food trade balance has remained negative.

Table 4

Targets for Romania's foreign agri-food trade

	2021	2022	2030	2040	2050
Total exports (million euros)	9,588	11,980	14,581	17,388	20,664
Total imports (million euros)	10,179	13,263	15,266	16,804	18,867
Total balance (million euros)	-591	-1,283	-685	+584	+1,798
Share of processed products in total exports (%)	38	40	43	47	50
Share of processed products in total imports (%)	66	65	64	64	63

Source: for the years 2021 and 2022, calculations based on Eurostat data

For Romania to become a net exporter of agri-food products, on the long term, it is necessary, first of all, to increase domestic production of basic products in deficit (meat, milk, fish, fruit and vegetables), in order to reduce imports and increase exports. An absolutely necessary condition is investment in the growth and significant diversification of food industry. Romania will certainly continue to remain an important producer and exporter of cereals and oilseeds (staple products) on the medium and long term. These products will also continue to have a significant share in the total value of exports in the future. The increase of the importance of processed products in exports can only come as a result of coherent long-term programmes for the development of medium-sized processing units, capable to capitalise on local and regional resources.

2.2.2. General objective 2: Improving population's access to food and the quality of food

2.2.2.1. Specific objective: Improving access to food and food diversity (indicators: share of food consumption expenditure in total household consumption expenditure and calorie consumption)

Unlike other developed countries in the European Union, where the phenomenon of demand saturation in certain food products can be noticed (in pork, for example), food demand in Romania has an upward trend in many basic

products, such as meat, vegetables, fruit and fish. The improvement of food quality and dietary diversity have been noticeable only in recent years, the data on the evolution of food consumption in Romania indicating specific developments for a country that has an unsaturated and very elastic demand for products considered superior from a nutritional point of view.

Table 5

Targets for food expenditure and calorie consumption

	2021	2030	2050
Share of food consumption expenditure (food and non-alcoholic beverages) in total consumption expenditure (%)	33.4	30.0	15.0
Calorie consumption (calories/capita/day)	3558	3500	Decreasing, around 2900–3100

Source: for the year 2021, NIS data

Romania is quite far from the EU-27 in terms of population's food purchasing power, and the share of food consumption expenditure in total consumption expenditure actually reflects the low level of population's incomes. As an example, in the year 2015, in Romania, the share of food expenditure was, on average, 34.4% (at EU level, the average share was 14.7%). This indicator has evolved quite slowly over time, in the context of the inelastic food demand; from 2011 to 2021 (in ten years of economic growth), this share decreased by 8 percentage points (from 41.7% to 33.4%). In this context, it can be predicted that the share of consumption expenditure will get close to the current average level of the European Union towards 2050.

If we adopt the hypothesis of transition to healthier diets, as it has been mentioned in the EU strategies that are being implemented, it is reasonable to expect a diminution of demand for certain groups of products, mainly meat and meat products, sugar, fats, even cereals, and an increase for vegetables, fruit and fish. In this context, a diminution of the daily calorie intake is expected, from its actual level of 3558 calories to about 2900 calories in the year 2050 (the 2900–3100 calorie intake is an average proposed at European level for the years 2030–2050).

2.2.3. General objective 3: Adapting agriculture to climate change and reducing greenhouse gas emissions

2.2.3.1. Specific objective: greenhouse gas neutrality of agriculture (indicator: reduction of greenhouse gas emissions in agriculture)

In agriculture, agricultural soils have the largest contribution to greenhouse gas emissions (46.61%), caused by nitrous oxide (N₂O) coming from chemical and natural fertilisers and from the urine and manure of grazing livestock, and from livestock farming due to methane (CH₄) resulting from enteric fermentation (39.46%) and from poor manure management (9.19%). The EU aims to reach

climate neutrality by the year 2050, with the intermediate goal to reduce emissions by 55% by the year 2030 compared to 1990.

In Romania, greenhouse gas emissions in agriculture were by 46% lower in 2020 compared to 1990, as a result of the change in farmland ownership and shift to the market economy system, which led to the decrease of agricultural production and of livestock herds. The reduction of greenhouse gas emissions in agriculture by 55% in the year 2030 as compared to 1990 seems to be an achievable target, while in 2050 emissions will be lower by 70%.

Table 6

Targets for reducing greenhouse gas emissions in agriculture

	2005	2020	2030	2050
Reduction compared to 1990 (%)	-39.59	-46%	-55%	-70%

Source: Authors' predictions based on data from United Nations Framework Convention on Climate Change (2022), *National Inventory Report. Romania 2021, Romania's Greenhouse Gas Inventory 1989–2020*

2.2.3.2. Specific objective: Improving soil quality and protecting water resources (indicator: amount of chemical fertilisers used)

Chemical fertilisers are usually applied in agriculture to sustain the production of food, but the EU aims to reduce their utilisation by 20–25% by the year 2030. In the year 2020, in Romania, 738,453 tonnes active substance of chemical fertilisers were used (63.5% nitrogen, 25.4% phosphorus and 11.1% potash), the consumption of chemical fertilisers being 78.6 kg/ha arable land, much lower than the EU average of 157.0 kg/ha arable land³.

Table 7

Targets for chemical fertiliser consumption

	2020	2030	2050
Quantity of chemical fertilisers used in agriculture (tonnes)	738,453	701,530	590,762
Reduction (%)		-5%	-20%
Average quantity per hectare of arable land (kg/ha)	78.6	74.4	62.7

Source: Authors' predictions

It is desired that the reduction of chemical fertilisers use will be supplemented by production techniques (crop rotation, for example) and by the use of organic fertilisers, so that it does not lead to the diminution of production and harvest quality. However, this aspect is debatable, because most impact studies conducted in recent years have signalled out that the diminution of the quantity of fertilisers applied will lead to significant diminutions of average yields, of agricultural productions and of food security implicitly.

³ <https://data.worldbank.org/indicator/AG.CON.FERT.ZS>

2.2.3.3. Specific objective: Expansion of organic agriculture (indicator: share of area under organic farming system in total agricultural area)

The European Commission set the target that by the year 2030, at least 25% of the EU's utilised agricultural area should be under organic farming, considering that in the year 2020 the average was 9%. In the year 2020 in Romania, the area under organic farming totalled 468,887 ha (double than that in 2016), with 10,210 operators registered in the organic farming system. In the organic crop structure, pastures and hayfields cover 37%, followed by arable crops, with cereals the main crop, which cover 24% of the total organically farmed area; in the livestock sector, cattle are the most numerous organically certified animals.

Table 8

Targets for the agricultural area under organic farming system

	2020	2030	2050
Share of agricultural area under organic farming system in total utilised agricultural area (%)	3.6	8	20

Source: Authors' predictions

For farmers to adopt this type of farming without decreasing their incomes, it is important for them to receive support through subsidies, both for the conversion of land to organic farming and for maintaining the land in this type of farming system, as organic products have lower yields but their prices are higher. In this context, the increase of population's incomes and of consumers' concerns related to healthy food and unpolluted products are of utmost importance, and these will increase in the next years.

2.2.4. General objective 4: Transforming the agri-food sector into an innovative sector

2.2.4.1. Specific objective: Supporting RDI investments in the development of innovative technologies (indicator: gross RDI expenditures for agricultural sciences)

Romania allocates 0.02% of GDP each year for agricultural science research, being the country with the lowest level of research, development and innovation (RDI) in this sector compared to the other EU member states⁴. The financing of agricultural science research mainly comes from the public sector, which accounts for more than two-thirds of the RDI expenditure in agriculture. The business sector in Romania's agriculture has a low contribution to research financing, and it is advisable to foster the creation of RDI partnerships between research centres (including universities) and farmers for the development of technical and technological solutions and facilitation of the exchange of experience and transfer of good practices.

⁴ EUROSTAT data for the year 2020 [RD_E_GERDSC]

Table 9

Targets for gross RDI expenditure dedicated to agricultural sciences (euro/capita)

Operators	2020	2030	2050
Tertiary agricultural education	0.4	2.1	5.6
Public (research institutes/centres)	2.1	3.2	5.5
Agricultural business sector	0.3	1.0	2.4

Source: Authors' predictions

By increasing the interest of all actors involved in RDI partnerships through the sharing of research expenses, RDI investments in Romania could reach 1/3 of the current EU average by the year 2030, and the current EU level in the year 2050.

2.2.4.2. Specific objective: supporting partnerships for horizontal and vertical chain integration (indicator: market share of agricultural cooperative organisations)

The cooperative movement in Romania's agriculture is growing, but its importance in the agri-food chains is small, as it involves an insignificant part of farmers. Thus, 2071 agricultural cooperatives had been established by the autumn of 2021, totalling 8172 shareholder cooperative members (out of total 2.8 million farms). These add to 131 functional producer organisations, most of which are authorised in cereals and oilseeds. The market share of agricultural cooperatives in Romania is under 2%⁵.

Table 10

Targets for the market share of agricultural cooperatives in Romania

	2020	2030	2050
Market share of cooperative organisations in total agricultural production of the agricultural sector (%)	< 2%	13%	40%

Source: Authors' predictions

In the European Union, out of 13 million farmers, 7 million are organised into approximately 22,000 cooperatives, involved in the processing and marketing of 40% of the total agricultural production of the agricultural sector⁶. Cooperatives have significant market shares in the agricultural markets of the European countries, being one of the mechanisms that contribute to their competitiveness in the EU.

2.2.4.3. Specific objective: Professionalisation of farmers and agricultural workforce (indicator: rural population participation in continuous training courses)

Increasing the level of professional training, especially of farm heads, as well as of agricultural workers, has become vital in the context of the implementation of new production technologies and methods: their professional training is a key

⁵ <https://www.zf.ro/zf-agropower/zf-agropower-cooperativele-agricole-romania-au-cota-piata-1-5-2-iau-20255179>

⁶ COGECA (2014) Development of Agricultural Cooperatives in the EU, 2014

component to face the challenges of the coming years. Currently, the participation in continuous training courses of the Romanian rural population has been increasing, yet still below the EU average (12.2%).

Table 11

Targets for rural population participation in continuous training courses

	2020	2022	2030	2050
Rural population participating in training or vocational courses (%)	4.9	7.1	10	14

Source: Authors' predictions

To be able to work with the new technologies, the rural workforce needs to narrow the skills gap, so that by the year 2050 the participation rate in training or vocational courses will be comparable to the EU average.

3. POLICIES, MEASURES AND ACTIONS FOR REACHING THE TARGETS

3.1. CHANGE OF AGRICULTURAL PRODUCTION STRUCTURE

The objectives of increasing food security and self-sufficiency level of agricultural production in Romania are under risk of remaining only a mere desideration in the situation where the current structural trends of the Romanian agricultural production will be maintained, namely the increased specialisation in the production of cereals and oilseeds.

Table 12

Structure of agricultural production in Romania, compared to France and Poland, 2021 (%)

	Cereals	Oilseeds	Fodder crops	Vegetables	Plants and flowers	Potatoes	Fruit	Wine	Animals	Animal products
FR	16.2	3.4	9.1	4.2	4.2	4.5	3.5	12.2	23.1	15.2
PL	17.3	4.5	3.6	10.0	0.5	2.1	6.1	...	30.5	20.0
RO	29.5	9.4	8.3	12.7	2.4	2.3	8.6	1.5	11.0	12.7

Source: *Economic accounts for agriculture - values at constant prices (2015 = 100)* [AACT_EAA03_custom_6626862], Eurostat.

The comparative data on the agricultural production structure in Romania and other two EU member states that have a positive trade balance (France and Poland) show that in Romania, the share of cereals and oilseeds in agricultural production is almost 40%, while animals and animal products account for 23%. By comparison, in France, cereals and oilseeds account for 20%, and animal products 38%; in Poland, cereals and oilseeds together represent 22%, and animals and animal products 50%.

From this perspective, a conclusion emerges, namely if the current directions and structures of Romanian agriculture are maintained in the next years, the agricultural trade balance deficit will continue to increase and will not improve in the future. That is why a serious reconsideration of support and sectoral public policies is needed, for farmers to get oriented towards products with high value added, mainly in the livestock sector, horticulture, wine and fruit production. The diversification of the Romanian crop production and the increase in the share of animal production would get the structure of Romania's agricultural production closer to that of other European countries with similar conditions and represent a tangible objective, over a time horizon of 30 years.

3.2. IMPROVING THE VALORISATION OF ROMANIAN AGRICULTURAL PRODUCTS

In Romania, agriculture has a high share in the value added of the entire food chain, in contrast to the average level of the EU, where agriculture has a much lower share in the total value of food products. At the same time, the low share of food industry in Romania (half compared to the EU average) reveals a poor capitalisation of domestic primary products through processing activities.

The analysis of the value added structure of Romania's agri-food chain highlights a structural imbalance between the food supply links, indicated by the high share of primary agricultural production, and a growing distribution sector corroborated with the consumer services sector, to the detriment of food industry, whose low share in the value added of the food chain is a factor that weakens the agri-food sector competitiveness.

An analysis that corroborated the ranking of the top ten agri-food products imported in the year 2021 with the ranking of Combined Nomenclature groups, taking into consideration Romania's agricultural production potential, identified eight classes of products that should be in the attention of authorities for finding solutions to overcome the difficulties they are facing⁷.

3.3. ENSURING BALANCE BETWEEN SMALL, MEDIUM AND LARGE-SIZED AGRICULTURAL HOLDINGS

Romania's agriculture is characterised by a polarised farm structure and a very large number of farms (about 2.9 million in 2020). The small farms, under 10 hectares, account for 95.9% of the total number of farms, accounting for 31.4%

⁷ 1. Manufacture of grain mill products, starch and starch products, 2. Manufacture of bread, of fresh pastry goods and cakes, 3. Manufacture of biscuits and rusks; manufacture of preserved pastry goods and cakes, 4. Production and preserving of meat (that does not include poultry meat), 5. Processing and preserving of poultry meat, 6. Manufacture of meat products (poultry meat included), 7. Processing and preserving of fruit and vegetables, 8. Manufacture of dairy products and cheeses.

of the utilised agricultural area, while the large farms, over 100 hectares, account for 0.5% of the total number of farms, but operate almost half of the utilised agricultural area (47.8%). This polarisation process has gradually intensified, following our country's accession to the European Union and land market liberalisation.

Land policy should be correlated with the policy orienting the structure of agricultural holdings. If the policy orienting the structures has the established objective to ensure a balance between small and large-sized holdings, it may be useful to set up a land development agency, which would correct the effects of the simple functioning of land market. Such an agency, with such an objective, will need the introduction of a new instrument (following the French model, for example), namely the issuance of land operation authorisations, from a certain level up, to limit the exaggerated increase of the area of holdings. For an effective intervention on the land market, the land development agency needs to be granted a pre-emption right to purchase the agricultural land put up for sale by land owners. By using the pre-emption right, the agency can contribute to the setting up of farmers or maintaining them in activity, to the increase of farm size, to maintain the balance between the different types of farms and to discourage land speculation (through requests to re-examine the price if it is too high compared to the market value).

4. RESOURCE NEEDED TO IMPLEMENT THE OBJECTIVES

4.1. HUMAN RESOURCES (POPULATION EMPLOYED IN AGRICULTURE)

With the restructuring of the agricultural sector and the gradual diminution of the number of farms, the labour force need will decrease, from 878 thousand persons in 2022, to 640 thousand in 2030 and 320 thousand in 2050. The analysis by age groups of the population employed in agriculture, forestry and fisheries in the year 2022, suggest that there are no risks in covering the need for labour from domestic resources. However, it must be noted that the current labour force needs actions to increase its professionalisation level, so as to cope with the technological advance and increase its productivity.

4.2. NATURAL RESOURCES (AGRICULTURAL LAND AND WATER RESOURCES)

With an agricultural area of over 14 million hectares, Romania is one of the countries with significant natural resources used in agriculture. In the year 2020, according to the General Agricultural Census data, the utilised agricultural area totalled 12.76 million hectares. The land use structure by farm size classes indicates the

specific situation of Romania, namely the polarisation of land ownership and the land grabbing phenomenon.

In recent years, there have been concerns with regard to the land grabbing phenomenon in Romania, as the prices of land transactions were much lower than the European prices, thus making agricultural land very attractive for foreign capital. A 2016 estimate showed that the agricultural land owned by foreign companies or Romanian companies with foreign shareholders totalled 958 thousand hectares, *i.e.* 8% of agricultural land (or 12% of arable land). The legislative changes subsequent to this moment and the increase of farmland prices in Romania (from 1958 euro/ha in 2016 to 7601 euro/ha in 2021), have led to the mitigation of fears related to land grabbing.

As regards water resources, there are regions in Romania where water stress⁸ is very high, located in the north-eastern, eastern and south-eastern parts of the country. By the year 2030, water stress will intensify, and two times higher increases are expected in the eastern part of Romania and in the south (MEWF, 2023). Climate change represents one of the main factors impacting water resources, and the sustainable water management becomes a challenging issue. The vulnerability induced by temperature dependence and rainfall regime require valorisation and protection of water resources against depletion and degradation in terms of quality.

Moreover, the expectations of international organisations such as FAO and OECD concerning the increase of agricultural production by the year 2050 are cautious due to limited natural resources, water resources in particular.

4.3. FINANCIAL RESOURCES (PUBLIC SUPPORT FROM THE EU AND STATE BUDGET FUNDS)

Romania's National CAP Strategic Plan for the period 2023–2027 (NSP 2023–2027) was approved in late 2022 and has been implemented since 2023. Unlike the previous programming documents, the current NSP includes all interventions financed from European funds, namely (both coupled and decoupled) direct payments and sectoral interventions (for fruit and vegetables, for example), funded from EAGF (European Agricultural Guarantee Fund), as well as the rural development interventions (mainly investments), financed from EAFRD (European Agricultural Fund for Rural Development), and where appropriate, even interventions financed from national budget (transitional national aid, for example).

Out of the total NSP 2023–2027 budget of 15.8 billion euros, for direct payments are allocated 9.78 billion euros, out of which 6.27 billion euros for crop production (summing up the basic payment, the redistributive payment, coupled

⁸ Water stress is the ratio of total water extractions to available renewable reserves of surface and ground water

support and young farmer payment) and 1.05 billion euros for the livestock sector (coupled support); eco-schemes are allocated 2.19 billion euros for the crop production sector and 247.9 million euros for the livestock sector. Another 151 million euros are allocated to sectoral interventions (fruit and vegetables, bee farming and viticulture). Rural development interventions amount to 5.87 billion euros (from EAFRD and from the state budget), for investments on agricultural holdings (for irrigations inclusively), for environment and climate (also for animal welfare), as well as for the development of rural areas (including the LEADER programme for local community development).

5. LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

The Common Agricultural Policy (CAP) is very important for securing the future of agriculture as well as for achieving the objectives of the European Green Deal. CAP 2023–2027 is the result of an ample process of reform of European agricultural policies that began in 2018, whose principles seek to ensure a sustainable future for European farmers, to provide better targeted support to smaller farms and to give the EU member states greater flexibility to adapt measures to local conditions.

CAP 2023–2027 contains a series of policy reforms meant to support transition to sustainable farming in the EU through:

- supporting agriculture for a greater contribution to the objectives of the European Green Deal;
- targeting the support to reach those most in need;
- strengthening farmers' position in the supply chain and fostering the agri-food sector competitiveness;
- promoting research, knowledge sharing and innovation considered essential for the development of a smart and sustainable agricultural sector.

It is expected that the guidelines of the current CAP reform will be followed after 2027, even though the proposed targets may be still subject to a series of adjustments depending on the concrete developments following implementation and other conjunctural situations than can even accelerate the pace of reforms, such as the war in Ukraine.

At national level, for a better use of the European support, certain priorities can be identified for the improvement of the necessary legal framework for the implementation of the proposed programmes meant to improve food security in Romania.

The following measures would be important to support the change of the agricultural production structure: adoption of a legislative framework referring to pig farming and valorisation (to control African Swine Fever); continuing to finance animal welfare measures (for pigs and poultry) with extension to other species; establishment a risk management tool in agriculture; development of a state aid scheme for electricity and heating/cooling systems based on renewable

sources, used in agriculture; introducing support tools for activities in the bio-economy sector.

In order to improve the valorisation of Romanian agricultural products, it would be useful to: improve legislation on the certification of agri-food products; periodically update the National Action Plan for the development of organic production in Romania; provide temporary fiscal facilities for the processing of domestic agricultural raw materials.

The balance between large and small farms can also be ensured by: completion of the agricultural land registration process; setting up a rural land development agency.

6. IMPACT ASSESSMENT

6.1. ESTIMATING THE EFFECTS OF THE “FARM TO FORK” STRATEGY

The prospects of the European Union’s economy in the next decades will be decisively influenced by the provisions of the European Green Deal; in the case of agriculture, these provisions are found in the “Farm to Fork” Strategy, which explicitly establishes certain quantitative targets for the year 2030: 50% reduction in pesticide use, reduction of the use of chemical fertilisers by 20%, 50% reduction of the sales of antimicrobial substances for animals, increase to at least 25% of the share of land under organic farming.

Yet, the adoption of these quantitative targets on the use of chemical inputs represents quite a controversial initiative for farmers. The effects of these potential measures on agricultural production and farm competitiveness seem to affect the economic results of the agri-food sector in the short and medium term, and most assessments made by international research institutions show that they will lead to the diminution of agricultural production in the European Union, a decrease of farmers’ incomes, an increase in agricultural prices, in parallel with an increase of the EU’s agricultural imports from third countries. At the same time, these effects are differentiated by countries, depending on the production structure, climate zones, dependence on imports, etc.

6.2. MEDIUM-TERM PROSPECTS FOR EUROPEAN AGRICULTURAL MARKETS

The successive EU enlargements after 2004 have led to a significant increase of cereal production in the Union (through CAP funding and investments). According to forecasts for the next ten years, a slowing down in productivity growth and stagnation in EU’s cereal production is expected. The EU will remain competitive and will continue to be a net exporter of wheat and barley and a net

importer of maize and rice. Romania has still potential to increase its total production of cereals (including maize). The production surplus expected on the horizon of 2030 should be directed more towards the EU, and an important part to the domestic granivore farming sector, mainly pig farming.

For oilseeds, forecasts indicate that in the medium term, the EU will remain a net importer of oilseeds, but imports will decrease in volume. Romania, the largest sunflower producer in the EU, exported 53% of the usable production, out of which 87% to the EU. It is expected that by the year 2030 Romania will increase both its production and exports to the EU. In the year 2021, 45% of the usable production went to the agro-processing industry. Romania is a net exporter of edible oils, mainly crude sunflower oil. In the medium and long term, the target should be a higher production of refined oil for domestic consumption and a decrease in imports. Romania is a net importer (mainly of soybean meal), and in the medium and long term the target should be to reduce these imports and direct the additional available sunflower meal from domestic production to the Romanian livestock sector.

In pork, although the trend in the EU is production decrease, as a result of the decrease in consumption (due to changes in the consumption pattern, on the one hand, and the need to reduce the environmental impact), the global demand is expanding, due to population growth and increase of its incomes. In the last two decades, Romania was a net importer of pork, and the trade balance deficit for this product has greatly increased in the last ten years. Even though the Romanian food consumption pattern will tend to get in line with that in the developed countries of the EU, pork will remain one of the basic products of the domestic food consumption basket. Therefore, it is expected that domestic pork production will increase in the medium and long term. The decrease in production costs (through the increase in production efficiency mainly determined by production concentration in specialised farms) is the necessary condition for this evolution.

The EU is self-sufficient in poultry meat (112% in 2021), and production is expected to increase in the medium term, determined by the European consumers' tendency to substitute pork for poultry in their diet. The EU is the third world exporter of poultry meat. In the last two decades, Romania was a net importer of poultry meat, except for a three-year period (2011–2013), when the surplus resulted from exports on the European market. Since 2016, poultry meat exports have had an upward trend, mostly on the EU market. Since 2020, exports have also intensified on extra-EU markets, the final result being a decrease in the trade deficit. A continuous increase of the domestic poultry meat production is expected in Romania, which will contribute to the increase of exports and to the diminution of the growth rate of imports, so that in the medium and long term the trade balance will become positive.

The European Union is self-sufficient in beef, yet beef production, consumption and exports have been trending downwards. In the Romanian food

consumption pattern, beef ranks third in meat consumption. Beef exports have increased for the last three years, but imports have increased at a faster rate, resulting in a negative balance. A slight increase of beef cattle herds is expected in the short and medium term, which will result in the decrease of imports. The arguments in favour of increasing domestic production would be that the price of beef from these breeds is quite high, resulting in greater farm efficiency.

7. CONCLUSIONS

Food security has a series of vulnerabilities in Romania, according to the evaluations by international bodies (Economist Impact and FAO). The Economist Impact evaluation, based on the Global Food Security Index (GFSI) shows that the main food security vulnerabilities in Romania may result from two directions, namely from food supply and environmental conditions. The food availability variables had a low and decreasing score, due to problems generated by the insufficiency of domestic agricultural supply, by production volatility and dependence on imports implicitly, which place Romania on the 50th place in the global hierarchy and on the 26th place in Europe. The breaking down of scores by indicators leads to the conclusion that in Romania the policies for combating climate effects on natural resources are not sufficiently coordinated and consistent.

The vision of sustainable food security towards 2050 is based on four general objectives aimed at:

- 1) Increasing the role of Romanian agriculture as food security supplier;
- 2) Improving population's access to food and food quality;
- 3) Adapting agriculture to climate change and reducing greenhouse gas emissions;
- 4) Transforming the agri-food sector into an innovative sector.

The specific indicators and the targets proposed for reaching these rather ambitious objectives are presented in the strategic document, the materialisation of which being conditioned by a change of paradigm in the functioning of agriculture and agri-food system and its correlation with the country's natural, demographic and economic resources.

To reach these targets, the necessary policies, measures and actions must have in view:

- Structure modification and diversification of agricultural production, so that by the year 2050, the share of the livestock farming sector will increase to 40%;
- Improving the valorisation of Romanian agricultural products through investment programmes in the agro-processing industry;
- Ensuring a balance between the small and medium-sized agricultural holdings through land policies aimed at: maintaining or setting up of farmers,

increasing the size of small farms, measures to limit the exaggerated increase in the area of large holdings and to discourage land speculation.

REFERENCES

1. Alexandri, C. (coordinator), 2020 – *The agricultural sector and rural area in the Covid-19 crisis: food security challenge*, Romanian Academy, Bucharest.
2. EC, 2020 – Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – *A “Farm to Fork” Strategy for a fair, healthy and environmentally-friendly food system*, European Commission, Brussels.
3. EC, 2022 – *EU agricultural outlook for markets, income and environment, 2022–2032*. European Commission, DG Agriculture and Rural Development, Brussels.
4. Economist impact. Global Food Security Index 2022. Available at: <https://impact.economist.com/sustainability/project/food-security-index/>.
5. Hera, C. (coordinator), 2017 – “Project 5. Food Security and Safety”, in *Romania's Development Strategy for the Next 20 Years*, Romanian Academy Publishing House, Bucharest.
6. Luca, L., (coordinator), 2023 – *Food Security, as an element of the Common Agricultural Policy and Romanian agriculture in the European context. Challenges for 2023–2027*, SPOS study no. 1, European Institute of Romania, Bucharest.
7. Ministry of Environment, Waters and Forests (MEWF), 2023 – Study for the development of the national strategy on the prevention and combatting desertification and land degradation 2019-2030 [in Romanian]. Available at: <https://www.mmediu.ro/app/webroot/uploads/files/Strategia%20Nationala%20privind%20Prevenirea%20si%20Combaterea%20Desertificarii.pdf>.
8. National Institute of Statistics (NIS), 2022 – *Population consumption availabilities in the year 2021*, Bucharest.
9. Otiman, P.I. (coordinator), 2023 – *Romania's agriculture and where is it heading to?! (1991-2007-2023)*, Romanian Academy Publishing House, Bucharest.
10. United Nations Framework Convention on Climate Change, 2022 – *National Inventory Report, Romania 2021, Romania's Greenhouse Gas Inventory 1989–2021*. Available at: <https://unfccc.int/documents/227662>.
11. *** Eurostat.
12. *** Tempo on-line, National Institute of Statistics, Bucharest.