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National Strategy for Agriculture in Romania – Horizon 2035

Abstract: *In this paper we formulate and develop foundation targets for the Romanian agri-food sector in the short, medium and long terms. The national strategy must have in view the main impact trends such as: innovation, knowledge transfer, institutional cooperation and re-organisation, infrastructure development, cohesion between the local, regional, national and European policies and projects. The development in the world of tomorrow, Horizon 2020-2035, is expected to include: significant technological advances in biology, genetics and agriculture; development of communication, IT, cognitive sciences; China's economic rise; European demographic decline; European Union (EU) economic stagnation and gradual loss of competitiveness in the face of new emergent countries; climate changes. In this context, the conditionality of the population's food security draws attention to major issues that Romania will face in the medium and long terms, such as: population decline and aging, progressive depletion of the productive potential of soil in the absence of supporting measures, and research fragility for agriculture sector. To answer the questions related to food safety and security in Romania towards 2030-2035, SWOT analysis was used for the following products: cereals, vegetables, fruit, meat and processed products. The analysis revealed certain vulnerabilities: Romania's domestic agricultural supply is insufficient in a range of products; annual instability for domestic agricultural supply; Romania's competitiveness in many agricultural products is problematic, and the integration into the European single market has amplified these problems; low level of processing the agricultural raw materials and of value added; low income and income gaps between the residence areas resulting in food insecurity; existing problems in rural areas, mainly with weak infrastruc-*

ture; poor food consumption in terms of quality. Then, we defined three main strategic directions for food security and safety in Romania, in the next two decades, trying to identify those areas on which Romania should focus its efforts to reach performance convergent with the developed countries of the EU. The proposed scenarios show the ways in which we see to achieve the identified targets.

Keywords: agriculture, strategy, Horizon 2035, Romania.

Introduction

Food security can be evaluated at different levels, yet most references are made at the macro-economic level (world, regional or national) and the micro-economic level, i.e. at household and individual level. Depending on the level of reference, the focus is laid on one or several out of the four food security dimensions, namely: food availability, supply stability, economic access and utilisation of food, represented by the individuals' desire to eat healthy food. In the case of using the food security concept at world or national level, the focus is laid on the capacity of countries to provide a sufficient agricultural supply so as to meet the population's food and nutrition needs (Pinstrup, 2009). The availability of food does not necessarily ensure access to food, as the problems linked to income distribution at society level can affect food security at the household level.

In this context, a first objective of this paper, which is based on certain results of Project 5 'Food Security and Safety' elaborated by the Institute of Agricultural Economics under the Romanian Academy Programme 'Romania's Development Strategy for the Next 20 years', was to evaluate the Romania population's food and nutrition security situation and to identify its main determinants and vulnerabilities. In the next sections, on the basis of plausible scenarios on the evolution of the general economic situation, as well as on the evolution of the Romanian agri-food sector, the necessary benchmarks are defined, on the basis of which the vision on food security and safety towards 2035 was developed.

The agri-food sector represents an important element for food security, as it is responsible for domestic food availability and supply stability. In a situation when it can meet these requirements only partially, due to insufficient agricultural resources or insufficient development, countries can import foodstuffs, yet this possibility can be limited by their available financial resources for imports. The reliance on massive food imports represents vulnerability, mainly in the current context of increased volatility of world agricultural prices. However, at the same time, food security is only partially conditioned by the existence of sufficient agricultural supply. Most often, the problems and vulnerabilities appear at micro-economic level, where the access to food is practically limited by the low purchasing power, by the lack of incomes, by poverty in general. That is why an essential determinant of a country's food security is represented

by its general sustainable development level, on which the household incomes, the population welfare and the physical and economic access to food ultimately depend. That is why in the approach to the vision on food security and safety at the 2035 horizon, we took into consideration the need for the country's general socio-economic development in parallel with the need for the development of the agri-food sector and rural areas, on the other.

Methodology

Our approach focuses on issues related to the agricultural sector's contribution to ensure food security for the population, as well as on aspects related to the access to food, to the food demand determinants and to certain elements regarding the population's nutritional status. The methods used in our analysis were from the class of qualitative methods (synthesis of literature, SWOT analysis, defining the scenarios and the vision), quantitative methods (extrapolation of trends) and semi-quantitative methods (Delphi technique).

On the basis of specialty literature on food security and safety, a diagnosis analysis of the agriculture and food situation in Romania was made, which covers the following thematic: agricultural land (including soil resources, soil quality conservation, water resources and climate change effects), economic performance of agricultural holdings, evolution of crop and animal production in the period 1990-2013/2014 and food security (focus on population's access to food).

For the SWOT analysis, a mix of indicators was used, which also included the indicators used by national and international organisations for the evaluation of the population's food and nutrition status in different regions of the world. The data sources refer to indicators and studies elaborated by FAO, OECD, IFPRI, Eurostat, EUI, Defra, MS and Romanian National Institute of Statistics (INS).

The formalisation of the vision on the future food security in Romania at the 2035 horizon was based on the quantification of the convergence potential of food security indicators from Romania with the developed countries from the EU, taking France and sometimes Poland as references.

By using the trend extrapolation method, we estimated the evolution of the food consumption expenditure share in total consumption expenditures, together with the evolution of cereals and meat consumption per capita. These variables were calculated under two economic growth scenarios. The first presupposes a moderate economic growth rate of 2 per cent, which is equal to the average economic growth rate in the investigated period. The second is more optimistic, because a 4 per cent economic growth rate is taken into consideration. These two economic growth rates are applied to the GDP value per capita expressed in PPS (purchasing power standard), thus obtaining an evolution of this in the forecast interval.

For calculating the evolution of the share of consumption expenditures in total expenditures we used 'Household Budget Survey', a database with information at household level, in 2012. A regression was estimated of the form:

$$w_i = a_1 + a_2 \cdot y_i + u_i$$

where: w_i is the share of food expenditures in total expenditures for each household;

a_1 and a_2 are coefficients estimated by the least square method;

y_i is the household income;

u_i is the regression error.

By using the regression equation, more exactly the a_1 and a_2 coefficients, we calculated the share of food expenditures for the given incomes from the two scenarios.

For calculating food consumption, we used information from the food balance sheets, supplied by Faostat. This database offers information on the food availabilities per capita for the main food products in different countries.

Results

SWOT analysis

In this paper, the analysis of strengths and weaknesses is structured by the four dimensions of food security, namely: A. Agricultural production availability, B. Access to food, C. Supply stability and D. Food safety and quality (Table 1).

Table 1. SWOT analysis

Strengths	Weaknesses
<i>A. Agricultural and food production availability</i>	
1. Romania is an important agricultural producer, with significant agricultural resources (crop production: arable land; animal production: pastures and hayfields). 2. For certain groups of food products, domestic production could cover the population's consumption needs (and positive trends for poultry, mutton and goat meat). 3. The food and beverages industry is the second largest in Central and Eastern Europe, after Poland, and significant investments were made in this sector in the last decade. 4. The food retail sector has significantly developed, with growth rates among the highest in the region. 5. In calorie terms, the food availability per person exceeds the average food consumption requirement per capita recommended by the Ministry of Health.	1. Weak performing agri-food sector; there are significant productivity gaps between Romania and the developed countries, which will only be gradually removed. 2. The extremely fragmented agrarian structure and the large number of farms make it difficult for the agricultural products to cross the chains, mainly in the vegetables, fruit and dairy products sectors. The absence of producer associations makes this situation even more difficult. 3. Domestic agricultural production cannot cover the population's consumption needs, on a systematic basis, in certain important groups of foodstuffs (meat, milk, fruit, vegetables and fish). 4. The share of low-value calories coming from cereals, potatoes and edible roots is much higher compared to other EU countries, yet decreasing.

	<p>5. The daily availability of animal protein, expressed in grammes/capita/day is lower than in other European countries.</p> <p>6. The food production value per capita is lower, which also means that the food supply per capita is lower.</p>
B. Access to food	
<p>1. The population's real incomes significantly increased in the economic growth period (2001-2008).</p> <p>2. The relative prices of food, at purchasing power parity (PPS), are lower compared to the European average, yet they have increased much faster in recent years (e.g. being higher than in Poland in 2012).</p> <p>3. Food consumption increased in the economic growth period, mainly in the products with a higher nutritional value.</p> <p>4. In the period 2001-2009 food consumption in the products with lower nutritional value, i.e. in potatoes, edible roots and even in certain cereals, decreased.</p>	<p>1. GDP per capita expressed at PPS is very low, below the EU average (in the penultimate place, above Bulgaria).</p> <p>2. There are big territorial disparities in terms of GDP per capita at PPS, and these increased in the post- EU accession period.</p> <p>3. The share of food consumption expenditures in total consumption expenditures is extremely high; it exceeds 65 per cent for the poor population (first deciles).</p> <p>5. The poverty rate is very high, mainly in the rural areas.</p> <p>6. The road network density per 100 km² is lower than in the compared countries and has declined in recent years.</p>
C. Supply stability	
<p>1. The consumer prices of food are relatively stable, their volatility being comparable to that from France and Poland.</p> <p>2. The variability of available food supply per capita, expressed in kcal (measured by the standard deviation from the trend of per capita calorie availability in the last five years), is low.</p> <p>3. In the last decade, warehouses were built for grain storage on the farm, with investments that were funded through European programmes.</p>	<p>1. Crop production is extremely volatile, mainly in the case of cereals.</p> <p>2. The human consumption dependency on imports is high in most years in soybeans, sugar, meat, fish and fruit, and even in cereals (wheat) in certain years.</p> <p>3. The share of effectively irrigated agricultural land has continuously decreased in the last 20 years.</p> <p>4. The value of food imports in total exported commodities is higher compared to the other EU member states, and this can bring to discussion the problem of financial availabilities for agricultural imports.</p> <p>5. Food production variability per capita, expressed in international dollars at PPS, is higher compared to other countries.</p> <p>6 The level of public expenditures for research and development is very low.</p> <p>7. Farmers' access to credits is low, which limits the possibility of funding certain production infrastructure elements (for instance, local solutions for irrigation) or production technologies that could attenuate the effect of weather excesses.</p>

D. Food safety and quality	
<p>1. The phytosanitary and zoo-veterinary standards in conformity with the EU legislation were implemented both in the agricultural production sector and in the agro-processing sector.</p> <p>2. The Romanian population's dietary diversity increased with the increase of incomes.</p>	<p>1. The percentage of population with access to improved drinking water sources is below the European standards.</p> <p>2. The percentage of population without access to sanitary facilities is below the European average.</p> <p>3. The percentage of child mortality as a result of food problems varied in the period 1990-2002, from 4.3 per cent to 3.3 per cent of all children under 5 years old.</p> <p>4. There are a significant share of stunted children under 5 years due to poor nutrition.</p> <p>5. The share of underweight children under 5 years old is relatively high for a EU country.</p>
Opportunities	Threats
<p>1. It is expected that the poverty level and implicitly the food insecurity risk will decrease with the increase of incomes.</p> <p>2. The domestic food demand is growing for the superior products from the nutritional point of view, such as fruit, meat, fish and dairy products, with the increase of incomes.</p> <p>3. Food demand is very elastic, which means that it has a significant growth potential, in the conditions of growing incomes.</p> <p>4. Income growth will also change the population's consumption preferences, with an increased demand for quality, healthy, ecological products.</p> <p>5. The foreign demand for food is on the rise, e.g. for meat in the Asia-Pacific area, which will ensure export markets for Romanian products in the future.</p> <p>6. In the medium term, there is a stability and predictability in relation to the agricultural policy in Romania, as the Common Agricultural Policy (CAP) measures for the period 2014-2020 have already been adopted.</p> <p>7. The continuation of EU funding through regional development funds and from other structural funds will improve Romania's transport infrastructure, making it more attractive for foreign investments.</p> <p>8. Romania's geographical position may allow a commercial hub status between the emergent countries from the Near East and the EU, with the economic benefits arising from that status.</p>	<p>1. There is the risk of widening gaps with regard to the population's incomes across regions and by residence areas and of a deepening of social polarisation in the next period.</p> <p>2. There are uncertainties in relation to the future evolution of the CAP by 2035 and to agriculture funding from the EU budget.</p> <p>3. There are important agricultural production risks related to climate factors and depletion of certain natural resources, like the reserves of soil substances and the water reserves.</p> <p>4. The risk related to regional political crises can become important, and this might stop foreign investment and financial flows, putting into danger the future economic growth of the country.</p> <p>5. The demographic risk related to the diminution of the country's population and of the young and active population in particular may put pressure on the country's future development and, more concretely, on the economic sectors where capital productivity is lower (such as agriculture), as the labour force will migrate to the sectors where it will be better remunerated.</p> <p>6. The disease risk can affect the livestock herds and the economic performance of the livestock sector, as well as the exports. At the same time, the crop diseases can affect yields and economic results in crop production.</p>

Source: own compilation

Vision

The vision on the population's food security in Romania was developed starting from the scope of this concept, which was gradually extended, from the initial condition of the existence of sufficient food for the entire population of the country, towards more complex approaches related to the population's economic access to food, to supply stability, food quality and nutrition security. As such, *the vision on ensuring food security for the population in the next 20 years implies not only a better functioning of the agricultural and agro-processing sector; but also sustainable development and economic growth on the long run, in parallel with environment preservation and conservation, as a guarantee to the preservation of the soil, water and air resources, in the absence of which not only food security and safety are threatened, but also people's life itself.*

The design of this vision started from the hypothesis that, in order to have a credible process of convergence with the developed countries of the EU we need sustained economic growth, coupled with a consistent investment effort, which should raise Romania's agriculture productivity and competitiveness to higher levels.

The objectives promoted by us under this vision target the availability and stability of agricultural and food supply, on one hand, as well as objectives related to the increase of the living standard and of the population's economic access to food, on the other hand:

- increase of Romanian agriculture's role as a supplier of food security, by increasing the coverage of food consumption needs from domestic production, by domestic agricultural supply stabilisation (mainly through irrigation infrastructure support measures as well as other measures to combat climate change and its impacts) and by increasing agricultural exports and acquiring the food security supplier status at regional and European level;
- improving the population's food access and of food quality through the increase of the population's purchasing power, by narrowing the gaps in relation to the economic access to food of the different population categories and dietary quality improvement through the increase of food protein intake and of dietary diversity;
- rural development and raising the educational level of the population employed in agriculture, premises for the food and nutrition safety improvement, by solving the problem of technical and transport infrastructure in the rural communities until 2035 and by raising young farmers' educational and training levels.

Increasing the coverage of food consumption needs by domestic production

Agricultural production self-sufficiency, defined as the proportion of domestic consumption covered by domestic production, is considered as the main guarantor of a country's food security. This approach is relevant for Romania from the perspective of the natural resources this country has, as well as by the comparisons in time (with the situations from the relatively recent past) and space (with EU member states with similar agricultural potential). As a result of price increases on the global markets of agricultural commodities, from 2007-2008, the concerns for food security were found among the consultation themes of 2010 on the CAP reform, while the importance attached to self-sufficiency by the officials responsible for agricultural policies has increased in recent times, at both European and national level. Self-sufficiency in certain important agricultural products in the EU featured stability in the last decade (Matthews, 2014), most staples being self-sufficient in 2013: wheat (126.1 per cent), cheeses (107.9 per cent, upward trend), butter (104.5 per cent, downward trend), skimmed milk powder (158.2 per cent, upward trend) and whole milk powder (213.5 per cent), pork (111.0 per cent) and poultry meat (104.2 per cent). The products for which the consumption at EU level is not covered by production are the following: maize (88.6 per cent), rice (64.3 per cent), sugar (88.6 per cent, downward trend), beef (99.6 per cent, upward trend) and sheep and goat meat (86.1 per cent, upward trend).

In Romania's case, the coverage of food consumption needs from domestic production is a priority objective for meat, as a result of the alarming low self-sufficiency rate in pork (72.6 per cent in 2013). For the other types of meat, self-sufficiency was not reached either in 2013. That is why the vision proposed had in view reaching a self-sufficiency rate in meat (per total) of 100 per cent by 2035. The improvement of self-sufficiency in fruit and vegetables was added to this potential target, as these products are considered important from the perspective of food consumption pattern evolution in Romania, in the sense of increasing the share of fruit and vegetables in the population's diet. In this respect, the targets proposed for total production can ensure self-sufficiency in meat and meat preparations at the 2035 horizon, mainly on the basis of the sustained growth of poultry meat production and re-launching the pork production. Through the contribution of these two sectors, total meat production is expected to increase by 26 per cent in the medium term and by 41 per cent in the long term, thus ensuring average yearly meat consumption per capita of 64.4 kg in the medium term (2025) and 69.3 kg in the long term (2035).

In vegetables, the self-sufficiency level is expected to reach almost 100 per cent in the medium and long terms, as a result of the increase of the areas under greenhouses and plastic tunnels and of the increase of yields per hectare, on the basis of selected seeds with high productive potential, as well as of the correct application of technologies, including the procurement of equipment, logistics, new storage systems. In addition, production and price volatility due

to adverse climate evolutions might decrease. Corroborated with the increase in the number of producer groups and organisations, the number of warehouses could also increase and the storage capacity could reach 166.8 thousand tonnes in 2018. This will make it possible to better plan the production, avoiding the surplus production situations in certain species of vegetables or the lack or insufficient cultivation of other vegetables, which is a relatively frequent situation at present.

For fruit, re-plantations are envisaged, which will improve self-sufficiency in the medium and long terms; yet the imports of fruit will continue to be important in the population's consumption, mainly out of season (citrus, other exotic fruit). It is expected that the re-plantations will receive financial support under the National Rural Development Plan (PNDR), but the high co-financing rate asked from farmers may become a restrictive factor in the access to funds.

Romania – net exporter of agri-food products

From the vision on agriculture as food security supplier, we shall next analyse the context in which Romania could regain the status of agri-food exporter and food security supplier at regional and European level. In formulating the work hypotheses, we must also take into account the main EU perspectives on the world market at the 2024 horizon, namely: the EU will remain a net exporter of meat (pork and poultry), dairy products (cheese, milk powder) and wheat; but will continue to have trade deficits in maize and oilseeds (soybean) and soybean meal.

For Romania, the statistical indicators for the period 2007-2014 were calculated (average yearly growth rate and annual fixed base and chain indices). These were correlated with the trends supplied by the information from the balance sheets, as well as with the trends estimated by the members of the team who investigated the most important products.

An important target is re-conquering the domestic market, so that for the main products with problems (meat, vegetables, fruit), domestic production can supply the largest part of the production sold in Romania (mainly in urban retail – supermarkets and hypermarkets).

At the 2035 horizon, we expect that the value of exports will double compared to 2013, considering the production forecasts and the self-sufficiency targets for the main products (live animals, meat, vegetables, fruit and cereals).

The import growth rates will be much lower (estimated at about 1.3 per cent per year, compared to almost 2.4 per cent per year in exports), so that by 2035 the imports will be about 32 per cent higher than in 2013. The increase of imports of very high quality processed products is envisaged (with high value), as well as of breeding animals of high genetic value. As a result, we estimate a positive trade balance, as well as coverage of imports by exports of over

125 per cent, after 2020. The necessary conditions for the increase of exports are the rehabilitation of domestic agri-food commodity chains, increase of the population's food consumption needs coverage by the domestic production, supply concentration, improving and maintaining product quality.

Table 2. Targets related to the value of trade with the analysed products (EUR million)

Specification	Reference value (2013)	Short term (2018)	Medium term (2025)	Long term (2035)
<i>Exports</i>				
Live animals	314	358	400	421
Meat	226	232	264	358
Vegetables	80	99	132	200
Fruit	79	94	119	168
Cereals	1983	2162	2634	3012
<i>Imports</i>				
Live animals	164	208	176	130
Meat	487	448	352	287
Vegetables	186	149	109	69
Fruit	294	274	247	214
Cereals	327	327	327	327

Source: authors' estimates.

Increasing the population's access to food

The population's food access represents a main condition for the population's food security. This depends in the first place on the household incomes and the food prices. In the countries with lower development level, food access can also depend largely on the subsistence production of the small peasant household farms and in this case their food security is conditioned by the agricultural land and animals into ownership. Subsistence economy and self-consumption still play an important role in ensuring food security for the population in Romania¹, mainly for the rural households, yet this modality to ensure the necessary food resources may lose its importance in the future, with the development of the country and mainly with the modernisation of rural areas.

As Romania is one of the EU countries with medium-low level of incomes per capita, it is facing certain vulnerabilities referring to the food security of certain population groups, under the background of poverty and social exclusion. The indicator that most synthetically reflects this situation is the share of food consumption expenditures in total consumption expenditures, which reached 44.9 per cent in 2013, one of the highest shares in the EU. However, this share was down from 55.9 per cent in 2001, hence by 11 per cent in 15 years.

¹ According to the Household Budget Survey, 2011, conducted by the National Institute of Statistics (INS) from Romania, more than half of the food consumption on the rural households comes from own-produced food. The level of self-consumption in total food consumption is 56 per cent in milk, 53 per cent in cheese, 85 per cent in eggs, 50 per cent in fresh meat, 60 per cent in vegetables, 45 per cent in fruit.

In the medium term, with the constant growth of incomes, the food demand becomes inelastic, in the sense that it continues its growth but it slows down its growth rate; in the long term, a saturation of demand growth will be reached for most products, and the demand will even decrease for certain products, under the background of diet modification and increase of concerns for healthy food. These evolutions, i.e. demand saturation and consumption decrease in certain products (such as meat), are currently taking place in certain developed European countries, due to the concerns for healthy food, change of demographic structures by the increase of the share of elderly population, changes in the lifestyle that presuppose a less intense physical activity. For example, in France, food consumption expenditures were down from 20 per cent in 1960 to 14 per cent in 2001, hence by 6 per cent in 40 years. However, in the same period, the population's food behaviour changed, due to the increased focus on health problems. People gradually gave up consuming traditional products rich in sugar and fat, and the red meat consumption has decreased since 1980. The consumption of poultry meat and ready-prepared food has increased instead (Monceau et al., 2002).

We presuppose that similar evolutions of food consumption will also take place in Romania, with the increase of population's incomes and purchasing power. As regards the growth of population's incomes, we started from the hypothesis of a positive growth trend of GDP per capita, expressed at purchasing power parity, which should get the population's purchasing power in Romania closer to the average EU-28 level in 2025 and to the current level of France in the long term, in 2035.

Taking into consideration the fact that the long-term trends that we have consulted (EC, 2015) indicate an economic growth of 2.3-2.4 per cent for Romania in the period 2014-2025 and a slowing down of growth rate from 1.6 per cent-1.7 per cent in the period 2025-2030, we considered it reasonable to presuppose that GDP per capita expressed at purchasing power parity will increase by 4 per cent on average annually in the period 2015-2025 and by 2 per cent annually in the period 2026-2035. Starting from these hypotheses and using certain regression equations based on Engel's curbs, we estimated the values of the share of food consumption expenditures, in the medium and long terms (Table 3).

The share of self-consumption expenditures is decreasing very slowly Romania's, although we presupposed a significant upward trend of GDP per capita at PPS (up to EUR 27,500 per capita at purchasing power parity, by 2035). This because for estimating the parameters of regression equations we used historical data (2000-2013), when the dynamics of this coefficient were affected by the very high income disparities, both across regions and by residence areas. Although incomes increased on average, the indicator referring to the share of food consumption expenditures features great inertia due to the rising disparities in relation to the level of incomes and the high share of poor and very poor population. We can presuppose that this indicator will reverse its trend in the future if we can reduce the income gaps and social polarisation.

Table 3. Target indicators of the increase of population's access to food

Specification	UM	Reference value (2013)	Short term (2018)	Medium term (2025)	Long term (2035)
Share of food consumption expenditures in total consumption expenditures	%	44.9	43.5 - 42.6	39.2 - 37.1	35.8 - 32.9
Meat consumption per capita – total carcass equivalent, of which:	kg/annum	57.4	60.5	64.4	69.3
-pork	kg/annum	29.02	29.58	31.20	32.64
-poultry	kg/annum	17.53	19.36	20.78	22.74
-beef	kg/annum	5.1	5.5	5.9	6.5
Vegetables consumption	kg/annum	152	167	184	187
Fruit consumption	kg/annum	73.7	79.3	86.0	89.3

Source: authors' estimates.

Rural development and the educational level of the population employed in agriculture

Table 4. Targets for technical and transport infrastructure in the rural communities

Specification	Reference value	Short term (2018)	Medium term (2025)	Long term (2035)
Share of modernised rural roads	9.67 (2014)	20	40	80
Share of communes with water pipe networks	71.65 (2013)	75	80	90
Share of communes with sewerage networks	23.49 (2013)	30	50	75

Source: authors' estimates.

The poor state of technical infrastructure is one of the most important factors which restricts the development of the rural areas in Romania. Strategic objectives, by 2035 are similar with Romania's territorial development strategy in 2035: i) providing a functional integration of rural areas in the national territory by supporting interconnection of transport networks; ii) increasing the quality of life in rural areas by developing the technical infrastructure in order to ensure quality, attractive and inclusive rural areas. The targets were divided into three categories: short-term (2018), medium-term (2025) and long term (2035) (Table 4).

Targets can be achieved through more financial support from different policy instruments, mainly PNDR and Operational Programmes (small and large infrastructure respectively).

In Romanian rural areas, the younger generation is becoming less and less concerned with access to secondary and higher education and specialised training of managers in agriculture is weak. The strategic objective proposed can be operationalised through two specific objectives: i) improving the education and training of young people in rural areas to improve access and their parti-

icipation in the labour market designed to ensure a satisfactory level of incomes and thereby access a nutritionally balanced diet; ii) professionalisation of agriculture in order to increase the economic performance of farms and agricultural product quality for end users. The targets are summarised in Table 5.

Table 5. Targets for increasing agricultural education and training specialised in rural Romania

Specification	Reference value	Short term (2018)	Medium term (2025)	Long term (2035)
Share of young people in sparsely populated areas (15-17 years) who are not enrolled in education or training system, or employees	8.5 (2014)	8	5	2
Rate of early school leaving in sparsely populated areas (18-24)	29.2 (2013)	26	18	11
Share of farms with managers with agricultural training	3.6 (2013)	7	35	60

Source: authors' estimates.

We note that targets for increasing the educational level of the younger generation and rural training agricultural specialists have been determined taking into account the current realities of rural Romania compared with realities of rural and agriculture from France.

Resources

In order to reach the targets on the self-supply in the important products from Romania's food security perspective, i.e. meat, vegetables and fruit (Table 6), we estimated the necessary public funds for investment support in the respective agricultural production sectors.

Table 6. Self-supply targets in the important agricultural products for food security (%)

Product	Baseline situation (2013)	Short term (2018)	Medium term (2025)	Long term (2035)
Pork	72	72	93	100
Poultry meat	94.3	97	100	109
Beef	91.2	93	96	100
Vegetables	91	93	95	100
Fruit	78.6	79	83	86

Sources: INS (2013) and authors' estimates.

The necessary financial resources from public funds for the support to investments in the priority areas for food security and safety in the period can be provided in the period 2016-2020 from the PNDR funds and through special budgetary allocations (for the main irrigation infrastructure or for the rural infrastructure), according to the estimates presented in Table 7.

Table 7. Estimating the support from public funds necessary for funding the investments in the priority areas for food security and safety (EUR million)

Priority sector	Available 2016-2020	Necessary 2016-2020	Necessary 2021-2025	Necessary 2026-2035	Observations
Pork	823 (SM 4.1)	150	150	300	Beneficiaries will ensure co-financing from own or attracted sources
Poultry meat	373 (SM 4.2)	171	172	345	
Beef	400 (SM 6.1)	85	130	235	
Vegetables	17 (SM 9.1)	188	196	208	
Fruit	25 (SM 16.4)	321	443	443	

Note: SM = sub-measure of PNDR 2014-2020

Source: authors' estimations.

The comparison between the available and necessary resources for the period 2016-2020 reveals the fact that from the food security perspective the main problem is not represented by the financial resources (in fact, the available funds were not spent under PNDR 2007-2013 either), but rather by the set of measures to boost investments (and production implicitly) in the priority sectors, i.e. livestock, vegetables and fruit. The credit guarantee funds will have an important contribution to the implementation of measures to support private investments, as proved for PNDR 2007-2013 by the activity of Rural Credit Guarantee Fund (RCGF).

Scenarios

This report estimates started from the hypothesis of continuation of the generous EU finance received by the agricultural sector and rural areas of Romania. We mention that this funding started even from the pre-accession period, under the SAPARD programme, and continued with the financial allocations received under the two CAP Pillars, from EAGF and EAFRD, under the financial programming 2007-2013 and 2014-2020. The agricultural sector was thus one of the main beneficiaries of Romania's EU membership, the European money ensuring the stability and predictability of farmers' finance. At the same time, we consider that a prospective approach, on a long-time horizon, implies certain uncertainties, in the first place related to the political and economic evolutions outside Romania, both at European and world level. In this context, we cannot ignore the fact that *there are the risks that, under the pressure of eurosceptic currents, the common European project has little chance of fulfilment, putting into difficulty the agriculture and rural area modernisation process in Romania.*

The specificity of the food security and safety issue is given by the importance of EU finance, both for the support to agricultural investments (through the seven-year rural development programmes) and for the support of current farmers' incomes (through direct payments). Among the elements that would generate uncertainty one can also mention, as an extreme event with low probability, the dissolution of the EU (and disappearance of the CAP), as well as an event with higher probability, the gradual diminution of funds allocated to

CAP in the next budget planning periods under the pressure of states advocating the perspective ‘public money for public goods’ to the detriment of the perspective that relies on supply management and market regulation. Thus, three scenarios can be taken into consideration, which represent directions to investigate in this study: realistic, pessimistic and optimistic.

The realistic scenario has in view *CAP functioning in its present directions in the next 20 years*, with slowly decreasing financial allocations, with stronger convergence between Romania and the EU Old Member States, both in relation to the financial support level and to the level of average yields and labour productivity. The estimates of the necessary investment funds (public component for the priority sectors in food security and safety terms) from the present report were mainly based on elements of this scenario. The amounts of the entire budget of the Ministry of Agriculture and Rural Development (MADR) as well as those put at the disposal of Romania through the CAP (separately by its two Pillars) are given in Table 8.

Table 8. Estimating the public support to agriculture and rural development by main finance sources in the realistic scenario (EUR million per year)

	2015	2020	2025	2035
State budget (MADR)	1157	1270	1300	1500
CAP Pillar 1 (EAGF)	1072	1903	2000	2200
CAP Pillar 2 (EAFRD)	1519	1142	1000	900

Source: authors' estimates.

The pessimistic scenario takes into consideration the *hypothesis of continuation of EU functioning in the next 20 years, but it has in view a diminution of CAP funding through the re-allocation of finance to other areas* (environment conservation, poverty alleviation, retraining, environment conservation, professional reorientation, technological research, energy etc.). In this situation, the estimated finance for reaching this strategy targets should largely come from the national budget, which could lead to non-reaching certain objectives. Compared to the realistic scenario, the total sums (from national and EU funds) for the agricultural sector might decrease by EUR 300 million each year for the first post-2020 programming period (year 2025 from Table 9) and by EUR 700 million each year in the second programming period (2028-2034), situation extrapolated for the year 2035 as well.

Table 9. Estimating the public support for agriculture and rural development by the main funding sources in the pessimistic scenario (EUR million, annually)

	2015	2020	2025	2035
State budget (MADR)	1157	1270	1500	1700
CAP Pillar 1 (EAGF)	1072	1903	1700	1500
CAP Pillar 2 (EAFRD)	1519	1142	800	700

Source: authors' estimates.

The optimistic scenario presupposes that the importance of agriculture from the multiple perspectives of food security, economy, employment, environment, territoriality and resilience will be recognised at European level, which will result in the future CAP being structured around three main objectives²: *contribution to economic growth and job creation, response to the climate change challenges and ensuring the equilibrium in rural areas, strengthening the agricultural sector resilience and risk management*. In this case, Romania might be an important beneficiary of CAP funds, and the technical and economic performance of Romania's agriculture could be significantly improved over the long term. Such a favourable situation, transposed into figures (Table 10), would mean in terms of public finance an additional annual support to agriculture and rural development by EUR 300 million in the first programming period (corresponding to the year 2025) and by EUR 500 million in the second programming period (to which the year 2035 has been assimilated).

Table 10. Estimating the public support for agriculture and rural development by the main funding sources in the optimistic scenario (EUR million, annually)

	2015	2020	2025	2035
State budget (MADR)	1157	1270	1300	1500
CAP Pillar 1 (EAGF)	1072	1903	2100	2400
CAP Pillar 2 (EAFRD)	1519	1142	1200	1000

Source: authors' estimates.

Table 11. Agriculture and rural development expenditures, from national and EU funds, in the realistic scenario (% of GDP)

	2015	2020	2025	2035
State budget (MADR)	0.72	0.61	0.50	0.41
CAP Pillar 1 (EAGF)	0.67	0.92	0.77	0.61
CAP Pillar 2 (EAFRD)	0.95	0.55	0.38	0.25

Source: authors' estimates.

The agriculture and rural development sector has a special situation among the national economy sectors, due to the CAP that aligns Romania to the practices of Old Member States (even though not at the same level of subsidies so far). However, what is not granted under the direct payments form is offset to some extent by the support to rural development. That is why it is expected that the necessary investments for the post-2020 period will continue to be ensured from EU funds. At the same time, the national component will be increasingly important for investments in infrastructure. Having in view the debates that are still at an early stage referring to the future CAP and taking as reference the position of France, whose officials consider that a strong European agricultural policy is indispensable to the EU, we estimated the level of public expenditures for agriculture and rural development at values comparable to the current ones, both as regards MADR budget contri-

² ***. (2016): A reformed CAP for competitive, sustainable and resilient agriculture. French contribution to the 29/31 May 2016, Informal Council on the post 2020 CAP.

bution and that of the two CAP Pillars (values corresponding to the realistic scenario); these amounts are expressed in Table 11 as share of GDP, for the horizons 2020-2025-2035.

While the funds granted to Romania under CAP Pillar 1 after 2020, in absolute value, were estimated to increase, those dedicated to rural development (CAP Pillar 2) were estimated to decline, as absolute value (as a result of solving certain problems of agriculture and rural area). The amounts allocated from the state budget were estimated to increase slowly, in absolute value, which will lead to the diminution of agricultural expenditure share in GDP from 0.72 per cent in 2015 to 0.41 per cent in 2035. By comparison, 0.4 per cent represents the share of agriculture, forestry, fisheries and hunting expenditures in GDP in France, in the period 2009-2011 (in the last years this share was down to 0.2 per cent). In Romania, after the diminution in share of these expenditures from 1.2 per cent of GDP in the period 2009-2011 to 0.9 per cent in 2012-2014, the gradual diminution to 0.4 per cent by 2035 means that the budget of agriculture will increase more slowly than GDP increase.

Conclusions

The estimates presented in this study show that the support to investments through EU funds will create the conditions for the increase of farmers' incomes and change of the quality of life in rural areas. The concrete approaches have to be identified that enable the access of all farms (small, medium and large) to funding for investments because, beyond all the farm performance indicators, the following objectives remain essential for the food security purpose: poverty alleviation at national level, social polarisation diminution and rural population's welfare increase. The main conclusions of the study are as follows:

- A positive trade balance is estimated, as well as a degree of coverage of imports by exports of more than 125 per cent, after 2020.
- The share of food consumption expenditures will decrease very slowly, from about 45 per cent at present to about 33-35 per cent in 2035, in the conditions in which the population's incomes have a positive trend, and GDP per capita at purchasing power parity will increase to a level that gets the population's purchasing power in Romania close to the EU-28 average by 2025 and to the present level of France in the long term, by 2035.
- Financial resources are needed to reach the proposed targets, and these can be ensured from public funds for support to investments in the priority areas for food security and safety in the period 2016-2020, namely from PNDR funds and through special budgetary allocations. These will add to the structural funds.
- The share of agricultural, forestry, hunting and fisheries expenditures in GDP is estimated to reach the level of France (of the period 2009-2011) in 2035, which reveals a 25-year gap between the two countries.

- Any of the three investigated scenarios is possible, noting that some other factors of influence may occur in the long term, which could not be considered in our analysis.

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