

PROJECT 5. FOOD SECURITY AND SAFETY

Project 5. Food security and safety analyzes the evolution of the economic and social sectors involved in ensuring food security for Romania's population in the next 20 years. Food security was approached as a multi-dimensional concept that has in view both the need to ensure a sufficient agricultural supply and the population's economic access to food, stability of food supply and utilization at individual level. Agriculture is mainly responsible for food availability, having to ensure a sufficient food supply to meet the population's food and nutritional needs, while the access to food depends on the general situation of the economy, on which the food purchasing power of each household depends, through the population's income level.

In this context, a first activity of this project consisted in the **assessment of the state of food and nutrition** of the Romanian population and the identification of its main determinants. The expectations and forecasts for food security and agriculture worldwide reveal a slowing down of the general growth rate of agricultural production on the medium and long term, while the agricultural production growth will target the developing countries in the future. Food demand will continue to increase in the years to come, as the world's population will grow significantly, and the climate changes will put increasingly strong pressure on water and soil resources. In the future, food security and safety will depend on ensuring the necessary water and energy resources, while the scientific research will contribute to finding new sources and means that would lead to sustainable meeting of food needs. In these circumstances, food security represents a priority of the agricultural policies, both at European level and nationwide.

As a reference for positioning the Romanian agriculture in the European context, at the horizon of 2038, the level of France was considered, as agricultural country with complex productive potential and a production mix quite similar to that of Romania. The value of agricultural production per hectare represents 44% of the value of France (as 2011-2015 average); hence in order to bridge up the gap it is necessary to double the agricultural production value by the year 2038.

The analysis of food security and safety situation in Romania revealed several *vulnerabilities*: insufficient domestic agricultural supply in a wide range of products, among which long term deficits exist in meat, vegetables, fruit, sugar and fish; instability of domestic agricultural supply, mainly in the case of crop production, in cereals in particular, which indirectly impacts livestock production; farm gate prices for certain agricultural products, among which pigmeat, potatoes, certain vegetables and fruits (apples), continue to be higher than the prices in the neighbouring Central and East-European countries; the low level of population's incomes and the existing income gaps across regions and by residence areas are sources of food insecurity; the inadequate road and healthcare infrastructure, mainly in the rural areas, generates food and nutritional insecurity risks; the unbalanced diet from qualitative point of view, the high share of calories from cereals and potatoes, as well as the low intake of animal protein are generating nutritional risks; there are categories of population at high food and nutritional risk, among which the children from the countryside and the roma communities. The need to counteract these vulnerabilities guided us in our approach to select the priorities to improve the food security for Romania's population on the medium and long term.

- As **agricultural production is the main and most reliable source for ensuring the consumption availability for the population** of a country, it was considered that the most important strategic direction of this approach is **increasing the Romanian agriculture role as food security supplier**, with the following objectives: *increased coverage of the population's food consumption needs from domestic production*, in the main products (cereals, vegetables, fruit, meat, processed foodstuffs); *domestic agricultural supply stabilization*, mainly through measures to support land

reclamation infrastructure improvement (focusing mainly on irrigations); ***acquiring the status of exporting country of agricultural products and food security supplier at regional and European level.***

- The second strategic direction is represented by **increasing the population's food access and improving the nutrition quality**, by *increasing the population's purchasing power, narrowing the gaps in relation to the access to food between different categories of households and improvement of the population's diet quality and of food diversity.*

- The third strategic direction refers to **rural development and raising the rural population's educational level, as premises for improving food and nutrition safety.** The targeted objectives are linked to the *development and modernization of road and healthcare infrastructure in rural localities*, of the school network, increasing the educational level of people working in the farming sector and *improving the qualification of farm heads.* For the previously mentioned strategic directions, targets were proposed for the 2020-2028-2038 horizons, starting from the baseline situation represented by the year 2015.

- For the strategic direction **increasing the role of Romania's agriculture** as food security supplier, within the objective linked to *increased coverage of population's food consumption needs from domestic production*, targets were established for self-sufficiency in foodstuffs with systematic deficits in the last decades, namely **meat** (for which the self-supply level would increase from 79% in 2015 to 99% in 2038), **vegetables** (from 88% in 2015 to 104% in 2038) and **fruit** (from 67% in 2015 to 86% in 2038). At the same time, **targets for cereal production** were specified, essential for the development of the livestock production sector.

For the objective targeting *cereal production stabilization*, targets were proposed for **reducing the volatility of agricultural production**, of crop production and of cereal, vegetable and fruit production respectively. The *rehabilitation and modernization of the irrigation system* is considered the main modality to reduce agricultural production volatility. The proposed targets for the agricultural areas served by modernized irrigation systems start from 400 thousand hectares in 2015, to 600 thousand hectares in 2020, 800 thousand hectares in 2028 and 950 thousand hectares in 2038, while for the effectively irrigated areas from 173 thousand hectares in 2015, to 400 thousand hectares in 2020, 600 thousand hectares in 2028 and 800 thousand hectares in 2038.

As regards **Romania's agricultural trade**, the targets proposed for the next 20 years refer to the agricultural exports and imports, as well as to import coverage by exports. The proposed targets for the agricultural trade balance have in view the transition from a net importer of agricultural products in most years to a net exporting country, which should take full advantage of its agricultural potential and geographical position opportunities, by developing the status of trade node between the emerging countries from the Near East and the European Union area.

- For the second strategic direction represented by the **increase of population's access to food and nutrition quality improvement**, targets are proposed for the *share of food consumption expenditures in total consumption expenditures*, considered as a key indicator that reflects the population's economic access to food. In Romania, this was 38.2% in the year 2015 (compared to 13.6% in France), while the proposed target was 27% in 2038. At the same time, for the *increase of nutrition quality*, targets were proposed for increasing the consumption of products that are considered to have high nutritional value, such as meat, vegetables, fruit, and for decreasing the consumption of starch-based products considered to have low nutritional value, such as cereals and potatoes. In this context, targets were specified for the consumption of different types of meat, cereals, vegetables and fruits.

- As regards the third strategic direction, **rural development and raising the rural population's educational level**, targets were proposed for the *improvement of rural infrastructure*, namely for the increase of the share of modernized communal roads, of the share of communes with

drinking water supply network and of communes with sewerage system. Rural infrastructure development is essential for the nutritional safety and health of rural residents. At the same time, this can decisively contribute to the revitalization of rural areas, by the consolidation of supply chains, including the delivery of agricultural products to processors, for the attraction of youth in the countryside and for the development of small business to ensure the sustainability of rural people's incomes. At the same time, ***farmers' education and training*** is essential for Romania's agriculture performance in the next decades. In this respect, targets were specified for training farmers, for the farm managers with full agricultural training and for farm managers with basic agricultural training.

The quantitative and qualitative assessment of the resources needed for the agricultural sector has taken into account the necessary human and financial resources for investments in irrigation and land improvement infrastructure, productive investments on farms, in warehousing, in chain organization, in agricultural research and rural infrastructure. The agricultural sector was severely under-funded during the transition period, and this is one of the causes why the Romanian agriculture productivity and competitiveness are much lower than the European average. As an effect of this gap, the value added per person with full-time employment in Romania's agricultural sector accounts for only 29% of the European average at present.

The assessment of ***human and financial resources*** needed to reach the proposed food security and safety targets focused on two main directions: improving the professional training of farm heads, on the one hand, and public support to investments in the agricultural sector and rural area, on the other hand. Under the hypothesis of the diminution of population employed in agriculture to about 15% by the year 2038, increasing the training level of farm heads in Romania to bring them to a situation comparable to that in Poland implies an estimated financial need of about 2 billion euro, both for the full professional training and for the basic training of farm heads. It was considered that the *professional training of farm heads* will take place simultaneously with the adjustment of agrarian structures, mainly through the diminution of the number of farms. It is expected that the improvement of the professional training of farm heads will have significant effects on labour productivity in agriculture, being also stimulated by the progress made in agricultural research. The estimates of the financial resources needed for the agricultural research tried to provide a picture of the budgetary effort necessary for the rehabilitation of the Romanian agricultural research in the next decades, starting from the current level of the structure of research funds allocation to the agricultural sciences. The amounts estimated as necessary to be allocated for agricultural research, i.e. about 700 million euro annually at the horizon of 2038, represent the transposition of national scientific research targets including both state and private funding.

The estimation of public funds for the ***support to investments in the agricultural production sectors*** relevant from food security perspective (meat, vegetables and fruit), as well as for the rehabilitation and modernization of the irrigation systems and basic rural infrastructure (roads and drinking water supply and sewerage networks) revealed the importance of European funds for agriculture and rural development. For each agricultural product, specific measures are needed, namely: the poultry farming sector represents the main vector for reaching self-sufficiency in meat by the year 2038, with technical performances comparable to the highly performing producers from the EU; in the pig farming sector, investments are necessary on the reproduction farms specialized in producing piglets with high genetic potential; beef can contribute to reaching the self-sufficiency target in the future, both by production increase and by improving its quality; the vegetable sector should surmount the difficulties related to low yields, to the insufficiently developed logistics system and to the low organizational level; the fruit tree sub-program, part of NRDP 2014-2020, can decisively contribute to correcting the fruit sector deficiencies. The comparison between the available resources and the necessary resources for the period 2016-2020 reveals that from food security perspective, the

main problem is not represented by the financial resources, but rather by the set of measures to stimulate investments in the priority sectors for food security, namely livestock, vegetables and fruit sectors. An important contribution to the implementation of measures to support private investments will come from the credit guarantee funds for farmers.

Although the starting point in the *rehabilitation and modernization of the irrigation systems* is quite delicate, due to the progressive degradation of the largest part of these systems in the last two decades, the necessary public funds for investments in the main and secondary irrigation infrastructure for the next 20 years is estimated at 1.4 billion euro for the main infrastructure (from the state budget) and about 1 billion euro for the secondary infrastructure (mainly from EU funds).

The investments for the *rural infrastructure modernization*, prioritarily oriented to the rural localities – economic and social growth poles, whose viability must be sustained, are estimated at about 1.5 billion euro for communal roads, drinking water supply and sewerage networks in the period 2016-2020, mainly from European funds. The complete solving of infrastructure problems in the rural area by the year 2038 needs significant finance, of about 15 billion euro, which can be mobilized from a mix of European and national programs.

At the end of the prospective approach, *short, medium and long term scenarios* were outlined, to which certain levels of the main performance indicators in agriculture and food security in Romania can be associated, in the effort to reach the levels from the developed countries of Europe, together with the harmonization of the proposed objectives to those of the current governmental strategies, on the short and medium term.

The three designed scenarios for the evolution of agriculture and food security in the next 20 years (*optimistic, realistic and pessimistic scenarios*), took into consideration a wide range of economic, social and demographic evolutions, and mainly the future Common Agricultural Policy, considered as stable and with increased funding under the optimistic scenario, with funding similar to the current level in the realistic scenario and suffering a drastic diminution of funding in the pessimistic scenario.

The strategic indicators to bridge up the gaps for key areas defining the food security and safety issue: share of food consumption expenditures in total consumption expenditures; labour productivity in agriculture (expressed in euro/annual work unit); financial allocations from European and national funds; value of agricultural production and intermediary consumption (euro/ha); fertilizer consumption (kg/ha) and effectively irrigated area; average cereal yield (kg/ha); total meat consumption (kg/capita/year); share of utilized agricultural area cultivated under organic farming system; agri-food trade balance and import coverage by exports; share of communes with drinking water supply network and of communes with sewerage system. (Annex, Tables 1-16)

An advanced gap recovery is quite difficult, due to the structural problems of Romania's agriculture in the first place, where the excessive fragmentation of farms is a hindrance to high productivity farming. The estimates indicate that the contribution of investments provided by the European funds will create the necessary conditions for increasing productivity, farmers' incomes and improvement of the quality of life in the rural areas.

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ANNEX

Table 1

Scenarios for the evolution of food consumption expenditures (foodstuffs and non-alcoholic beverages) in total consumption expenditures of households (%)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 35.0 | 24.0 | 17.0 |
| Realistic | 37.0 | 32.0 | 27.0 |
| Pessimistic | 38.0 | 35.0 | 32.0 |

Note: France = 13.6% (2013); Romania = 38.2% (2015)

Table 2

Scenarios for the evolution of labour productivity in agriculture (euro/annual work unit)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 6384 | 15115 | 35783 |
| Realistic | 6503 | 12540 | 19284 |
| Pessimistic | 5878 | 8306 | 10734 |

Note: France = 39199 euro/AWU (2015); Romania = 4930 euro/AWU (2015)

Table 3

Scenarios for the evolution of the level of annual allocations for direct payments, from the European Agricultural Guarantee Fund - EAGF (million euro)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 1903 | 2100 | 2600 |
| Realistic | 1850 | 2000 | 2400 |
| Pessimistic | 1800 | 1700 | 1300 |

Note: France = 7586 mil. euro (2015); Romania = 1428 mil. euro (2015)

Table 4

Scenarios for the evolution of the level of annual allocations for rural development, from the European Agricultural Fund for Rural Development – EAFRD (million euro)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 1142 | 1200 | 1000 |
| Realistic | 1100 | 1000 | 800 |
| Pessimistic | 1000 | 800 | 700 |

Note: France = 1408 mil.euro (2015); Romania = 1148 mil.euro (2015)

Table 5

Scenarios for the evolution of annual allocations from the state budget for MARD (million euro)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 1300 | 1200 | 1500 |
| Realistic | 1270 | 1300 | 1600 |
| Pessimistic | 1100 | 1500 | 1700 |

Note: France = 4363 mil.euro (2014); Romania = 1157 mil.euro (2015)

Table 6

Scenarios for the evolution of the unit value of agricultural output (euro/ha)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 1416 | 1938 | 2869 |
| Realistic | 1362 | 1793 | 2530 |
| Pessimistic | 1214 | 1302 | 1390 |

Note: France = 2639 mil.euro (2015); Romania = 1045 mil.euro (2015)

Table 7

Scenarios for the evolution of the unit value of intermediate consumption (euro/ha)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 806 | 1104 | 1634 |
| Realistic | 776 | 1021 | 1441 |
| Pessimistic | 630 | 685 | 724 |

Note: France = 1557 mil.euro (2015); Romania = 551 mil.euro (2015)

Table 8

Scenarios for the evolution of fertilizer consumption (kg/ha of arable land and land under permanent crops)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 84 | 105 | 130 |
| Realistic | 79 | 90 | 105 |
| Pessimistic | 75 | 80 | 86 |

Note: France = 130 kg/ha (2009-2013); Romania = 72 kg/ha (2010-2015)

Table 9

Scenarios for the evolution of effectively irrigated agricultural areas (thou. ha)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 430 | 950 | 1500 |
| Realistic | 400 | 660 | 800 |
| Pessimistic | 220 | 350 | 500 |

Note: France = 1580 thou. ha (2005-2007); Romania = 170 thou. ha (2010-2015)

Table 10

Scenarios for the evolution of cereal yields (kg/ha)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 4460 | 5840 | 7560 |
| Realistic | 4100 | 4950 | 6050 |
| Pessimistic | 3700 | 4070 | 4540 |

Note: France = 7561 kg/ha (2014); Romania = 4069 kg/ha (2014)

Table 11

Scenarios for the evolution of total meat consumption (kg/capita/year)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 70 | 80 | 85 |
| Realistic | 67 | 72 | 77 |
| Pessimistic | 65 | 67 | 70 |

Note: France = 85.5 kg/capita/year (2011); Romania = 63.4 kg/capita/year (2015)

Table 12

Scenarios for the evolution of the utilized agricultural area cultivated under organic farming system
(% of total utilized agricultural area)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 2.30 | 3.10 | 4.00 |
| Realistic | 2.12 | 2.60 | 3.20 |
| Pessimistic | 2.08 | 2.40 | 2.80 |

Note: France = 3.83% (2011-2015); Romania = 1.93% (2011-2015)

Table 13

Scenarios for the evolution of the agri-food trade balance (million euro)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 527 | 1755 | 2439 |
| Realistic | 130 | 597 | 1924 |
| Pessimistic | -169 | -245 | -354 |

Note: France = 13257 mil. euro; Poland= 5363 mil. euro; Romania = -118 mil. euro (2010-2015 averages)

Table 14

Scenarios for the evolution of import coverage by exports (%)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 109 | 128 | 131 |
| Realistic | 102 | 109 | 126 |
| Pessimistic | 97 | 96 | 95 |

Note: France = 130.7%; Poland = 142.8%; Romania = 97.5% (2010-2015 averages)

Table 15

Scenarios for the evolution of the share of communes with drinking water supply network (%)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 85 | 90 | 95 |
| Realistic | 78 | 85 | 90 |
| Pessimistic | 78 | 82 | 85 |

Table 16

Scenarios for the evolution of communes with sewerage system (%)

| <i>Scenarios</i> | <i>Horizon 2020</i> | <i>Horizon 2028</i> | <i>Horizon 2038</i> |
|------------------|---------------------|---------------------|---------------------|
| Optimistic | 35 | 45 | 75 |
| Realistic | 32 | 39 | 63 |
| Pessimistic | 32 | 35 | 40 |

Note: France =100%; Romania = 28.3% (2015)