Complex development alternatives in South-Muntenia region – prospective assessments

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COMPLEX DEVELOPMENT ALTERNATIVES IN SOUTH-MUNTENIA REGION –PROSPECTIVE ASSESSMENTS

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Abstract: *To raise the issue of the complex development of a zone where the agricultural production is the prevailing economic activity implies a certain difficulty, induced by the natural question: how can pluri-activity be generated in a predominantly mono-active rural area? Even if, at first sight, the issue could be considered relatively marginal, in reality, at least two essential "agents": agriculture, as such, and the remaining national economy have participated to the complex development of the rural area. Agriculture, because when it reaches performance, it becomes capable to generate surplus supply compared to the local consumption needs, available for re-distribution to other deficit areas or for processing. The national economy, because it generates alternative incomes for the surplus agricultural population through various non-agricultural activities developed in the rural area. Starting from the premise that regional development, in general, and rural development, in particular, takes place almost exclusively through local initiatives, we consider that by identifying certain production intensification opportunities in crops and livestock species that have favorable conditions in the counties from South-Muntenia region, we can shape the main pillars for the complex development at regional level.*
From the methodological point of view, the approach is based on public statistical information, using well-known statistical methods for processing the information, of comparison or structural type, the results being mainly presented under table form. The information support necessary for the development of the present approach was based on data supplied mainly by the National Institute of Statistics, through the Tempo-Online database.

Key words: *sustainable development, alternatives, criteria.*

JEL Classification: *R10, R11, R12*.

INTRODUCTION

In the context of financial support measures implemented through multiple national and Community programs, the identification of complex development alternatives has acquired increased importance at national and at local level in particular. In South-Muntenia region, agriculture is the main activity in the rural area; hence the conclusion that can be drawn is that it is on the economic revigoration and development of this branch that any zonal economic development strategy largely depends, targeting the improvement of the general situation of the local economy, having as final effect the diminution of economic and social discrepancies compared to other areas. The realism of this conclusion comes to be part of a more general feature of South-Muntenia region, i.e. the problems of this region derive from a too net divide between the industrial area, concentrated in certain counties, and the agricultural and rural area, covering almost the entire territory of the region.

In the context mentioned above, we consider that such an approach applicable at the level of a development region that is important in size in the Romanian economy can be considered as a first step for constructing alternative models in other areas as well.

MATERIALS AND METHODS

From the methodological point of view, the present approach is based on public information supplied by the national statistics through Tempo-Online database, covering the time horizon 1990-2015. Considering the quite limited information fund, which is in many cases outdated, we should specify that the current approach is based on constructing certain development alternatives at the level of the component counties of South-Muntenia region, the starting point being represented by the level of total productions for the main agricultural

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products. It should be made clear that this approach is part of a larger approach, i.e. the complex sustainable development of the rural area in South-Muntenia region.

RESULTS AND DISCUSSIONS

In order to identify regional development alternatives, it was necessary to take into consideration certain working hypotheses, among which we can mention the following:

a) Out of the agricultural products for which we have data on total productions in each of the seven counties, for the period 1990-2015, we selected the most representative six products, with a significant share in the population's consumption (wheat, rye, grain maize, sunflower, vegetables, cow and buffalo cow milk, meat total).

b) After determining the annual averages of total productions in the six selected products, for the period 1990-2015, we calculated the shares of each county in total region, three counties with the highest shares in each product in part to be selected afterwards.

c) The third working hypothesis consists in determining the annual modification rate of total productions in the six selected products, for the period 1990-2015, and three counties with the highest positive rates will be selected.

Referring to the second working hypothesis, the following average shares of counties in total region were determined, for the six selected agricultural products (Table no. 1).

Table no. 1. Share of counties in total region for the main crop and livestock products, 1990-2015 (%)[2]

	Rye	Wheat	Grain maize	Sunflower	Vegetables	Live weight of slaughter animals for consumption – tons total	Milk production (calves consumption included) – cow and buffalo cow milk – thou. hl
Argeş	23.3	7.8	9.0	4.9	10.9	12.5	24.6
Călăraşi	12.5	24.4	21.1	26.6	6.0	21.2	7.7
Dâmboviţa	14.4	5.7	11.3	2.4	31.5	14.9	17.6
Giurgiu	30.6	12.7	11.8	11.8	11.6	9.9	10.8
Ialomiţa	16.4	17.0	18.5	24.7	15.8	15.4	10.3
Prahova	20.5	5.9	11.6	3.6	9.7	13.7	14.0
Teleorman	62.7	26.5	16.6	26.0	14.5	12.5	15.1

Source: own calculations based on Tempo-Online data, NIS, 2017.

At the same time, the third working hypothesis presupposed the determination of the annual modification rates of total production, for the main agricultural products, in each county of South-Muntenia region (Table no. 2).

It is worth mentioning the presence of negative modification rates in certain selected products in most counties from the region South-Muntenia. However, 16 situations have been identified in which positive rates were noticed in one or other of the six analyzed products.

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[2] The first three shares for each product are written in red.

Table no. 2. Average annual modification rate of crop and livestock production, by main products, in the counties from South-Muntenia region, 1990-2015

	Rye	Wheat	Grain maize	Sunflower	Vegetables	Live weight of slaughter animals for human consumption – tons total	Milk production (calves consumption included) – cow and buffalo cow milk – thou. hl
Argeş	-5.5	1.2	0.3	3.1	1.7	-1.8	-0.8
Călăraşi	-6.7	-1.5	-0.1	1.7	1.12	-3.2	0.7
Dâmboviţa	5.1	2.4	2.0	1.8	-4.4	0.2	-1.9
Giurgiu	-0.3	-2.5	-0.4	1.7	6.2	-1.3	-0.2
Ialomiţa	-13.9	1.9	-0.9	4.2	1.1	-2.6	-1.7
Prahova	-3.0	2.7	1.4	3.4	2.0	-3.5	-3.1
Teleorman	-1.8	-0.6	0.7	6.1	-0.6	-0.1	0.003

Source: own calculations based on Tempo-Online data, NIS, 2017.

Correlating the results from the two previous tables, one can notice that the panel of counties with high shares in more than two products does not coincide with the panel of counties with high rates, in more than two products (Table no. 3).

Table no. 3. Panel of selected counties by significant shares and rates

County	Share in total (%)	County	Modification rates (%)
Rye			
Argeş	23.3	Călăraşi	5.1
Giurgiu	30.6		
Teleorman	62.7		
Wheat			
Călăraşi	24.4	Călăraşi	2.4
Ialomiţa	17.0	Giurgiu	1.9
Teleorman	26.5	Ialomiţa	2.7
Grain maize			
Călăraşi	21.1	Călăraşi	2.0
Ialomiţa	18.5	Ialomiţa	1.4
Teleorman	16.6	Prahova	0.7
Sunflower			
Călăraşi	26.6	Giurgiu	4.2
Ialomiţa	24.7	Prahova	6.1
Teleorman	26.0	Teleorman	3.5
Vegetables			
Dâmboviţa	31.5	Argeş	1.1
Ialomiţa	15.8	Dâmboviţa	6.2
Teleorman	14.5	Ialomiţa	2.0
Meat total			
Călăraşi	21.2	Călăraşi	0.2
Dâmboviţa	14.9		
Ialomiţa	15.4		

Cow and buffalo cow milk			
Argeş	24.6	Argeş	0.7
Dâmboviţa	17.6	Prahova	0.003
Teleorman	15.1		

Source: own calculations based on Tempo-Online data, NIS, 2017.

From the determination of high shares and high rates for the six representative products in the counties from South-Muntenia region, at least two operational criteria can be deduced, in order to substantiate the complex development alternatives in the region. *The first criterion* presupposes attributing high development rates to counties with high shares in total region, for each selected product, starting from the premise that the entities in which agricultural production develops even more strongly may become irradiating poles of related activities. *The second criterion* would presuppose attributing high rates to counties with low shares for the selected products, which would mean allocating additional material and financial resources in areas with low productivity levels. From the two operational criteria we opt for the first, according to which the additional investments can be more efficiently capitalized in entities with already well-established performance potential.

Taking into consideration the preliminary methodological benchmarks, the hypotheses and operational criteria presented above, the next step was represented by the substantiation of the development alternatives for agricultural production as a main pillar of complex development of the communities from South-Muntenia region. In this respect, 3 alternatives of feasible rates for total production development were identified, for the six representative agricultural products **(Table no. 4).**

Table no. 4. Projected rates for the main crop and animal products (%)

	Alternative 1 (A1)	**Alternative 2 (A2)**	**Alternative 3 (A3)**
Rye	5.1	5.1	5.1
Wheat	2.7	2.3	1.9
Grain maize	2.0	1.7	0.7
Sunflower	6.1	5.2	3.5
Vegetables	6.2	3.7	1.1
Meat total	0.2	0.2	0.2
Cow and buffalo cow milk	0.7	0.4	0.4

Source: own calculations based on Tempo-Online data, NIS, 2017.

Due to the high heterogeneity of annual average rates, in the period 1990-2015, in the selected counties for each representative product, the average rate for the three counties with the highest levels was adopted as alternative. Once the working hypotheses, operational criteria and development alternatives were established, the next step of the approach was represented by the quantification of prospective production evolutions for the representative products, from the selected communes, for the period 2016-2018, on the basis of formula:

$$Qp^k_{i,j} = Q0_{i,j} * (1+rQ^k_{i,j})^t, \text{ where:}$$

k = 1,2,3 – development alternatives; i = 1,2…6 – selected agricultural products; j = 1,2,3 – selected communes; t = 0,1…7 – forecast years; Qp = forecast level of total production; Qo = reference (baseline) level of total production; RQ = annual modification rate of total production.

The results of the econometric model application are presented for each of the six agricultural products and for the related counties.

Thus, for *rye*, the total production gain achievable in all three selected counties (Argeş, Giurgiu, Teleorman) ranges from 56.5 tons (2016) to 178.3 tons (2007) in Alternative 1 (**Table no. 5**).

Table no. 5. Alternative evaluations of total rye production in selected counties from South-Muntenia region, in the period 2016-2018 (tons)

	2016			2017			2018		
	A1	**A2**	**A3**	**A1**	**A2**	**A3**	**A1**	**A2**	**A3**
Argeş	233.7	233.7	233.7	245.5	245.6	245.6	258.0	258.2	258.2
Giurgiu	306.9	307.0	307.0	322.5	322.6	322.6	338.9	339.1	339.1
Teleorman	628.2	628.3	628.3	660.1	660.3	660.3	693.6	694.0	694.0
Total estimated	1168.8	1169.0	1169.0	1228.2	1228.6	1228.6	1290.6	1291.2	1291.2
Baseline	1112.2	1112.2	1112.2	1112.2	1112.2	1112.2	1112.2	1112.2	1112.2
Differences	56.5	56.7	56.7	115.9	116.3	116.3	178.3	179.0	179.0

Source: own calculations based on Tempo-Online data, NIS, 2017.

The analysis of obtained results highlights that Alternative 1 seems sustainable and realistic for the time horizon 2016-2018.

As regards *wheat production,* it should be specified that V3 is the optimum alternative, according to which the production gain in 2016 compared to 2015 is about 20000 tons. Although this product has multiple uses, both in the food and agricultural sector, representing a basic element for animal feed, it is difficult to estimate whether V1 or V2 variants are feasible in the current conditions. That is why, under the background of maintaining a certain reserve with regard to the increase of total wheat production, we consider it feasible to reach the quantity estimated under Variant 3 (Table no. 6).

Table no. 6. Alternative evaluations of total wheat production in selected counties from South-Muntenia region, in the period 2016-2018 (tons)

	2016			2017			2018		
	A1	**A2**	**A3**	**A1**	**A2**	**A3**	**A1**	**A2**	**A3**
Călăraşi	393464.7	392162.4	390417.5	403951.5	401281.9	400823.1	414717.8	410613.4	408319.0
Ialomiţa	274611.2	273702.2	272484.4	281930.2	280067.0	277580.3	289444.3	286579.7	282771.4
Teleorman	428073.8	426656.9	424758.5	439483.0	436578.5	432702.1	451196.2	446730.8	440794.2
Total estimated	1096149.7	1092521.5	1087660.4	1125364.7	1117927.4	1111105.4	1155358.4	1143924.0	1131884.7
Baseline	1067693.1	1067693.1	1067693.1	1067693.1	1067693.1	1067693.1	1067693.1	1067693.1	1067693.1
Differences	28456.6	24828.5	19967.4	57671.6	50234.3	43412.4	87665.3	76230.9	64191.6

Source: own calculations based on Tempo-Online data, NIS, 2017.

Grain maize, which is less a cash crop due to its prevalent use as animal feed, has slightly lower oscillations of the production gains by the three development alternatives, compared to the baseline level (Table no. 7).

Table no. 7. Alternative evaluations of total maize production in selected counties from South-Muntenia region, in the period 2016-2018 (tons)

	2016			2017			2018		
	A1	A2	A3	A1	A2	A3	A1	A2	A3
Călăraşi	416973.2	415637.9	411539.5	425381.7	422661.5	414367.5	433959.7	429803.9	417214.8
Ialomiţa	365950.4	364778.5	361181.6	373330.0	370942.7	363663.5	380858.3	377211.0	366162.5
Teleorman	329254.3	328199.9	324963.7	335893.9	333746.0	327196.7	342667.3	339385.8	329445.1
Total estimated	1112177.9	1108616.2	1097684.9	1134605.5	1127350.1	1105227.7	1157485.4	1146400.7	1112822.4
Baseline	1090193.6	1090193.6	1090193.6	1090193.6	1090193.6	1090193.6	1090193.6	1090193.6	1090193.6
Differences	21984.3	18422.6	7491.3	44411.9	37156.6	15034.2	67291.8	56207.1	22628.8

Source: own calculations based on Tempo-Online data, NIS, 2017.

Among the three alternatives, we consider that Alternative 3 seems more plausible, conferring total production levels that would cover not only the food and feed consumption needs, but also certain quantities for agri-food processing purposes (combined feed, starch industry, etc.).

By contrast with wheat, rye and grain maize, which are the main components of the domestic human food and animal feed consumption, the *sunflower crop production* was an activity that had to adjust to the domestic and foreign market requirements in the period 1990-2015. Taking into consideration that generally, the domestic market became relatively saturated as regards the domestic supply of sunflower oil, we consider it opportune to adopt Alternative A3, as strategy for the future development of this crop (Table no. 8).

Table no. 8. Alternative evaluations of total sunflower production in selected counties from South-Muntenia region, in the period 2016-2018 (tons)

	2016			2017			2018		
	A1	A2	A3	A1	A2	A3	A1	A2	A3
Călăraşi	103793.3	102863.7	101223.9	110150.1	108186.0	104764.1	116896.3	113783.6	108428.2
Ialomiţa	96270.6	95408.4	93887.5	102166.8	100345.0	97171.1	108424.0	105536.9	100569.6
Teleorman	101255.2	100348.4	98748.7	107456.6	105540.5	102202.3	114037.9	111001.3	105776.8
Total estimated	301319.1	298620.5	293860.0	319773.6	314071.4	304137.6	339358.2	330321.8	314774.7
Baseline	283929.7	283929.7	283929.7	283929.7	283929.7	283929.7	283929.7	283929.7	283929.7
Differences	17389.4	14690.8	9930.3	35843.8	30141.7	20207.9	55428.5	46392.1	30844.9

Source: own calculations based on Tempo-Online data, NIS, 2017.

Consequently, we adopted the annual average sunflower production increase rate from the period 1990-2015 (5.2%) as a feasible strategy, by which the achievable total production gain can cover both the eventual additional solvent demand, derived from the increase of the population's real incomes and the foreign market demand niches, which may emerge following the production oscillations in the representative growing areas for this crop.

Vegetables, crop that has highly suitable growth conditions in the counties from South-Muntenia region, had an accelerated average growth rate of total production in the period 1990-2015 (3.7%). Considering that the food complement role played by vegetables in relation to other components of the human food consumption is on the verge of exhaustion, on the one hand, and that the sale possibilities on the foreign market are relatively limited by the EU rigid quality standards, on the other hand, we consider it opportune to adopt Alternative 3 for vegetable production development in the selected counties, according to which production would increase by 3.7% each year (Table no. 9).

Table no. 9. Alternative evaluations of total vegetable production in selected counties from South-Muntenia region, in the period 2016-2018 (tons)

	2016			2017			2018		
	A1	A2	A3	A1	A2	A3	A1	A2	A3
Dâmboviţa	212684.2	207592.5	202500.7	225889.9	215203.6	204776.2	239915.5	223093.7	207077.3
Ialomiţa	106502.5	103952.8	101403.1	113115.3	107764.1	102542.5	120138.6	111715.1	103694.8
Teleorman	98117.9	95768.9	93420.0	104210.1	99280.2	94469.7	110680.6	102920.2	95531.3
Total estimated	417304.6	407314.2	397323.8	443215.2	422247.8	401788.5	470734.7	437729.0	406303.3
Baseline	392908.7	392908.7	392908.7	392908.7	392908.7	392908.7	392908.7	392908.7	392908.7
Differences	24395.9	14405.5	4415.1	50306.5	29339.1	8879.8	77826.0	44820.3	13394.6

Source: own calculations based on Tempo-Online data, NIS, 2017.

The production and consumption of meat – most often considered as performance barometer of a modern agriculture – should find favourable conditions in the rural communes located in the proximity of a great urban consumption center. From the perspective of annual average consumption of meat and meat products, one of the immediate solutions for improving it is the increase of pig and poultry meat production (as fast growing animal species, highly dependent on the fodder cereal production). In this context, among the three meat production development alternatives, in the three selected counties (Argeş, Giurgiu, Teleorman), we opted for Alternative 3, based on production growth by 0.2% (Table no. 10).

Table no. 10. Alternative evaluations of total meat production in selected counties from South-Muntenia region, in the period 2016-2018 (tons)

	2016			2017			2018		
	A1	A2	A3	A1	A2	A3	A1	A2	A3
Călăraşi	82397.1	81954.2	81954.2	82567.2	82118.1	82118.1	82737.7	82282.4	82282.4
Dâmboviţa	48005.0	48001.9	48001.9	48104.1	48097.9	48097.9	48203.4	48194.1	48194.1
Ialomiţa	49732.1	49728.9	49728.9	49834.8	49828.3	49828.3	49937.7	49928.0	49928.0
Total estimated	180134.2	179685.0	179685.0	180506.1	180044.4	180044.4	180878.9	180404.5	180404.5
Baseline	165830.9	165830.9	165830.9	165830.9	165830.9	165830.9	165830.9	165830.9	165830.9
Differences	14303.3	13854.1	13854.1	14675.3	14213.5	14213.5	15048.0	14573.6	14573.6

Source: own calculations based on Tempo-Online data, NIS, 2017.

One of the representative products considered appropriate for prospective evaluations in the selected communes from the region, i.e. *cow and buffalo cow milk*, had an annual average rate of 0.4% in the period 1990 – 2015, in total investigated counties. Following the application of this rate, we can opt for Alternative 2 or 3, with extremely small differences between them, resulting, in fact, from the rounding of values (Table no. 11).

Table no. 11. Alternative evaluations of total cow and buffalo cow milk production in selected counties from South-Muntenia region, in the period 2016-2018 (thousand hl)

	2016			2017			2018		
	A1	A2	A3	A1	A2	A3	A1	A2	A3
Argeş	1895.4	1888.4	1888.4	1909.4	1895.5	1895.5	1923.6	1902.5	1902.5
Dâmboviţa	1354.6	1349.6	1349.6	1364.6	1354.6	1354.6	1374.7	1359.7	1359.7
Teleorman	1164.0	1159.8	1159.8	1172.7	1164.1	1164.1	1181.4	1168.4	1168.4
Total estimated	4414.0	4397.8	4397.8	4446.7	4414.2	4414.2	4479.7	4430.6	4430.6

	2016			2017			2018		
Baseline	4381.5	4381.5	4381.5	4381.5	4381.5	4381.5	4381.5	4381.5	4381.5
Differences	32.5	16.3	16.3	65.2	32.7	32.7	98.2	49.1	49.1

Source: own calculations based on Tempo-Online data, NIS, 2017.

CONCLUSIONS

In the region South-Muntenia, there may be potential for the specialization of certain territorial entities in obtaining agricultural products, for which it has favourable natural and technical-economic conditions, necessary for an intensive agriculture practice. As a result of using the above-mentioned statistical model, three alternatives were obtained for the prospective level of total production, for each of the representative agricultural products.

Based on these indicative benchmarks, opportunity calculations can be made concerning the implementation of programs targeting the diversification of agri-food processing, as second pillar of the complex development of the communities from South-Muntenia region.

Starting from the premise that regional development, in general, and rural development, in particular, almost exclusively takes place through local initiatives, we consider that by the identification of development opportunities in the agri-food sector sphere, the main milestones of the complex development of the rural area from South-Muntenia region can be practically set.

The essential support in this period is more than ever represented by the objective intervention of decision-makers, both as regards the outline of strategic local development priorities, depending on the specific characteristics of each area, and mainly as regards the effective collaboration with the local authorities, in order to identify activities generating gross value added.

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