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# STUDY ON GROWTH / CONSERVATION ECONOMIC EFFICIENCY OF PRODUCTION PLANT GROWTH ARRANGEMENTS REGARDING ENVIRONMENTAL PERFORMANCE

ANA URSU<sup>1</sup>

**Summary:** *The study aimed to identify growth prospects / preservation of economic efficiency in terms of interventions to increase performance and in shaping the directions in which this objective can be. For the study started from two methodological premises: vegetable production systems design adapted plains, different shapes and sizes, which were performed simulating economic efficiency indicators for 2011-2014; second methodological premise was to identify needs for intervention and funding by increasing economic efficiency. After analyzing the efficiency and SWOT analysis concluded that modules are designed viable farm, while the yields observed scheduled and have the ability to invest in modern agricultural techniques to increase environmental performance. Under RDP 2014-2020, have been identified four priority areas of intervention: competitiveness of agricultural holdings, organization of food chains, agri-climate.*

**Keywords:** *economic efficiency, environmental performance, holdings*

## INTRODUCTION

"Most of the consulted in the development of this work show that the determinants of plant exploitable increase economic efficiency in different sizes. We can not talk about economic efficiency in the long term, without entering into discussion continued growth of labor productivity and profitability. So the key word when talking about growth is productivity efficiently. Thus the question "what are the determinants increase economic efficiency?" Turns into "what are the factors that increase productivity?". The answers to this question converge *investment physical capital, human capital, natural resources and technology*".

"The strategic directions of rural development policy aimed at increasing environmental performance relates to improving the competitiveness of the agricultural sector (restructuring needed to implement environmental sustainability implies a continuing challenge to increase economic performance of farms with the introduction of environmental protection measures and social development of rural areas) *improving land* (combining agricultural activities with environmental services); *increasing the quality of life in rural areas and encouraging diversification of economic* (local development strategies will play an important role in this direction); *training of labor* Local able to contribute to diversification of rural and structural changes necessary. To achieve the objectives mentioned measures are needed to reduce costs, increase the size of farms, promote innovation, market orientation, investment in physical and human capital, diversification of economic activities, obtaining quality products, environmentally friendly use of cleaner technologies; ensuring sustainable use of agricultural land improvements, to preserve and protect the natural landscape or as to enable EU priorities such as combating climate change, enhancing biodiversity and water quality, reduce the risk and effects of natural disasters [5]".

## MATERIAL AND METHOD

The methodology chosen for this study was to design plant production systems adapted plains, in different shapes and sizes of farm, level indicators and sub-indicators. This was the most important methodological premise. The second methodological premise aimed to provide an objective criterion for prioritization of measures to increase / conservation economic efficiency by identifying and funding necessary intervention to increase economic efficiency. Of course, this

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assumption implies some limitations conditioned by the RDP measures supporting agricultural competitiveness.

**Method** Optimal sizing used farm is *method variants*. Which was to design alternatives for a specific size or type of firm specializes holding for which we calculated a system of production and economic indicators. Depending on the level of these indicators and the objectives envisaged to choose the optimal size.

### Methodological approach

In determining priorities were reviewed "national strategic framework for sustainable development of the agri-food sector and rural areas in the period 2014-2020-2030" and RDP 2014-2020. In this context, we use the basic document RDP 2014-2020. It was a natural choice: if the EU will allocate resources according to the RDP, Romania should be comparable and consistent priorities, to access European funds. According to that document, they identified three priority areas of intervention: competitiveness of agricultural holdings, organization of food chains, agri-climate.

## RESULTS AND DISCUSSION

Technical and economic projections for the year 2013/2014 production in irrigated and non-irrigated crop system, based on technology and budget estimates of revenue and expenditure for each crop. For your own optimum manufacturing process, taking into account the criteria of economic efficiency, crop structure was established following:

- Module 20 ha (irrigated / non-irrigated) wheat (5 ha / 6 ha), corn (6 ha / 7 ha), barley (2 ha / 0 ha), fl. - Sun (4 ha / 3 ha), beans (1 ha / 2 ha), sugar beet (2 ha / 2 ha);
- For module 200 hectares (irrigated / non-irrigated) wheat (60 ha / 48 ha), corn (54 ha / 66 ha), barley (10 ha / 18 ha), fl. - The sun (30 ha / 30 ha), beans (10 ha / 20 ha soybean), sugar beet (10 ha / 10 ha), rape (26 ha / 8 ha);
- Module 1000 ha (irrigated / non-irrigated) wheat (320 ha / 200 ha), maize (250 ha / 330 ha), barley (50 ha / 90 ha), fl. - The sun (150 ha / 150 ha), soybean (50 ha / 100 ha), sugar beet (50 ha / 50 ha), rape (130 ha / 80 ha).

### SUMMARY STATEMENT SUMMARY OF INDICATORS

Profile: grain crops

Production System - non-irrigated

Nc.	INDICATORS	MODULE 20 ha		Module 200 ha		How 1000 ha	
		lei	€ = 4.5 lei	lei	€ = 4.5 lei	lei	€ = 4.5 lei
1	The value of primary and secondary production	64409	14313	735110	163358	4250640	944587
2	Subsidies	15430	3429	154300	34289	771,500	171444
3	Crude product (1 + 2)	79839	17742	889410	197647	5022140	1116031
4	Total expenses, D.C.:	61927	13761	672210	149380	3674960	816658
4.1	- Variable costs	52593	11687	577767	128393	3231868	717907
4.1.1	- Specific variables	28709	4265.8	292595	65021	1635756	363501
4.2	- Fixed costs	9334	2074	94443	20987	443092	98465
5	Net profit 3- (4 + 16% tax)	15046	3344	182448	40544	1131632	251474
6	Net profit ratio (5: 4x100) (%)	24,3	x	27,1	x	30,8	x
7	Standard Output (Reg.CE 1242/2008)	55749	12388,7	536588	119242	2692334	598296
8	European size class	x	IV	x	VIII	x	X
9	Development Fund (60% -50% of profit + depreciation)	9820	2182	95604	21245	585816	130181
10	Investment opportunities credits (9 x 5 years)	49100	10911	478,020	106227	2929079	650,906
11	Funds for the resumption of production (15% of profits)	2257	502	27367	6082	169745	37721
12	Funds for labor and management (5% - 10% of profit)	752	167	18245	4054	113163	25147

13	Funds for capitalization (20% -25% of profit)	3009	669	45612	10136	282908	62868
14	Total equity to production (FDP + row 11)	50483	11218	560972	124660	3069336	682075
15	Loans for production (Cp) *	13700,3	3045	138605	30801	775368	172304
16	Consumption of work (thousand hours / year / holding)	1,5	x	13,1	x	62,0	x

\* Credits production covers 50% of the costs of inputs

### Conclusions:

- The financial resources required to cover the total costs are: 77.9% and 22.1% Cp FDP (20 ha); FDP 79.4% and 20.6% CP (200 ha); FDP 78.9% and 21.1% CP (1000 ha);
- Module shows a net profit rate of 24.3% and provides an average profit of 752.3 lei / ha; 27.1% and provides an average profit of 912.2 lei / ha; 30.8% and provides an average profit of 1131.6 lei / ha
- Total Standard Output (SO) expresses "the monetary value of agricultural production which includes sales, valued at farm gate prices": IV (20 ha); VIII (200 ha); X (1000 ha)
- Development Fund constituted makes it possible investment in the purchase of agricultural equipment for purchase through loans of almost the entire set of equipment needed tractor 65 HP (20 ha) - 95 hp (200 ha) - 100 PS (1000 ha).
- Modules can be achieved by designing economically viable given that yields are obtained and there will be programmed to increase the coefficient of efficiency concerns of equity, profit and turnover to ensure prudent financial policy designed to rationalize costs and achieve competitive prices.

## SUMMARY STATEMENT SUMMARY OF INDICATORS

PROFILE: grain crops

Production System - irrigated

Nc.	INDICATORS	MODULE 20 ha		MODULE 200 ha		MODULE 1000 ha	
		lei	€ = 4.5 lei	lei	€ = 4.5 lei	lei	€ = 4.5 lei
1	The value of primary and secondary production	97932	21763	1072020	238227	6374760	1416613
2	Subsidies	15430	3429	154300	34289	771500	171444
3	Crude product (1 + 2)	113362	25192	1226320	272516	7146260	1588058
4	Total expenses, D.C. :	86146	19144	908062	201792	5099756	1133279
4.1	- Variable costs	72104	16023	750478	166773	4288761	953058
4.1.1	- Specific variables	45279	4265.8	338735	75274	1072469	238326
4.2	- Fixed costs	14042	3121	157584	35019	810995	180221
5	Net profit 3- (4 + 16% tax)	22862	5080	259343	57632	1670680	371262
6	Net profit ratio (5: 4x100) (%)	26,5	x	28,6	x	32,8	x
7	Standard Output (Reg.CE 1242/2008)	56852	12633,9	539102	119800	2710444	602321
8	European size class	x	IV	x	VIII	x	X
9	Development Fund (60% -50% of profit + depreciation)	14756	3279	136,041	30231	867190	192709
10	Investment opportunities credits (9 x 5 years)	73779	16395	680206	151157	4335950	963544
11	Funds for the resumption of production (15% of profits)	3429	762	38901	8645	250,602	55689
12	Funds for labor and management (5% - 10% of profit)	1143	254	25934	5763	167068	37126
13	Funds for capitalization (20% -25% of profit)	4572	1016	64836	14408	334,136	74252
14	Total equity to production (own + Fd rd 11) *	72832	16185	788102	175134	4851571	1078127
15	Loans for production **	16742,6	3721	158861	35302	498787	110842
16	Consumption of work (thousand hours / year / holding)	2,3	x	20,8	x	104,0	x

\*\* Loans production covers 50% of the costs of production factors

### Conclusions:

- **Financial resources** necessary to cover the total costs are: 80.6% and 19.4% FDP Cp (20 ha); FDP 82.5% and 17.5% Cp (200 ha); FDP 90.2% and 9.8% Cp (1000 ha);
- The modules show a **net profit rate** 26.5% and provides an average profit of 1143 lei / ha (20 ha); 28.6% and provides an average profit of 1296.7 lei / ha (200 ha); 32.8% and provides an average profit of 1670.7 lei / ha (1,000 ha);
- **Development Fund** up makes it possible investment in the purchase of agricultural equipment for purchase through loans almost the whole set of equipment needed tractor 65 HP (20 ha) - 95 hp (200 ha) - 100 PS (1000 ha).
- The modules made by design have high economic viability in terms of obtaining yields scheduled

**Farm budget**  
*Simulation of key economic indicators, 2011-2014 - Draft version*

Lowlands

*Profile of "grain crops"*

Indicators	Periods, harvest, year	U.M.	MODULE					
			20 ha Non - Irrigated	20 ha Irrigate	200 ha Non - Irrigated	200 ha Irrigate	1000 ha Non - Irrigated	1000 ha Irrigated
<i>Total income</i>	2011/2012	lei	72372	109858	831160	1205320	4847560	7099340
	2013/2014	lei	64409	97932	735110	1072020	4250640	6374760
Increases or decreases	Δ	lei	-7963	-11926	-96050	-133 300	-596 920	-724 580
<i>Subsidies</i>	2011/2012	lei	11596	11596	115960	115960	579800	579800
	2013/2014	lei	15430	15430	154300	154300	771500	771500
Increases or decreases	Δ	lei	+3834	+3834	+38340	+38340	+191700	+191700
<i>Total expenditure</i>	2011/2012	lei	68795,4	96160,8	759949,4	1050358,9	4196684	5853145
	2013/2014	lei	61926,5	86145,9	672210,1	908062	3674960	5099756
Increases or decreases	Δ	lei	-6868,9	-10014,9	-87739,3	-142296,9	-521 724	-753 389
<i>Gross profit + grants</i>	2011/2012	lei	16131	25293	187171	270921	1230676	1825995
	2013/2014	lei	17912	27216	217200	318258	1347180	2046504
Increases or decreases	Δ	lei	+1781	+1923	+30029	+47337	+116,504	+220509
<i>Net profit + grants</i>	2011/2012	lei	13550	21246	157223	227574	1033768	1533836
	2013/2014	lei	15046	22862	182448	267337	1131632	1719063
Increases or decreases	Δ	lei	+1496	+1616	+25225	+39763	+7864	+185227
<i>Net profit + rate subsidies</i>	2011/2012	%	19,7	22,1	20,7	23,4	24,6	26,2
	2013/2014	%	24,3	26,5	27,1	29,4	30,8	33,7
Increases or decreases	Δ	%	+4,6	+4,4	+6,4	+6,0	+6,2	+7,5

Source: Own calculations

SWOT Analysis				
COMPONENT	STRENGTHS	WEAKNESSES	OPPORTUNITIES	RISKS
<b>Resources</b>				
<b>Natural</b>	Production systems and favorable climatic conditions allowing crop diversification Crop rotation and crop structure framed in specific rotations plain area	Households show a high degree of under-utilization of production potential given natural conditions;	Opportunities exist within national and European programs support the development and diversification of holdings îmbunătățind their competitive position;	Maintaining a small farm, with implications for performance and viability
<b>Fixed</b>	Crop diversification ensures uniform operation of the means of production	Material and technical facilities necessary to ensure environmental developing performance is poor Low level of equipment with modern	Investment in physical capital	Higher investment costs Reduced access to credit
<b>Raw materials - Current assets</b>	Capacity supply inputs necessary resuming production	-	Strengthening the position in relation to suppliers	Failure of crops
<b>Financial Resources</b>	Farms have adequate capital	Financial resources necessary to cover the	Improving mechanisms for stimulating production	The volatility of agricultural prices.

	and production loans;	total costs are provided at a rate lower than the irrigation system; Development Fund constituted creates fewer opportunities for investment in agricultural machinery and modernize the production process in the medium term;	farms carrying freight and stimulate internal and external market of agricultural products	
<b>Relations</b>				
<b>Competition</b>	Competitive production scale is small average exploitable	Decreased performance Low prices of agricultural recovery, reduces capitalization fund.	Integration of proper storage facilities	The intervention of specialized intermediaries
<b>Media Relations</b>	-	Unresolved problems of pollution and waste recovery	Using funds provided by international organizations	Insufficient investment sources for remediation
<b>Activities</b>				
<b>Organization</b>	Agricultural activities are conducted in organizational structures with legal status; Fall in European typology of economic size;	Production activities in households provides low profitability compared with the activities associative system or company	Introduction of related services relevant determinant for ensuring continuity and long-term business profitability Diversification of agricultural activities (vegetable cultivation, livestock)	The rising cost of agricultural inputs (fuel, fertilizer and chemicals for treatment) and the cost of bank loans. Create competitive disadvantages fair participants
<b>Technology</b>	Increasing the share of high value added products	-	Attracting investment in high technology and adaptation of export production to the requirements of foreign markets Installation of the farm products processing, so that farmers earn more from the value-added farm products	Lack of financial resources for a policy of investment in research and development Getting the lower grade if not respected production technology
<b>Results</b>				
<b>Income</b>	The increase in operating revenue growth faster than operating expenditures	Low production yields		Input prices increase due to inflation
<b>Gross profit</b>	Increase due to higher crude SAPS subsidies	Increasing the supply of products on the market		Price volatility
<b>Effectiveness</b>				
<b>Development Fund</b>	Increased possibility of buying credits	-	Investment in tractors and related equipment	Lack of own sources of funding High interest

## CONCLUSIONS

Given the above, farms must build real prospect of growth / preservation *economic efficiency of plant and animal production in terms of interventions to increase environmental performance* in two directions

- Management structural changes
  - Concentration (critical mass size farms);
  - Cooperation (working together to supply inputs, mechanical works and the efficient execution of products);
  - Integration (bottom-up approach by developing local partnerships and networking cluster);
- Competitive improving management (horizontal policies)
  - Investment in agricultural exploațiile
  - Technology and innovation in environmental
  - Human capital development

In full accordance with the RDP 2014-2020, the growth priorities / conservation economic efficiency of crop production in terms of interventions to increase environmental performance are:

- **P2:** Increasing farm viability and competitiveness of all types of agriculture and promoting innovative agricultural technologies;
- **P3:** Promoting food chain organization, including processing and marketing agricultural and risk management in agriculture;
- **P4:** Restoring, preserving and enhancing ecosystems that are related to agriculture;
- **P5:** Promoting resource efficiency and supporting the shift towards a low carbon economy more resilient to climate change in agriculture and food sector.

Analysis of the current situation, based on national priorities identified in the structure of the RDP 2014-2020, emphasized the necessity to act on the directions above. On the other hand, between these priorities and between their respective indicators requires a shift from hierarchical factors for investments, according to the state of the plant competitive agricultural sector.

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