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ECONOMIC IMPACT OF BIODIVERSITY CONSERVATION IN AGRICULTURE EXPLOATATION IN SOUTH OF ROMANIA

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Abstract

Biodiversity, as variation of life form on Earth is the base of agriculture, in each of its fields, from the food to the services provided by ecosystems, the main streams and links of production. Standards or requirements that farmers must meet to be eligible for subsidies contribute to maintain biodiversity. The purpose of this paper is to estimate the costs needed to implement environmental standards and their implications for farm rentability. This study was made in farms with different size in the south part of Romania. Even if it can be seen a increase of production expenses which lead to a light decrease of farms profitability, the long-term benefit of biodiversity conservation is considerably.

Key words :, *biodiversity, costs,gross margin, rentability, standards or requirements*

INTRODUCTION

Biodiversity embraces the variety of genes, species and ecosystems that constitute life on Earth. We are currently witnessing a steady loss of biodiversity, with profound consequences for the natural world and for human well-being. The main causes are changes in natural habitats. These are due to intensive agricultural production systems, overexploitation of forests, oceans, rivers, lakes and soils, pollution and — increasingly — global climate change.[1] Humankind is itself a part of biodiversity, and our existence would be impossible without it. Quality of life, economic competitiveness, employment and security all rely on this natural capital. The agricultural and industrial revolutions led to dramatic and accelerating changes in land use, intensification of agriculture, urbanisation and land abandonment. This in turn has resulted in the collapse of many practices (e.g. traditional agricultural methods) that helped to maintain biodiversity-rich landscapes. European lifestyles rely heavily on the import of resources and goods from all over the world, often encouraging unsustainable exploitation of natural resources. This leads to loss of biodiversity which in turn damages the natural capital resources on which social and economic development is based.

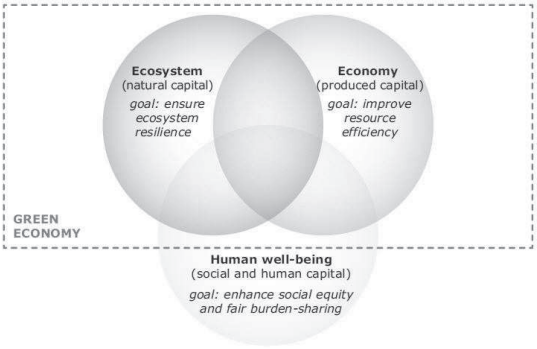


Fig. 1 The 'green economy' concept in the context of sustainable development. (Source: European Environment Agency)

Appears necessary to increase the positive contribution of agriculture to the environment, the need to reduce pollution from agriculture and adoption of agricultural policy so that it takes account of the environment. This can be achieved by practicing sustainable agriculture with cleaner technology that can eliminate all negative aspects about the interaction between environment and agriculture.

That is why, it was necessary to elaboration, and the practical implementation of codes of good agricultural practice. These are a set of scientific and technical knowledge available to farmers, the farmers to be implemented in practice. Acquired by each farmer and

[1] The European environment – state and outlook 2010 EEA (European Environment Agency), Published: Nov 29, 2010

implemented correctly, agricultural practices can contribute to achieving the profitable and superior quality productions, as well as to environmental conservation, with limited adverse environmental consequences at national, regional, local, short term or longer.

The common agricultural policy on cross-compliance is established by Community regulations. Farmers must comply with Good Agricultural and Environmental Conditions (GAEC) on the whole agricultural area of farms (even if not requested direct payments for those areas) to avoid being penalized to payments.

Good Agricultural and Environmental Conditions[2] in Romania have been based on standards listed below:

I. STANDARDS SOIL EROSION ON AVOIDANCE

GAEC 1 - During winter, arable land must be covered with winter crops and / or remain fallow after harvest on at least 20% of total arable surface of the farm.

GAEC 2 - The works on the arable land land with a slope greater than 12% planted with weeding plants is performed along the contour.

GAEC 3 - maintain existing terraces on agricultural land on January 1, 2007.

II. STANDARDS FOR MAINTAINING SOIL ORGANIC MATTER CONTENT

GAEC 4 - Sunflower is grown on the same parcel not more than 2 consecutive years.

GAEC 5 - Burning of Arable stubble is not permitted without the consent of the competent authorities for environmental protection.

III. STANDARDS FOR MAINTAINING SOIL STRUCTURE

GAEC 6 - Not allowed ploughing in humid soil conditions.

IV. STANDARDS FOR MAINTAINING A MINIMUM LEVEL OF MAINTENANCE THE AGRICULTURAL LAND

GAEC 7 - Maintenance of permanent grasslands by providing a minimum level of grazing or mowing them at least once a year.

GAEC 8 - No is allowed burning of permanent grasslands

GAEC 9 - not allowed felling of trees and or groups of trees on agricultural land

GAEC 10 - Avoiding installation of unwanted vegetation on agricultural land, including land not used for production

V. STANDARDS FOR PROTECTION AND MANAGEMENT OF WATER

GAEC 11 - Protect water against pollution and run-off, and manage the use of water.

MATERIAL AND METOD

Compliance with these rules increases variable costs. Therefore, an appropriate method for measuring the profitability of farm production activities would be gross margin calculated for each type of farm activity[3].

Knowing farm income and variable costs, gross margin can be calculated by subtracting all variable costs of production related revenues one production unit; relationship for calculating the gross margin is:

Gross margin = Revenue - Variable costs

At the level of a firm that carries out several activities (with several branches of production), by adding together the gross margins of all branches of production, total gross margin is obtained.

Usually, it offers a image more complex on farm profitability, but for the image to be complete, it requires the correlation of the total gross margin with amount of fixed costs[4].

By calculating gross margins to the branches of farm, can be obtained and observed trends of final financial results (profit or loss), practically, gross margin values allow the separation of information on:

- ***Profitability of the branches of production;***

In the branches of production profitable, gross margin will be positive and the production unprofitable branches may have negative gross margin. Gross margin, calculated for each species or category (gross margin / cow / pig / poultry etc..) or for each type of crop (gross margin / ha maize silage / ha barley / rape etc ha.) allows the branches hierarchy according to their profitability.

[2] Annex III of Council Regulation (EC) No 73/2009

[3] Hutu, I. - Family farm management - Guidelines for the management of family farms and primary economy - Ed Waldpres 2004.

[4] Popescu, A., 2010 - Financial management and business management in dairy farms. Ed. Agris. Bucharest, 63

➢ ***Profitability of farm;***

We believe that gross margin is a barometer of profitability, positive margin is an indication that the activity is worthwhile and that business can continue in this direction. Conversely, negative gross margin could portend financial deficit. In achieving gross margin, are included many expenses of the farm and so can be shown, projected or demonstrated the effect of any changes.

RESULTS AND DISCUSSION

We watched the calculation indicators of economic efficiency in two farms, in the southern area of Romania, located in similar climatic conditions, they are differentiated by area cultivated, number of employees and level of technical endowment. In both farms are respected Good agricultural and environmental condition for awarding grants.

Table 1. Farms description

Specification	Cultivated area (ha)	Number of employees	Number of tractors
Farm 1: S.C. ALINAGRA S.R.L. Sageata, county Buzau	**300**	**5**	**5**
Farm 2: S.C. FLAGRA COM S.R.L. Drajna, county Prahova	**65**	**2**	**2**

1. The analysis of economic efficiency in **S.C.** Alinagra S.R.L., Sageata, Buzau county

Table 2. The analysis of the economic efficiency of wheat – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	2982
2.	Variable costs	1428,20
3.	Gross margin (R1-R2)	1553,8
4.	Fixed Expenses	771,14
5.	Gross profit (R3-R4)	782.66
6.	Total expenditure = R2+R4	2191,34
7	Gross profit rate (%) = R5/R6x100	35,71
8.	Income tax (16 % x R5)	125,23
9.	Net profit = 5-8	657,43
10	Net profit rate (%)= R9/R6x100	30.00

Calculating like the weighted average to the gross margin per holding we have obtained 1567,32lei/ha

2. The analysis of economic efficiency in S.C. Flagra Com S.R.L. Drajna, jud. Prahova county

Table 3. The analysis of the economic efficiency of corn – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	3.464,00
2.	Variable costs	1150,88
3.	Gross margin (R1-R2)	2.313,12
4.	Fixed Expenses	1070,18
5.	Gross profit (R3-R4)	1242,32
6.	Total expenditure = R2+R4	2221,06
7	Gross profit rate (%) = R5/R6x100	55,93
8.	Income tax (16 % x R5)	198,77
9.	Net profit = 5-8	1043,55
10	Net profit rate (%)= R9/R6x100	46,98

Table 4. The analysis of the economic efficiency of sun flower – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	1963,4
2.	Variable costs	588,82
3.	Gross margin (R1-R2)	1374,58
4.	Fixed Expenses	436,14
5.	Gross profit (R3-R4)	940,44
6.	Total expenditure = R2+R4	1024,96
7	Gross profit rate (%) = R5/R6x100	91,75
8.	Income tax (16 % x R5)	150,47
9.	Net profit = 5-8	789,97
10	Net profit rate (%)= R9/R6x100	77,07

Table 5. The influence of crop structure on gross margin in the holding S.C. Alinagra S.R.L. Sageata, Buzau county

Culture	Area		Gross margin Lei/ha	Gross margin /activity
	ha	%		
Wheat	155	51,67	1553,8	240.839,00
Corn	32	10,67	2313,12	74.019,84
Sunflower	113	37,66	1374,58	155.327,54
Total farm	300	100		470.186,38

Table 6. The analysis of the economic efficiency of wheat – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	2339
2.	Variable costs	1130,20
3.	Gross margin (R1-R2)	1208,8
4.	Fixed Expenses	645,14
5.	Gross profit (R3-R4)	563,66
6.	Total expenditure = R2+R4	1775,34
7	Gross profit rate (%) = R5/R6x100	31,74
8.	Income tax (16 % x R5)	90,18
9.	Net profit = 5-8	473,48
10	Net profit rate (%)= R9/R6x100	26,66

Table 7. The analysis of the economic efficiency of corn – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	3.377,00
2.	Variable costs	1278,88
3.	Gross margin (R1-R2)	2098,12
4.	Fixed Expenses	980,18
5.	Gross profit (R3-R4)	1117,94
6.	Total expenditure = R2+R4	2259,06
7	Gross profit rate (%) = R5/R6x100	49,48
8.	Income tax (16 % x R5)	178,87
9.	Net profit = 5-8	939,07
10	Net profit rate (%)= R9/R6x100	41,56

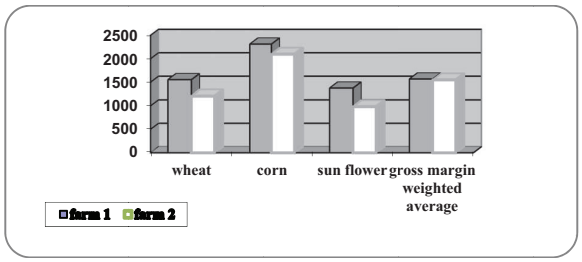
Table 8. The analysis of the economic efficiency of sun flower – 1 ha -

No.	Specification	Value (Lei)
1.	Gross Product	1997,00
2.	Variable costs	1012,28
3.	Gross margin (R1-R2)	984,72
4.	Fixed Expenses	712,68
5.	Gross profit (R3-R4)	272,04
6.	Total expenditure = R2+R4	1724,96
7	Gross profit rate (%) = R5/R6x100	15.77
8.	Income tax (16 % x R5)	43,52
9.	Net profit = 5-8	228,52
10	Net profit rate (%)= R9/R6x100	13,24

Table 9. The influence of crop structure on gross margin in the holding S.C. FLAGRA COM S.R.L. Drajna, jud. Prahova county

Culture	Area		Gross margin Lei/ha	Gross margin /activity
	ha	%		
Wheat	15	23,09	1208,8	18132,0
Corn	30	46,15	2098,12	62943,6
Sunflower	20	30,76	984,72	19694,4
Total farm	65	100		100770

Calculating like the weighted average to the gross margin per holding we have obtained 1550,29 leiha



Graphic 1. Gross margin per activity and weighted average

Usually, if the effect of changes in farm can quantify this is more convincing. For example, calculation of gross margin as the weighted average, leads to results nearly equal in the two farms, even if there are differences in terms the gross margin on culture. This is made possible by a more judicious crop structure chosen for the second holding.

CONCLUSIONS

The activity of the two farms is a profitable, under compliance to the cross - compliance measures for biodiversity conservation. This is possible in conditions of granting of subsidies. Lack of subsidies for the vegetal sector would reduce the profitability of agricultural holdings.
Exist the possibility increase crop yield of the farm under biodiversity conservation by increasing gross margin and reducing variable costs.
In the first case this is possible by increasing production per hectare by using varieties with high yield potential, resistant to drought, diseases and pests, adapted to local conditions, or by products valorification at a price favourable.
Reduce variable costs per hectare can be done by: negotiation of the purchase price; reduce the amount used for various inputs; use of performance equipment and technologies and finding new solutions to reduce the amount of fertilizer per hectare (manure, green manures)

REFERENCES

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