ROMANIA'S IRRIGATION SYSTEMS AND CROPPING TENDENCIES

MARIOARA RUSU[1]
[1]*Institute of Agricultural Economics, Romanian Academy, Bucharest – mara.r@xnet.ro*

Abstract: *Irrigation facilities play an important role in the development of agriculture in Romania. Over the years, there have been consistent investments in irrigation systems, which occupied 22% of the agricultural area in late 2011. However, the share of irrigated area was located below 10% in most years, after 1989. The main objective of this paper was to analyze the structure and evolution of areas farmed by the main crop groups in five irrigation systems. The main conclusion that emerged was that the crop structure indicates the existence and development of intensive and professional agriculture attributes. This shows an increase in the areas under high value crops, a trend that could be a chance for poor rural communities to reduce their dependence for grain crops, and facilitate the transition from subsistence to market-oriented agriculture.*

Key words*: crop structure, irrigation system, high value crops, Romania*

INTRODUCTION

High Value Crops (HVC) is those that offer farmers the opportunity to get both revenue growth and increased stability farm / enterprise through crop diversification. Rising areas under this crop group could be a chance for poor rural communities to reduce their dependence, in particular from grain cropping, and facilitate the transition from subsistence farming to market-oriented agriculture (IFAD, 2008).

In the literature, HVC refers generally to agricultural crops, such as vegetables, fruits, flowers, ornamental plants, herbs and spices. Those cultures are known to have a net yield per hectare higher than widespread crop (IFPRI, 2007). Therefore, they generally produce higher monetary value than staple crops, existing and developed on local, regional and national markets. HVC is a good opportunity for farmers to increase their income by participating in food chains, on condition that there is vertically efficient coordination, to ensure a balance between supply and demand (USAID, 1998).

Rising acreage with HVC, and implicitly increasing their production, requires as a precondition, the presence of proper infrastructure: the existence of appropriate seeding and planting material sources, appropriate extension and consultancy service and, not least, the presence of a cold chain (from harvesting to retailing) for fruit and vegetables grown.

MATERIALS AND METHODS

Irrigation facilities play an important role in the development of agriculture in Romania. Over the years, it has invested consistently in irrigation systems that in late 2011 have occupied 22% of the total agricultural area. However, the share of irrigated area was located below 10% in most years.

The main objective of this paper aims to analyze the structure and evolution of area under main group of crops in five main irrigation systems - Sadova – Corabia, Nicoresti Tecui, The Viziru Terrace, The Braila Terrace and Covurului Plain.

Statistical data behind this analysis covered the period 2007-2011 and came from the following sources: a) statistical data / information provided by Paying and The Intervention Agency for Agriculture (PIAA)- for the crops structure and b) national statistical data provided by The National Institute for Statistics.

In this paper crops with the potential to generate higher revenues under irrigation were considered in accordance with Annex 3 of "Strategy for investment in irrigation sector" as follows: seed lots, vegetables, vineyards, orchards, arable fodders, sugar beet, rice, corn, peas, beans, soya bean, medicinal and aromatic plants (MARD, 2011).

RESULTS AND DISCUSSIONS

In irrigation systems, where small farms predominate, to become efficient crop structure should rely on high value-added crops, crops that can make consistent profits, allowing thus turning conditions created by fitting areas for irrigation.

Average area under crops in the analysis area (considering together the five systems under study) from 2007 to 2011, was 75,551 ha, which represents 91% of the agricultural area PIAA registered. Uncultivated areas had an yearly variation, between a minimum of 5297 hectares in 2007 and a maximum of 8144 ha in 2010. The share of cultivated area was mainly influenced by the evolution in the Sadova –Corabia System.

Structure of area under crops can provide signals on how resources (in this case land) affect economic efficiency. Between analyzed groups of crop, cereal grains were growth in the highest rate in the analyzed area, with a significant yearly variation (52% in 2010 and 58% in 2008) and an average of 55% (41 873 ha). Within this group, wheat and rye grown on large areas, which reached a maximum of 37% of the total cultivated area in 2009 and a minimum of 26% in 2007.

However, in the analyzed area, the average area occupied by high economic value crops was 33,295 ha, which represents 44% of the total cultivated area. In the under review period there has been a change in this area: a minimum of 39% in 2009 to a peak of 48% in 2007.

Table 1

Area under High Value Crops

Crops	Average area (2007-2011)		Differences (2011-2007)	
	ha	%	ha	%
Corn and sorghum	19417	58	1472	7
Melons & pumpkins	2030	6	862	57
Vegetables	1490	4	-120	-7
Soya bean	1368	4	-1958	-64
Legumes	328	1	143	49
Medicinal and aromatic herbs	138	0	-18	-41
Alfalfa	4463	14	1583	46
Seeds lots	2117	6	323	15
Orchards	505	2	-96	-17

Source: author's processing after PIAA, 2012

Analysis of HVC structure shows predominance of area under corn - 1914 ha (58%). There were annual variations: the lowest rate was recorded in 2009 - 52% and the highest in 2008 - 62%. With a share of 14%, alfalfa was grown on 4463 hectares and was the second HVC of importance, varying from 9% in 2007 to 16% in 2010. Thirdly in HVC structure stood seed lots - 6% (2117 ha).

An analysis on the irrigation systems of the area under HVC reveals that only in The Nicoresti Tecuci System this indicator is above average: in this case HVC had 72% (5476 ha). The dominant crop was corn (63%) followed by vegetables (18%), alfalfa (11%) and seed lots (3%). The Braila Terrace it grew the same percentage as that

registered in total area - 44% (3238 ha). Crop structure was more balanced: 41% corn, 23% alfalfa, 13% seed lots, 10% vegetables and 10% soya bean. In The Viziru Terrace, 9366 ha were grown with HVC, which represents 42% of total cultivated area. The corn was predominantly (57%), but it was cultivated large areas with seed lots (16%) and alfalfa (16%). In The Sadova Corabia, HVC had a share of 40%: dominant crops were corn (58%), vegetables (19%) and grapes (13%). In The Covurului Plain, HVC represented 39% of the total cultivated area. Specific crops for this System were corn (65%), alfalfa (19%) and soybeans (6%) (Fig. 1 and 2).

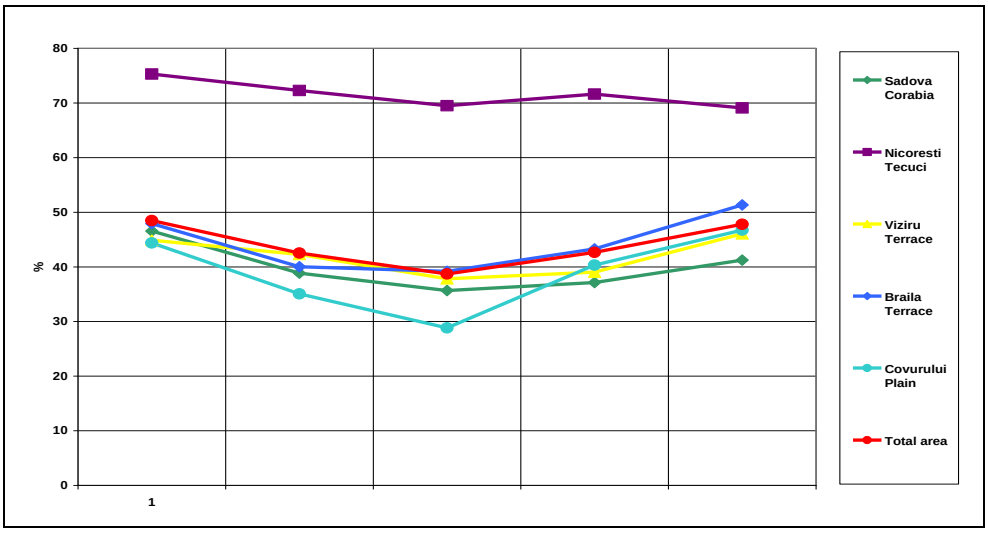

Fig. 1 Evolution of the area under HVC on irrigation systems and total analyzed area, 2007 - 2011

(Source: author's processing after PIAA, 2012)

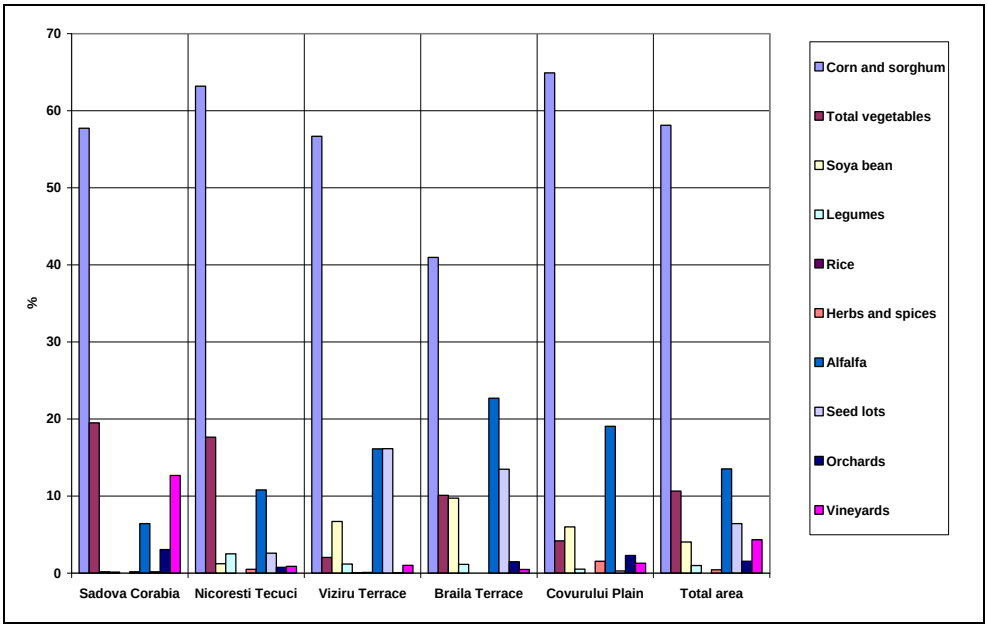

Fig. 2 HVC share on groups of crops and irrigation systems, 2007-2011

(Source: author's processing after PIAA, 2012)

In 2011 compared with 2007, in the analyzed area it noted a significant decrease in the area under the following crops: soya bean, herbs and spices, vines and fruit trees. Significant increases were registered at legumes, alfalfa and vegetables (especially watermelons) and in the case of the corn and seed lots were registered slight increases.

Analysis of HVC share in 2011 compared with 2007, on the irrigation system, highlights the following situation (Fig. 3):

- in Sadova Corabia System Ship have grown larger areas with herbs and spices, alfalfa, seed lots, melons, vegetables and soybeans in the detriment of maize, grain legumes and horticultural crops (vineyards and orchards);
- In The Nicoresti Tecuci Terrace, except areas under soya bean and orchards, all other crops with high economic value showed a higher percentage than in 2007;

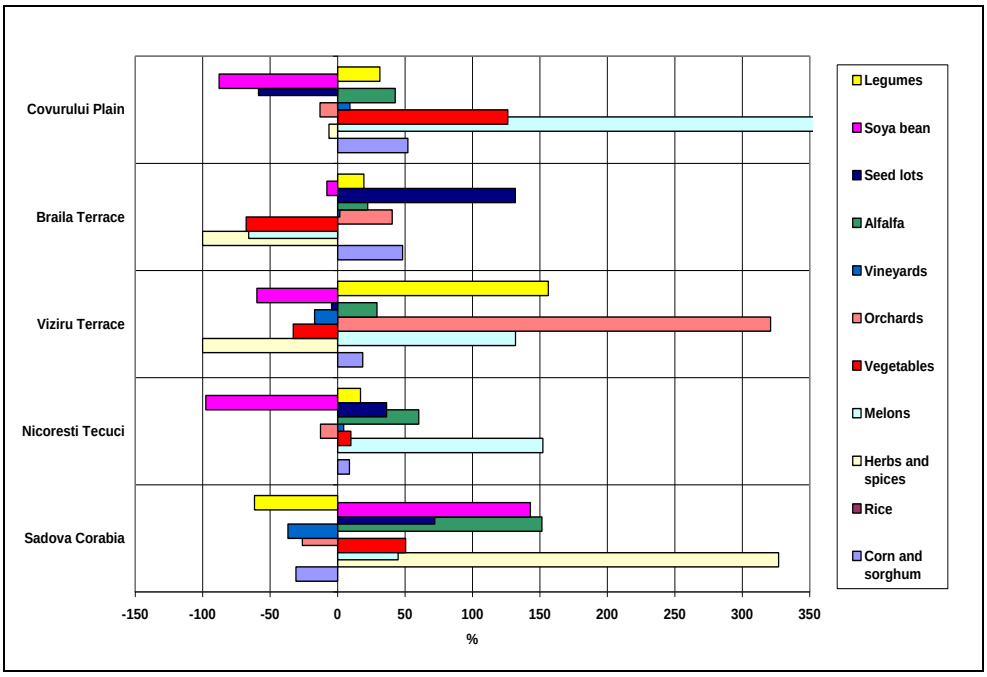

Fig. 3 The evolution of HVC area on irrigation systems, 2011 vs. 2007
(Source: author's processing after PIAA, 2012)

- significant increase of areas under melons and legumes were met in The Viziru Terrace, while area decreased in the case of soya bean, vegetable, seed lots, vines, herbs and spices;
- The Braila Terrace registered major declines in area under melons and vegetables;
- area cultivated with vegetables, melons, alfalfa and corn increased in The Covurului Plain System, but there were significant decreasing in soya bean and seed lots areas.

CONCLUSIONS

The main conclusion that emerged from this analysis is that the crops structure in the five analyzed irrigation systems indicate a relatively high share of crops with high economic value. In four of the five systems - Nicoresti Tecuci (+11%), Viziru Terrace (+6%), Braila Terrace (+22%) and Covurului Plain (+27%) area under HVC increased in 2011 compared with 2007, the only system that has been a negative trend was Sadova Corabia (-17%). This trend could be a chance for poor rural communities where the small farms are predominant, reducing their dependence, in particular of grain cropping, and facilitate the transition from subsistence farming to market-oriented agriculture, signaling the emergence and development of intensive agriculture with professional attributes.

REFERENCES

1.CROSSON, P, (1992), *Sustainable Agriculture*, Resources, 106: 14-17.
2.FAO, (1995), *Environmental Impact Assessment of Irrigation and Drainage Projects* - ftp://ftp.fao.org/agl/aglw/Morini/05_EIA.pdf.
3.FRANCIS, CHARLES A., (1988), *Research and Extension Agenda for Sustainable Agriculture*. American Journal of Alternative Agriculture 3:123-126.
4.GRUMEZA, N., KLEPŞ, C., ŞI VASILICĂ, CARMEN, (2002), *Cercetări şi rezultate privind retehnologizarea amenajărilor de irigaţii din România în contextual protejării mediului înconjurător*, Bucureşti, Editura Eren.
5.HARWOOD, R.R., (1990), *A History of Sustainable Agriculture* - http://cjrs-rcsr.org/archives/16-3/Smit-Smithers.pdf .
6.IFAD, (2008), *The role of high-value crops in rural poverty reduction in the Near East and North Africa*,
http://www.ifad.org/pub/pn/crop.pdf.
7.IFPRI, (2007), *Diversification in Indian Agriculture towards High-Value Crops The Role of Smallholders*,
http://www.ifpri.org/sites/default/files/pubs/pubs/dp/ifpridp00727.pdf.
8.IONIŢĂ, G., (1998), *Participating Irrigation Management*, Bucureşti: Revista INPIM.
9.LOCKERETZ, W., (1988), *Open Questions in Sustainable Agriculture*, American Journal of Alternative Agriculture 3:174-181.
10.MADR, (2011), *Strategia Investiţiilor în Sectorul Irigaţiilor*,
http://old.madr.ro/pages/strategie/strategie-investitii-irigatii.pdf.
11.MADR şi BM, (2009), *Proiect de reabilitare şi reformă a irigaţiilor, Analiza economică a sectorului de irigaţii*. Raport final.
http://www.madr.ro/pages/strategie/proiect-de-reabilitare-si-reforma-a-irigatiilor.pdf.
12.RUSU, MARIOARA, (2012), *Raportul de evaluare a impactului agricol*, PRRSI, unpublished paper.
13.USAID, (1998), The Definition and Role of High-Value Commodities in MARD/Rapti Technical Report No. 17,
http://pdf.usaid.gov/pdf_docs/PNACN652.pdf.
***, http://www.madr.ro/ro/
***, http://www.anif.ro/