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IMPROVING IRRIGATION SYSTEMS AS A SOLUTION FOR RURAL DEVELOPMENT

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Abstract

Of the total population of Romania, about 45%, according to INS, are living in rural areas, and in terms of area, of the 23.84 mil. ha, approximately 14.7 mil. ha, or 62%, is arable land. Of these 14.7 mil., only 1.7 mil. ha are irrigated.
Given that agriculture is one of the main branches of the Romanian economy, being considered by the public authorities, the locomotive that will restart the economy.
Why are speaking in future tense? Because, as it's said in the structural documents of Romania, the Romanian agriculture has a great potential to develop, potential that comes from the state of significant degradation of irrigation systems, machine wear and lack of new techniques of culture, so that production yields are approximately 40% of the average European countries.
The emphasis in the 2014-2020 programming period is the development of rural areas, in this context we cannot forget the development of the irrigation system, especially if we look in the past, during the communist period, when irrigation systems proved their worth.
Today, the desire for economic alignment with the EU, in the context of a country with agricultural profile, obliges us to emphasize that in the development of infrastructure and agricultural services, the irrigation systems represent a lasting investment in rural development.

Key words*: irrigation system, rural developing, potential*

INTRODUCTION

Rural development, in general terms, regards reducing the gaps between the urban and rural areas.
The Romanian rural area is characterised by a high rate of migration towards urban, aged population, lack of sanitary, educational or transportation infrastructure and a high appreciation for land propriety.
After the first seven years of European programming, the rural area started to renew, the youngers started to come back home and take the lead of the farms, to start new business, the authorities started to train their people and work out the infrastructure problems.
The agricultural yield is yet a problem to be solved in the next years, the funding for an efficient and competitive agriculture, sector that needs to be at the same pace with the Western Europe.
The irrigation system is a very important component of performant agriculture, so the paper states that financing this sector could be a way to achieve the efficiency and competitiveness we need so much.

MATERIALS AND METHODS

In order to demonstrate the need for developing the irrigation system, in order to have an agricultural performance, I analysed, in comparison, the level of productivity in agriculture in Europe as an average and in Romania in the last 7 years.
The period analysed in this study was 2007-2014.
The data, collected from the European and Romanian database, have been processed and interpreted, to see if there is any relevance in the statement I first made.

RESULTS AND DISCUSSIONS

Irrigated area is defined as the area of crops which have actually been irrigated at least once during the 12 months prior to the reference day of the survey. Crops under glass and kitchen

gardens, which are almost always irrigated, should not be included (Eurostat, Common context indicators for rural development programs (2014-2020) – Irrigated land).

The acceptance of the fact that a farm is a business, and including an irrigation system represents a business decision that implies costs and benefits is a need.

For that kind of decision to be seen as needed to be made, a farmer has to be sure that the crops structure is adequate for irrigations and the costs of such a system and its use will be covered by the profit brought by the production of irrigated crops.

The problems that are met in the Romanian irrigation sector in this moment are represented mainly by the sharp state of degradation of the existent system, reminiscence of the communist time when the programed economy was working, by lack of financial and organisation power for maintaining the existent system or building a new one.

The Minister of Agriculture and Rural Development, Daniel Constantin, says that for "the rehabilitation of irrigation infrastructure is necessary an estimated budget of 370 mil. euro, amount pre-set in the NPRD 2014-2020 by Measure 04 – the infrastructure needed for developing and modernisation or adaptation of agriculture and forest, including the access to agricultural and forest areas, including consolidation and improvement of land and saving energy and water, and sub measure 4.3 refers directly to irrigation sector through the efficiency of water use in agriculture, mentioning the need of observance of the Frame Water Directive for obtaining finance." (Tintareanu. C., http://agroromania.manager.ro/articole/subventii/daniel-constantin-avem-fonduri-europene-pentru-reabilitarea-intregii-retele-secundare-de-irigatii-16605.html).

The comparison with all the European countries is irrelevant due to their climatic regime. Countries like Great Britain or the Northern Countries don't have a reason for setting up an irrigation system due to medium rain quantity each year.

In Table 1 we can see the evolution of irrigated areas in European countries, evolution that sustains the above affirmation.

Table 1. Evolution of the surface suitable for irrigations in the European countries (ha)

GEO/TIME	2005	2007	2010
Belgium	51.540	48.010	42.850
Bulgaria	534.610	493.130	370.490
Czech Republic	42.250	39.400	22.860
Denmark	51.680	44.620	42.100
Estonia	27.750	23.340	19.610
Ireland	132.670	128.240	139.890
Greece	833.590	860.150	723.060
Spain	1.079.420	1.043.910	989.800
France	567.140	527.350	516.100
Croatia	:	181.250	233.280
Italy	1.728.530	1.679.440	1.620.880
Cyprus	45.170	40.120	38.860
Latvia	128.670	107.750	83.390
Lithuania	252.950	230.270	199.910
Luxembourg	2.450	2.300	2.200
Hungary	714.790	626.320	576.810
Malta	11.070	11.020	12.530
Netherlands	81.830	76.740	72.320
Austria	170.640	165.420	150.170
Poland	2.476.470	2.390.960	1.506.620
Portugal	323.920	275.080	305.270
Romania	4.256.150	3.931.350	3.859.040
Slovenia	77.170	75.340	74.650
Slovakia	68.490	68.990	24.460
Finland	70.620	68.230	63.870
Sweden	75.810	72.610	71.090
United Kingdom	286.750	226.660	186.800
Iceland	:	:	2.590
Norway	53.000	49.940	46.620
Switzerland	63.630	61.760	59.070
Montenegro	:	:	48.870

Source: Eurostat, database analysis, February, 25th.

A descending trend can be observed across all countries, the irrigation systems being set up only in areas where their profitability is very high, as part of the eco-friendly politics. Although Romania has a very high potential for irrigations, a study of the Agriculture and Rural Development Ministry that uses the same data concludes that only 17% or 504.814 ha have viable irrigation systems, of which 245.514 ha are represented by gravitational systems and 259.300 by pumping systems.

Land organised for irrigation has a percentage of 20% or 597.203 ha, the rest of the land that enters in the database as suitable for irrigations is not viable, with a percentage of 63% or 1.830.911 ha.

As part of the development strategies, setting up a viable irrigation system is a priority, especially in the food security context. The arable land potential of Romania is unexploited and underequipped.

Table 2. Irrigated land as percentage in European Union

Country	Irrigated land (ha)	Irrigated land (% of UAA)	Total UAA (ha)
European Union	9.998.810	5,69	175.815.160
Belgium	4.260	0,31	1.358.020
Bulgaria	90.400	2,02	4.475.530
Czech Republic	19.200	0,55	3.483.500
Denmark	320.180	12,10	2.646.860
Germany	372.750	2,23	16.704.040
Estonia	330	0,04	940.930
Ireland	0	0,00	4.991.350
Greece	1.025.210	19,80	5.177.510
Spain	3.044.710	12,82	23.752.690
France	1.583.610	5,69	27.837.290
Croatia	14.480	1,10	1.316.010
Italy	2.408.350	18,73	12.856.050
Cyprus	28.290	23,89	118.400
Latvia	710	0,04	1.796.290
Lithuania	1.530	0,06	2.742.560
Luxembourg	:	-	131.110
Hungary	114.550	2,44	4.686.340
Malta	2.830	24,72	11.450
Netherlands	137.310	7,33	1.872.350
Austria	26.480	0,92	2.878.170
Poland	45.530	0,32	14.447.290
Portugal	466.330	12,71	3.668.150
Romania	133.460	1,00	13.306.130
Slovenia	1.260	0,26	482.650
Slovakia	14.840	0,78	1.895.500
Finland	12.610	0,55	2.290.980
Sweden	63.250	2,06	3.066.320
United Kingdom	66.350	0,39	16.881.690

Source: Eurostat, Common context indicators for rural development programs (2014-2020) – Irrigated land.

From Table 2 we can observe that only a 5.69% of total units in agriculture have irrigation systems, the countries with the highest endowment in the irrigation sector are Greece, Spain, Italy, Cyprus and Malta, countries that have a geographical advantage of being close to the Mediterranean Sea, closeness that gives the possibility of a reduced irrigation water cost.

Romania has a very small percent of irrigated land, of only 1%, if we take into account the fact that the position of our country is a very good one, being geographically privileged, the mountains providing the attraction of precipitation needed, a well spread hydrological basin that offers the opportunity for a developed pumping system are not well managed.

The investment in an irrigation system has to be seen as a business decision in the case of owners of a great surface of arable land or, as the European context dictates for associative structures, as they are seen as the solution for rural development.

For people to understand the need for such a system they have to be trained, to be open to new politics and economic trends, to understand and apply them, to make rational decisions, to connect with the consumers demand and for all of that to be possible they have to be a working part of the economic system. Having a performant farm, the step that needs to be made in order to have power over the market, especially now that we are speaking of a European or even global market.

In terms of potential Romania has the best chances of becoming a great power in agriculture again, but the investments are at very low rate.

The first statement of Investment Strategy in the Irrigation System, that it is not the state's job to improve the irrigation systems but the individuals is not applicable due to the low income of the farmers. The GDP per capita in 7 of the 8 regions of Romania is below the E.U. average, 75% of it, the North-Est region, South region and South-Est, known as mainly rural and with high agricultural potential have only 29.33%, 39.33% and 37.67% of the GDP per capita average (NPRD 2014-2020).

For this reason the European Commission has agreed to set a sub-measure that finances irrigation systems in order to achieve their higher goals in what concerns Romania, the sub-measure 4.3 in NPRD 2014-2020.

Table 3. Irrigated land in Romania – Regional stage

Label	Irrigated land (ha)	Irrigated land (% of UAA)	Total UAA (ha)
Romania	133.460	1,00	13.306.130
Nord-Vest	270	0,01	1.808.350
Centru	910	0,06	1.627.290
Nord-Est	2.420	0,12	1.940.160
Sud-Est	93.790	4,27	2.194.370
Sud - Muntenia	28.360	1,22	2.333.680
Bucuresti - Ilfov	150	0,24	62.450
Sud-Vest Oltenia	6.550	0,41	1.608.410
Vest	1.020	0,06	1.731.410

Source: Eurostat, Common context indicators for rural development programs (2014-2020) – Irrigated land

The agricultural basins of Romania localised mainly in the North-East and South regions

have very low rates of irrigations, South-East has a special approach due the Danube closeness which sustains the highest rate of irrigation. This is also the region where the remains of the communist irrigation system still works, the canals being restored or kept in their formal stage.

The low GDP per capita in this region comes from the lack of other industries.

For an irrigation system to work, the Strategy has a few focal points depending of the particularities of each type of improvement, in the case of restoring the system once built, such as:

- adapting infrastructure to existing agricultural structures;
- uncultivated agricultural land tax increases;
- Development of a framework agreement between NARW and irrigation water users, enabling them and the latter to water when they need it;
- Actions of organization of farmers. This measure is one common to all systems that are intended to be reactivated. In Romanian agriculture predominate individual actions, so if it works only with placing an order and expect the farmers to organise it will not reach the intended outcome. Therefore, the system requires a Technical assistance for farmers (even for large farms) to assist them in organizing irrigation system;
- Watering equipment. Since the system has not been used for a long period, farmers haven't invested in irrigation equipment. A potential investor should have in mind and how they will ensure farmers watering equipment.
- Adapting irrigation method used by farmers. The size of farms growing vegetables require a different design of unused systems, so as to allow individual methods applied drip irrigation or furrow used by vegetable growers in the area (The Investment Strategy in Irrigation Sector, p. 52).

The local systems are characterised mainly by the lack of a clearly defined territory of the system; water is taken directly from the source and irrigate as needed depending of the watering equipment availability; the use is of a single farmer; the reduced irrigated area; irrigated bring high added value; cereals are not irrigated, vegetables and animal feed only; using low power pumps; costs are identified and taken completely by use (The Investment Strategy in Irrigation Sector, p. 53).

These problems to be solved in the next years as a priority for rural development should provide a proper base for farmers to be competitive in the European and global market.

Studies show that the medium price of irrigation water in 2009 was 525 lei/1000 m^3 in Romania, at least 529 lei/1000 m^3 in Bulgaria and about 462 lei/1000 m^3 in a few English farms, as we can see the price in Romania is not different from other countries, it's the stage of the system that is different and lowers the Romanian performance.

CONCLUSIONS

A minimum investment in tree windbreaks can solve a lot of Romania's irrigation problem. In some systems, farmers have applied this method, as can be seen in Ialomita, Calarasi and Braila. Due to the phenomena of reducing and smoothing wind speed, important water economies are made in the protected area by decrease of crop evapotranspiration process (259 m3/ ha / season), conservation and more efficient use of rainfall in winter and used in summer (228 m3 / ha / season), increasing efficiency of application of sprinkler watering in the field (293 m3/ ha / season) (The Investment Strategy in Irrigation Sector, p. 8).

Irrigation hasn't dropped after 1990 due to economic factors, but after degradation mode of agricultural operations in farms.

Irrigations are an input that has to come with farm development; it can't be seen prior to other critical operations in farms.

Romania has a great potential for rural development but reaching that potential is in order for achieving the 2020 Strategy.

The past period has created a gap between farmers, landowners and authorities of any kind, gap that couldn't be bridged in 25 years,

so the equipment and systems that were built in that period have been mostly destroyed as an act of liberation.

In order to reduce the regional gaps there have to be made great investments by authorities, but the interest has to come from the beneficiaries.

The lack of cooperation between farmers has a great influence in all the rural developing problems, the start of cooperation would be a new beginning for solving every other problem.

The high price of energy is more a myth kept between farmers, the lack of information showing it's claws, because compared to a lost crop in a high temperature summer, the cost is more than acceptable.

A very high risk for the development of the sector of irrigations and rural developing per total is for the E.U. to continue it's daunting policy regarding irrigations because Romania isn't a great energy consumer and supporting the irrigation sector could be a catching up to western countries.

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