

RESEARCHES CONCERNING THE REQUIREMENT OF IRRIGATION IN SOUTH REGION – MUNTENIA

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ABSTRACT

The paper presented deals with the problem of soil fertility potential, but impaired due to quantity and time distribution of rainfall, due to decreasing precipitation and increasing amounts of global average temperature where crop irrigation may be the main solution to obtain production to meet food needs of the population (Christian Brauner, 2002) .

In Romania, areas affected by drought and desertification are Dobrogea, southern Oltenia, Wallachia and Moldavia, and Bărăgan, with low precipitation amounts, ranging from 300-500 mm and a global average air temperature in the south and east, rising by 0.8^o C (Guidance on adapting to climate change, 2008).

According to statistics provided by the INS, the total irrigated surface waning, determine productions and low yields of the crops (grains and maize) in the studied area, South - Wallachia.

INTRODUCTION

A hazardous weather phenomenon and more frequently, affecting large areas of land for a long time is drought caused by the intense climate change (C. Brauner, 2002; Karl, T.R., et. al., 2009; Ding Ya, et. al., 2010).

Increase in global average air temperature, about 0.74^o C in the last decade, are arid regions to become drier and start to expand. The causes of climate change are multiple, one of the growing hole in the ozone layer and greenhouse effect more pronounced.

Lack of irrigation systems in South Wallachia and ever smaller areas that apply to irrigation, lowers the total yields of all crops (Nicolaescu M. și colab., 2003). Romania mainly grow cereals and maize, especially in the south, so these cultures are studied, in terms of total output, recorded from 2007 to 2010. To prevent cases due to prolonged drought, Romania promotes the implementation of policies and practices for identification, analysis, evaluation and monitoring to reduce their risks.

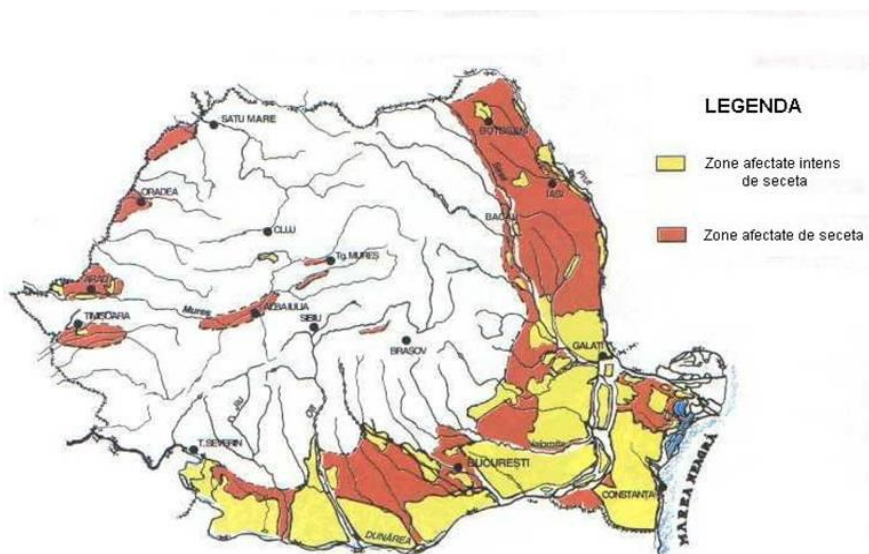
MATERIAL AND METHODS

For the study conducted, documentation was the main element that has been collected and analyzed information and interpretation of statistical data provided by the INS, synthesized pointing the processes and phenomena that pose problems for agriculture, irrigation, due to destruction in Romania.

RESULTS AND DISCUSSIONS

In Romania, the multi-annual variation of the average quantities of precipitation, indicating a decreasing trend in terms of water resources, causing negative effects on the productive potential of the field crops.

In the Romanian Plain, irrigation facilities situation pose serious challenges to agriculture, because of the aridity index (AI) increased between 0,50 to 0,65 which requires the need for irrigation (figure 1).



Zonele afectate de seceta in Romania
Figure 1. Areas affected by drought in Romania

The AI aridity index values indicate a high degree of aridity of the far southern areas of the Romanian Plain, Southern Wallachia. Subject area as defined UNCCD desertification (United Nations Convention to Combat Desertification) (land degradation in arid, semiarid and sub humid-dry), are precisely those with aridity index between 0,05 to 0,65 values that are found in area studied.

An aspect of climate extremes (often manifested by the occurrence of droughts) are amplified by the current state of irrigation systems that require upgrading works, and works that aim to increase the surface that can be irrigated, as indispensable to boost the physical and chemical properties the land of dry-sub humid regions of Romania (Vranceanu A. et al., 2007).

After the most recent estimates presented in the fourth report of the International Committee on Climate Change in 2007, is expected in Romania, annual average warming to be as the Europe-wide, with 0,5 to 1,5 °C for the period 2020 - 2029 (Ministry of Agriculture and Rural Development, 2009).

Irrigation facilities in the Romanian Plain, South Region - Wallachia, are non-functional in most due to lack of operating equipment, and poorly maintained of various components of these systems.

According to the Statistical Yearbooks, in 2000-2004 were irrigated areas between 85.000 ha and 569.100 ha, and in 2005 fell sharply to reach 45.719 ha, after increasing slightly in 2007 to 96,224 ha.

National Administration of Land Improvements (ANIF), reports that during 2008 to 2009, irrigated area has increased in the country, being irrigated between 257.666 ha and 296.750 ha (figure 2). From 2010 the trend is decreasing leading to surface only 103.295 ha in 2011.

In recent years there has been a drastic decline in irrigated areas due to destruction of irrigation systems and lack of program funding these facilities.

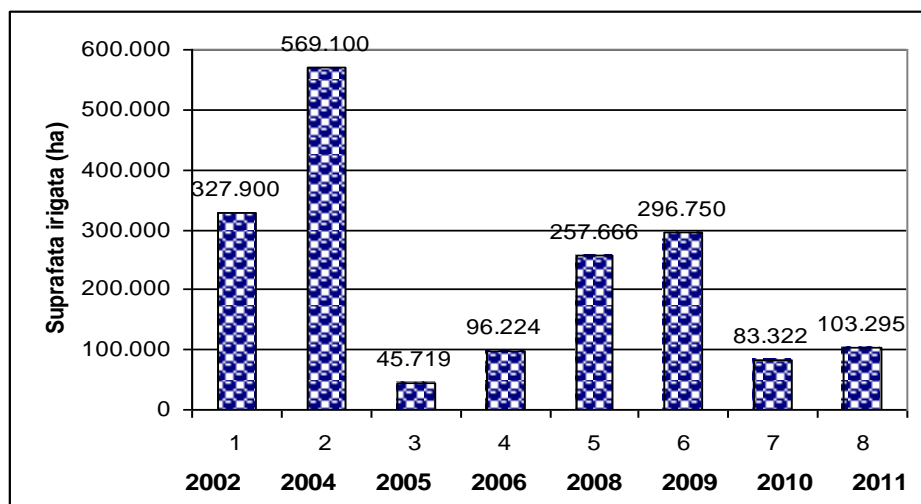


Figure 2. Evolution of the area actually irrigated (at least one watering), during 2002-2011

Some of these systems are in operation, is administered by the National Society of Land Improvements (SNIF), this administration is in the process of being transmitted to Associations of Irrigation Water Use (AUAI) who bring together interested farmers to apply irrigation.

If in 2011 is expected that the surface irrigation works designed with the 3.498.000 ha, in reality, surface watering applied is only 100.341 ha (figure 3).

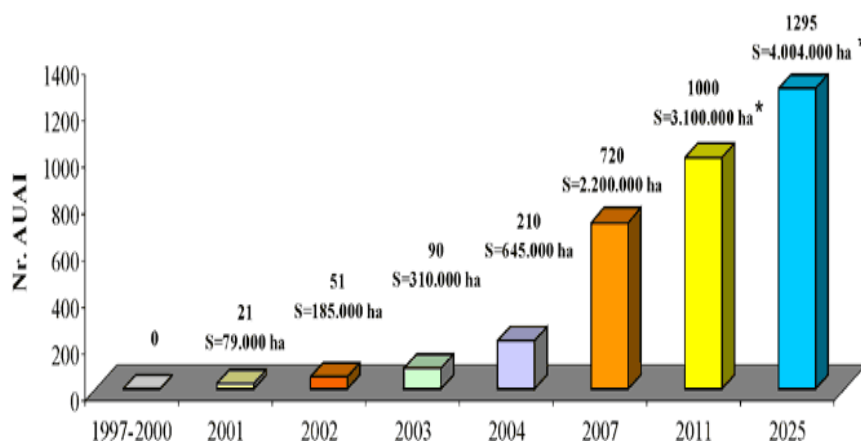


Figure 3. Stage privatization of irrigation facilities by shifting to Irrigation Water Users Associations (AUAI) from 2000 to 2007 and for the years 2011-2025

On actual irrigated agricultural area with at least one watering South Region counties, we find that there are counties in which irrigation were not applied in the last 3 years, like Dâmbovița and Argeș counties. In Giurgiu County only in 2010 were irrigated 495 ha and average area irrigated in Prahova County is significantly reduced, this being only 15,6 hectares. And in Teleorman and Călărași counties have the same situation in this chapter; irrigation is insignificant compared to their farming area.

Table 1

Effectively irrigated farmlands at least one watering in South Region of Romania

Regions	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012
	Ha	Ha	Ha	Ha	Ha
South Muntenia Region	47684	69995	12526	18748	14304
Arges	-	20	-	-	-
Calarasi	19648	23807	1838	6304	615
Giurgiu	-	3903	495	-	-
Ialomița	22192	33424	9836	11960	13285
Prahova	11	16	22	25	4
Teleorman	5833	8825	335	459	400

County with a better situation in this respect is Ialomița, where irrigated areas increased progressively in recent years, reaching in 2012 the irrigated area of 13,285 ha.

Table 2

Crop production of grains, in South Region – Muntenia (Walachia)

Regions	Year 1997	Year 2007	Year 2008	Year 2009	Year 2010	Yield average 2007-2010
	Tons	Tons	Tons	Tons	Tons	Tons
South Muntenia Region	5254544	1308537	4041140	3626028	3878279	3213496
Arges	356722	191512	341890	341157	338514	303268,3
Calarasi	1254896	226521	1042824	700165	795629	691284,8
Dambovită	408088	173586	328372	387720	322284	302990,5
Giurgiu	624261	149183	516709	487846	562824	429140,5
Ialomița	1089394	171977	729384	540738	651984	523520,8
Prahova	510595	141910	294547	357200	347030	285171,8
Teleorman	1010588	253848	787414	811202	860014	678119,5

In 2011, compared with 2010, in Romania is cultivated mainly maize (49,8% of the area under cereals grain) and wheat (36,8%).

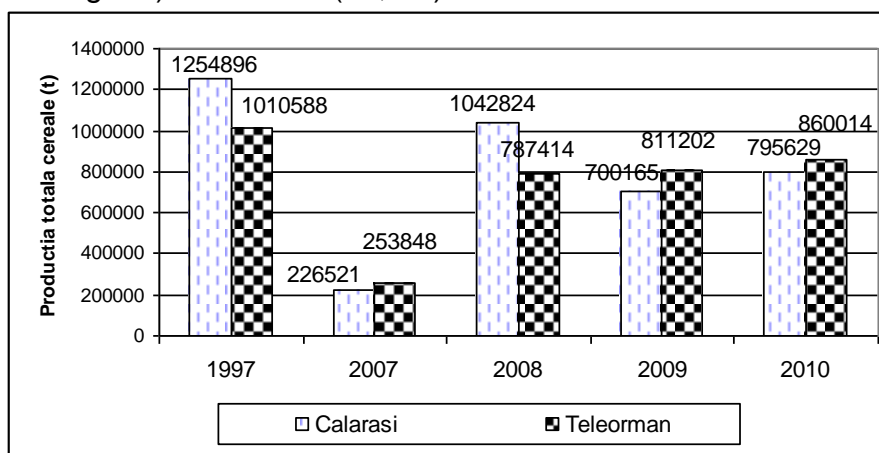


Figure 4. Evolution of total grains production, Calarasi and Teleorman counties

Nationwide, grain production of cereals increased by 24,4% compared to 2010 (20.785 tons to 16.713 tons in 2010), due to higher yields (production per hectare), as follows: wheat (37,1%), and maize grain (3,6%), according to National Institute of Statistics.

In terms of yields obtained in Calarasi and Teleorman counties, counties with similar climatic conditions, we see that within 10 years (1997-2007) total production decreased by 70%, from 1.254.896 tons in 1997 to 226.521 tons in 2007 for Calarasi county, total production levelling off lately (2008-2010), (figure 4) at about 680.000 tons for the average total productions in the two counties. Similar situation happened in Teleorman County.

Lack of irrigation systems and soil water deficit is reflected well in productions obtained for crop yields in counties with water shortages, being inversely proportional to supply crops with water productions lowest recorded in Dambovița and Argeș counties. Cereal crop yields decreased by about 50%, with a total production of 338.514 tons in Dâmbovița county, respectively 347.030 tone in Arges county; comparing with cultures in Ialomița county where irrigation was applied, and productions were 651.984 tons.

Most fertile soils in the Teleorman county, also increase production, obtaining a quantity of 860.014 tonnes of cereal grains on the whole arable area cultivated.

In 2011, Romania was, in fifth place among EU Member States, both in terms of area under cultivation and the production obtained from wheat (7102.9 thousand tonnes) back of countries like France, Germany, England and Poland, and the ninth in terms of yield, which was 3684 kg / ha.

Table 3

Maize production, in South Region – Walachia

Regions	Year 1997	Year 2007	Year 2008	Year 2009	Year 2010	Yield average 2007-2010
	Tons	Tons	Tons	Tons	Tons	Tons
South Muntenia Region	3007115	463617	1448641	1684462	1794856	1347894
Arges	204941	101069	176971	194404	195039	166870,8
Calarasi	635977	58043	299197	244876	317809	229981,3
Dambovita	268289	93415	199074	269453	185481	186855,8
Giurgiu	364065	32382	180623	193379	229827	159052,8
Ialomita	638014	36826	232917	217170	256524	185859,3
Prahova	366330	97502	171033	237292	239604	186357,8
Teleorman	529499	44380	188826	327888	370572	232916,5

In counties with the tradition of growing maize for grain, Călărași, Giurgiu, Ialomița and Teleorman county, average total production decreased by 50% between 2007- 2010, compared to 1997, which happened at the macro South Region- Wallachia (figure 5).

Evolution of the total production of maize in the period 2007 - 2010, indicates a growing trend from year to year, with an average of 1374894 tons last four years.

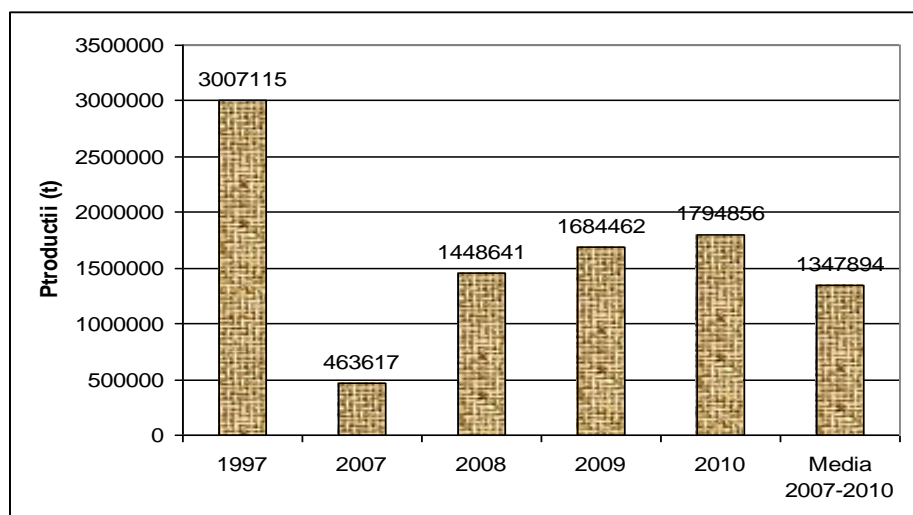


Figure 5. Evolution of maize productions during period 1997-2010

At European level, Romania was the first in cultivated area with maize, and ranked second place concerning the maize production, after France, due to a lower yield 4464 kg / ha. Maize yield achieved by Romania is lower than other EU Member States. (National Institute of Statistics. Press release no. 70/2012).

CONCLUSIONS

Fluctuation of multiannual average annual quantities of precipitation shows a decreasing trend in terms of water resources, resulting a limiting factor with negative effects on productivity of field crops, and this is water from rainfall.

The low availability of water, heat stress and risk of drought, and irrigation application associated with the low temperatures, caused total production and low yields in grain crops and maize grain.

In the last four years is seen to increase total production from maize grain, but reported in 1997, this is more down.

On climatic conditions farmers can use crop varieties suited to new weather conditions (eg genotypes adapted to the potential environmental zones, varieties / hybrids of plants well adapted to pedoclimatic extremes).

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