The Effects of the Reform Process and Accession to EU Structures on Land Improvement and Irrigations

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1. Introduction

Water is needed for most economic activities, but agriculture is the most water-intensive sector, using 70% of global withdrawals. Each year some 7,100 cubic kilometres of water are consumed by crops to meet global food demand, the equivalent of 90 times the annual runoff of the Nile River, or more than 3,000 litres per person per day. Most of it (78%) comes directly from rainfall, the reminder from irrigation. Techniques to control soil moisture and intensify agricultural production have been substantially improved in the last 50 years in many parts of the world. Irrigation is increasing globally, in all income groups and all regions. While the world's cultivated land increased by about 13% from 1961 to 2003, the irrigated area almost doubled, from 10% to 18% of cropland [5].

Competition between water for food production and for other sectors will intensify, but food production will remain the largest consumer of water worldwide. Water productivity is much lower in agriculture than it is in industry. Globally, there is more than enough water for domestic purposes, for agriculture, and industry. But access to water is very uneven across and within countries. Severe climatic conditions reduce regularly and drastically agricultural production, directly affect agriculture's export capacity and its capacity to meet the population's need in terms of food safety. One of the most important means by which adverse effects of climate change can be countered is investments in land improvements.

The purpose of national strategies for land improvement is to prevent and eliminate the negative effects of drought and other climate and terrain issues affecting the stability of domestic production and the food security of the population.

However, the land improvements sector continues to suffer from lack of support, primarily financial and, in addition, the EU accession requires a drastic reduction of subsidies in this area irrespective of the vital needs of the agriculture and the urgent need to counteract the effects of droughts and floods on the environment in Romania.

Different regions have limited access because of their lack of purchasing power and because of inappropriate policies that limit their access to infrastructure. Regional development is the provision of aid and other assistance to regions which are less economically developed. European regional policy is designed to bring about concrete results, furthering economic and social cohesion to reduce the gap between the development levels of the various regions [11].

The policy helps to finance concrete projects for regions including for irrigated agriculture. The idea is to create potential so that the regions can fully contribute to achieving greater growth and competitiveness and, at the same time, to exchange ideas and best practices about agriculture, irrigation and water management.

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Furthermore, European water management policy is applied based on a single system of water management: River basin management. This means that for each river basin district - some of which will traverse regional and national frontiers - a "river basin management plan" will need to be established and updated every six years, and this will provide the context for the co-ordination requirements identified above and also for the concrete projects regarding water use [11].

Since Romania is in the same situation described above, beginning with the EU accession, must comply with policies and directives related to water management, agriculture and irrigation, and adapt these policies to its own legislation and agricultural policy.

Because of population growth, between 2000 and 2025 the global average annual per capita availability of renewable water resources is projected to fall from 6,600 cubic meters to 4,800 cubic meters [6].

Given the uneven distribution of these resources, however, it is much more informative that some 3 billion women and men will live in countries—wholly or partly arid or semiarid—that have less than 1,700 cubic meters per capita, the quantity below which one suffers from water stress Water withdrawals in Europe are growing slowly or not at all as households, industry, and agriculture become more water efficient [5].

The per capita use of water in households goes up slightly with the economic growth of the business as usual scenario between 1995 and 2025, but the amount of water used by industry per megawatt-hour goes down because of greater recycling and other efficiency improvements.

The amount of irrigated area stabilizes, and new technology increases the efficiency of irrigation systems so that there is also a decline in the amount of water used per hectare. Although water withdrawals go down, the pressure on water resources continues to be high in some areas because of the density of population and industrial activity. So, some river basins remain in the high stress category with sharp competition among industrial, domestic, and some agricultural users [5].

The biggest challenge in water resource management remains institutional. Political will must change decision-making to include all stakeholders, so that stakeholders have the power to manage their own resources. Public and private management of water can only be improved through greater accountability, transparency, and rule of law.

Making water available at low cost, or for free, does not provide the right incentive to users. Water services need to be priced at full cost for all users, which means all costs related to operation and maintenance and investment costs for at least domestic and industrial users. The basic water requirement needs to be affordable to all, but this can be done more effectively than by making all water available to all users at a price below cost [6].

Pricing water will provide an incentive for the private sector, large and small, domestic and international, to get involved. It has the potential to provide the dynamics—the funds for research and development, for instance that the sector lacks.

Service-oriented management focuses on making managers responsive to user needs. This requires the development of a mutual dependency—such as service for payment—that can take various forms, including service agreements. These provide a detailed description of services to be provided, payments in return for services, verification of service provision, consequences of failing to comply with agreements for both parties, and rules for arbitration of conflict.

The service needs and expectations of users will be influenced by the price they have to pay for those services, especially if they have to pay the full cost. Recognizing that services can be provided in different ways using different levels of technology at different levels of cost, service-oriented management thus requires a mechanism to ensure that the services needed by users are provided at the lowest possible cost.

Consultation processes, clear service relationships, transparent administration, and accountability mechanisms are among other conditions that have to be put in place for effective service-oriented management.

2. Land improvements – a constant necessity for the Romanian economy

Agriculture and deforestation are estimated to be responsible for one-third of greenhouse gas emissions, which are the main contributors to climate change. In turn, climate change affects agriculture more than any other sector, increasing risks of crop failures and livestock losses and threatening food security. The decline in crop yields could leave hundreds of millions without the ability to produce or purchase sufficient food [5].

Warming may also induce sudden shifts in regional weather patterns that would have severe consequences for water availability and flooding in some countries like Romania. While all countries will be affected, the developing regions will suffer earliest and most because their agriculture is the most climate/sensitive of all economic sectors.

Delay in addressing climate change could prove tremendously costly, while efforts to mitigate may be less expensive than commonly feared. Costs assessments argue that ignoring climate change will ultimately undermine Romanian economic growth [2]. If action does not start now, the country may face far higher costs later.

Agriculture was and is considered a strategic sector of the Romanian economy, which is why it is expected that it makes a greater contribution to the national gross added value [2].

The vulnerability of Romanian agriculture to environmental factors is shown in the following table:
Taking as reference the year 2004 (considered a good year in terms of environmental conditions for agriculture) and 2007 (considered a bad year due mainly to drought and floods) we clearly observe two peaks in the percentage of agriculture, forestry and fisheries in the total added value: 2004 as a high peak and 2007 as the low peak.

In 2004 (considered a good year for agriculture in terms of environmental conditions), the percentage of employment in agriculture, forestry and fisheries has decreased, while the percentage held by the agriculture, forestry and fisheries in the total gross added value increased.

The two peaks in the percentage of agriculture, forestry and fisheries in the total added value (2004 as a high peak and 2007 as the low peak)

One of the most important factors leading to increased vulnerability of Romanian agriculture to environmental factors and to competition from imported food products is the low volume of new investments [1].

However, the lack of new investments land improvements or rehabilitation of existing ones in agriculture affect its power of producing gross added value and makes it vulnerable to the severe weather conditions from the recent years [4].

Changes in climate patterns are already observed in some regions of Romania. Average rainfall has fallen in the country with droughts in the last ten years that resulted in important economic damages.

The soil’s ability to regenerate and improve fertility is the best chance offered by nature to humanity’s food security and to the continued practice of modern agriculture.

Regeneration and fertility restoration of this limited resource (the qualitative aspect of the land) together with the rational use of agricultural areas (quantitative aspect) demand continuous increase in the volume of investments in the land. As a result, soil fertility can not be simply a "gift of nature" because man can no longer rely solely on its natural fertility.

The soil becomes the product of labor and economic fertility is transformed into an important element of the agriculture capital. As a modern item of fixed capital it is subject to physical wear with all the corresponding consequences [1].

Soil degradation due to both the effects of natural hazards and to those of human action creates economic risk and uncertainty in all human activities, especially in agriculture. All land improvements contribute to land growth and enabling cause increased production capacity and increase of raw material basis, in one of the most vital economic areas - agriculture.

We believe that economic role held by agricultural activities and improvements is that of creating favorable conditions for production, similar to those offered by nature.

As a result of land improvement works not only is the natural fertility restored to the soil (by irrigation for example - the most important works that directly affect agricultural production) but significant increases in crop yield are also attained, yields become stable which allows the practice of modern and effective animal husbandry.

Mainly, the economic benefits of agriculture pursued by land improvement works are:
A. Increasing and stabilizing crop yield;
B. Protecting the existing agricultural area and even increasing it by farming new areas with improved fertility.
It is necessary to point out that land improvement activity has a long and rich tradition in Romania because of the importance given to this domain in our country.

We bring to your attention that, for example, the first irrigation plan was developed from 1865 - 1872 by the Italian engineer Gioia who proposed a diversion of the Danube River at Turnu Severin in order to transport water to the irrigation channels in Galati.

In addition to the requirements imposed by natural conditions (increase of the effects of environmental pollution, climatic excesses - droughts and other climate-related issues - and relief issues) that have a significant impact on the stability of agricultural production and food security for the population, there are numerous other grounds that claimed the restructuring and development of the land improvements through new investments in Romania, among which we may mention the following:

- Appreciable areas, set in almost all counties, which have already developed infrastructure for land improvements;
- Experience gained in the design, implementation and operation of facilities for land improvement, which was the basis for setting up medium and high professional education in this domain;
- Land improvements have generated over the years of operation, a substantial number of jobs in agriculture and rural areas;
- Last but not least, the long land improvement activity has created conditions for the existence of local producers of specific equipment and conditions for stimulating the demand of agricultural machinery, once a reliable source of supply was in place.

3. The effects of reform process on the Covurlui Plateau irrigation

With EU accession, Romania must comply with policies and directives related to agriculture and rural development, and adapt his own legislation and agricultural policy.

Although the agricultural policies of European states have always directed significant funding for land improvement and especially for irrigated agriculture, the CAP do not provides a chapter specific guidelines and measures for improvements in land in general or in particular for irrigation. But these activities are included in the CAP, in the chapters which aims to transform agriculture into a more competitive sector by strengthening the status of farms as a result of decentralization of decision-making process from the farm and state institutions to support implementation of programs. Also, land improvement activities are found in EU policies and directives seeking aimed at rural development in line with the environmental protection [8].

According to EU policies and directives, Romania oriented his own has directed its policy toward farms and various forms of their association, as the main beneficiaries of state aid for agriculture and hence for irrigation, implement policies to charge the full cost of water services, empower communities to select their own level of water services, continue the trend towards transferring management of water systems to water users, create governments and the private sector form effective public-private partnerships and develop a service oriented approach to water management, accountable to users.

In the context of conditioning their aid application of different standards that aid in environmental protection, food safety, animal and plant health and good treatment of animals end requirements relating to the maintenance of all areas of agricultural land in good condition in terms of agricultural and environmental factors, emphasize that land improvement and irrigation in particular, become instruments for the implementation of CAP and modeling mentality of owners of small farms, regarding the importance of associating in order to achieve agricultural production.

The CAP indicate that EU member states shall ensure by 2010 an adequate contribution of the water uses, disaggregated into least industry, households and agriculture, to the recovery of the costs of water services, based on the economic effects of the recovery as well as the geographic and climatic conditions of the region or regions affected. WTO uses the term region to define European water management policy does not use the term country nor the county because of spatial placement of vital resource called Water. [11] Therefore all the water resource projects must be managed from the region or regions affected.

According to EU regional policies and directives Romania must:

- recognize the need to cooperate as scarcity in regional basins increases and make binding agreements on how to share the resources of rivers that cross national boundaries;
- be prepared to adopt comprehensive approaches to land and water management;
- get to a better understanding and eventually to deeper cooperation over regional waters.

The accession to EU agricultural structures demands the radical reform of the actual Romanian agriculture structure and of the rural communities, fact that is proved as be difficult, slow and contradictory, a stabilization economical-social on the long term of the national economic system and of his subsystems, a constant improvement of the contest area and of the existent infrastructure of the rural communities [7].

By 2010, European Union member states must ensure that water pricing policies provide adequate incentives for users to use water resources efficiently and that the various economic sectors contribute to the recovery of the costs of water services including those relating to the environment and resources.

This cost recovery rule is expected to impact particularly irrigated agriculture, where users have not paid the full costs of water supply.

For this reason the land improvement sector it is subject to economic hardship and is expected that
agricultural enterprises will avoid using irrigation water if the price of water will not be subsidized.

The reality of the Romanian agricultural land improvement sector in general and of the Covurlui Plateau agricultural land improvement, in particular, shows the existence of a huge irrigation system, built 50-60 years ago, that today proves totally ineffective mainly because of high cost of water.

Irrigation development began in late 1945, but has become widespread only in the period 1970-1989, when is began building large irrigation pumping. The motivation for such initiatives has been mainly political, aiming at, first, the independence of the country's food source and ensuring that export products.

The motivation for such initiatives has been mainly political, aiming primarily to ensure the independence of the country's food and a source of export products to ensure the currency needs of the moment.

Most systems (from an area of 2.7 million hectares) have been equipped with sprinklers watering plants with manual removal. These systems were designed mainly for irrigation of maize, wheat, sunflower, sugar beet, rice and vegetables.

Most irrigated lands are located on three terraces, the height from the water source. Thus, in some cases, irrigation systems were designed at a height of 200 m from the water source, with up to 10 water pumping stations.

Today, these facilities are considered inefficient especially those on the terraces at a height greater than 70m, because the energy consumption required to climb up the water soaked field. Approximately 38% of the total area equipped for irrigation is at heights over 75 m. The cost of surface application of irrigation systems using the SPP’s and buried pipelines are high and, until 1989, the government hid the extent of subsidies (mainly electricity) in order to maintain irrigation services. After this time, the government already has not been able to provide the necessary funds for infrastructure maintenance works and therefore, irrigation systems have gradually deteriorated.

Since 1990, the Romanian government has instituted reforms that have had a serious impact on agricultural production of which nr.181/1991 Act, which regulated the return of land to former owners as had the main effect [8].

We conclude that, especially for irrigation, land restitution and the phenomenon of fragmentation inherent in them has led to the quasi-impossibility of organizing and managing water distribution. While in the past, large areas of land could be irrigated on the basis of simple graphs, land restitution has led to remarkable increase in the number of land owners on the site of the old large farms. The result was that irrigation infrastructure has never been located in proportion to the different types of farmers. Thus, an irrigable area of 1.5 million hectares, 532,000 hectares (35%) are managed by individual farmers and 979,000 acres are managed on farms with legal status. As a result 42% of the irrigable area is concentrated in the form of a number of 1295 companies with an average size of 488 ha. The agricultural companies manage a percentage of only 16% of the irrigable area [9].

As a result Romanian government has not started any new investments or ended the old investments started before 1989. Rehabilitation of old irrigation systems has become priority number one, but not in their entirety but in part, depending on their economic viability. Economic efficiency of the systems has been defined in terms of energy consumption required for water headrace and usability of systems, knowing that, on the one hand, there are years when demand for irrigation water greatly decreases or is almost zero, and on the other hand, there are a large number of subsistence farms wich renounces of use irrigation because they lack financial resources.

Covurlui Basin Irrigation System from Galati County was designed to provide a source of water obtained by building an artificial lake and the Suhurlui Dam. Suhurlui Dam construction began in 1975 and was a project characterized by a high volume of work. Lake had to have an area of 1,000 hectares and a depth of 50 meters, providing irrigation to 60,000 hectares of agricultural land. The huge amount of water, brought up here from the Danube had to be restrained by a barrage of 60 million cubic meters of earth. For soil transportation and dam construction were brought over a thousand machines, but as the volume of work was very high, was built a local railway also.

Work on the dam were abandoned two years before completion. In 1992 it had to be put into operation of the irrigation system on 60,000 ha Covurlui Terrace.Two years earlier, in 1990, the government closed the site at the time. At 17 years of abandonment of work thousands of hectares were left uncultivated because of the drought and they can not be recovered for one of the most important centers of the country's cereal because of destruction of the irrigation system.

In year 2004 about 25,000 hectares were left uncultivated, and in year 2006 remained uncultivated 43.000ha. Teoretic, surface irrigation system covers 135,000 hectares.

At this point in time, works only masterfully channel Lunca that carries water drawn from the Danube, and Vanatori pumping station which was the largest construction of this type in Europe and function as the irrigation system on an area of 73,000 hectares. Agricultural areas in the dry zone, such as the terrace Covurlui remained uncovered after abandoning investments and destruction of facilities.

Considering the situation above we believe that the removal of government subsidies for irrigation has led to a sharp decrease in irrigated area and the income derived from agricultural activity.

In the very near future, because of the difficulty of determining all social and environmental impacts caused by land improvement, on the one hand, and determining the weight of all profits obtained through the work of land reclamation, recovery of the costs will not be possible in Romania.
Because the owners of farms will have to pay the real cost of irrigation water and that energy price increases, which can greatly affect the short and medium term Irrigation sector, Romania will have to negotiate with the EU subsidies for irrigation, starting an adequate point of view of both economic and social terms but also environmental factors. It is true that this attitude will postpone full recovery of costs but should take into account the fact that all European countries where there are serious restrictions in terms of water, the public sector is the one who pays the real price land improvements, particularly the Irrigation (see Spain, France, etc.). We believe that we cannot take full account of the principle of cost recovery from the direction of Irrigation beneficiaries (farmers and their associations), so long as the alternative would be the destruction of Irrigation and fall of agricultural activity in Romania.

4. Conclusions

Although it is considered a country with great potential in agriculture, Romania became increasingly dependent on agricultural imports, as Romanian agriculture fails to keep pace with increasing demand for food and cannot face foreign competition. Taking as reference years those considered the best years in terms of environmental conditions for agriculture in the analyzed period and those considered unfavorable (drought and/or flood), we see clearly how they respectively meet the two extremes of the percentages for agriculture in the total added value (the high and the low extremes). The lack of new investments land improvements or rehabilitation of existing ones in agriculture affect its power of producing gross added value and makes it vulnerable to the severe weather conditions from the recent years. For the reasons outlined above for this such important branch of the Romanian economy we support the vital need for strengthening the pace of land improvements through new investments or rehabilitation of the existing fixed capital but also through and increase of the efficiency of such works. The CAP indicate that EU member states shall ensure by 2010 an adequate contribution of the water uses, disaggregated into least industry, households and agriculture, to the recovery of the costs of water services, based on the economic effects of the recovery as well as the geographic and climatic conditions of the region or regions affected. Therefore all the water use projects must be managed from the region or regions affected, including land improvements.

According to EU regional policies and directives, Romania recognize the need to cooperate as scarcity in regional basins increases and make binding agreements on how to share the resources of rivers that cross national boundaries and get to a better understanding and eventually to deeper cooperation over regional waters.

Considering the real issues of land improvement sector in Romania, in particular, and the irrigation sector Covurlui Basin, in particular, is necessary to specify the following conclusions:

- because of the difficulty of determining all social and environmental impacts caused by land improvement, on the one hand, and determining the weight of all profits obtained through the work of land reclamation, recovery of the costs will not be possible in Romania in the very near future;
- it can not take full account of the principle of cost recovery from the direction of Irrigation beneficiaries (farmers and their associations), so long as the alternative would be the destruction of Irrigation and fall of agricultural activity in Romania.

References: