

Accounting and Fiscal Agriculture Incentives Sustainability in Climate Change Conditions

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Abstract – The scope of the paper is to analyze the sustainability in irrigation field of fiscal incentives established by Governments in agricultural sector and the manner fiscal incentives are registered, especially the reduced VAT in Romanian firm accounting system for investments in irrigation field. The paper studies the impact on good-governance and the sustainability on the frame of climate change conditions and water resources management. The main results show fiscal incentives for specific assets don't imply difficulty in accounting system and the impact of good-governance on water management or on the activity of the plant is significant. **Keywords:** eco-conflict, water resource management, climate change, sustainability, investment, fiscal incentives, accounting.

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I. INTRODUCTION

Nowadays increasing climate challenges are putting resources management (Figure 1), especially water sector, under a great pressure and vulnerability (a new eco-conflict): the limitation of water resources availability, uncertainty in climate conditions, precipitation and temperature modification, provision in water security, flood resilience risk, the quickly overgrowing population and health risk, food security due to unsafe water sources, droughts condition, environmental and soil degradation, wastage in using the clean water, increasing poor rainfall, depletion of ground water resources, global warming, increasing greenhouse gas concentration emission [5].

Water resource management (WRM) may respond to such questions with specific tools: flood management (flood studies, flood mapping, real-time flood forecasting, flood protection, flood risk, flood planning), rainfall modelling, drainage design (highway drainage design, rail drainage design, airfield drainage design, pipeline drainage design, river diversion), investments in bridges, channels,

embankments, spillways, culvert design and analysis, environmental hydrology assessment, surface water management (surface water impact investment, surface water planning), groundwater management (groundwater flow, investigation and implementation design, hydro-geophysical programs, groundwater resource assessment, dewatering system, contaminated sites investigation, geo-chemical analysis, surface-groundwater interaction, groundwater monitoring design), and finally but not least, investment in irrigation equipment for smart agriculture.

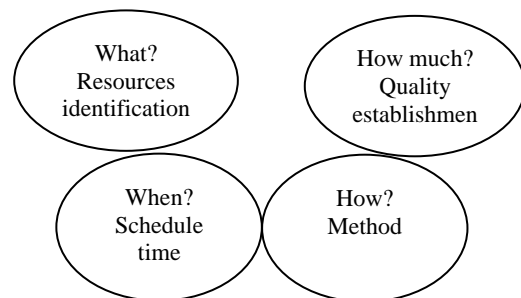


Figure 1. Resources Management

The efficiency in water resources management (Figure 2) plays and important role to determine the quality of mankind life.

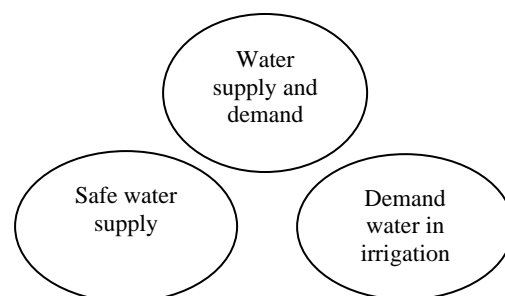


Figure 2. Water Resources Management (WRM)

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The quantity and quality of water used depends on the sustainability, efficiency and equitability of WRM [11].

Sustainability concept can be divided into three important categories:

- Rural income and plant income (they reflect the economic sustainability)
- Rural development and labor (social sustainability)
- Biodiversity, water management, nutrients and pesticides use (environmental sustainability)

In the frame of European Union, some regulation (such as Directive 60/2000) set up criteria for WRM (cost recovery and polluter pay principles).

Water resources management needs to be defined and explained taking into consideration the allocation of scarce water resource and the implication of technical, economic, and environmental efficiency of water use in generally and in irrigation especially within a region or river basin.

Irrigation systems are very useful for increasing the crop and to ensure a certain agriculture result from one year to another, but also with great implication on food security for population and for export. But investments in irrigation equipment are very expensive and the cost of using them are also very high (water and energy consumes). Irrigation water management begin to gain a central role in present and future [1].

The main scope of the paper is to analyze the sustainability of fiscal incentives in agricultural sector, especially in irrigation field. Specific themes analyzed are related to the fiscal incentives that are established by Governments in agricultural sector. Also, it relies the manner these fiscal incentives are registered, especially the reduced VAT in Romanian firm accounting system for specific investments, more the investments in irrigation field. Finally, the paper studies the results of these decisions and actions in good-governance and last but not least the sustainability on the frame of climate change conditions and water resources management.

II. METODOLOGY

From methodological point of view, the analysis of the incentives sustainability in climate change condition was based on information from: The National Land Improvement Agency (NLIA), The Office for Regulation of the Organizations of Land Meliorations within the Ministry of Agriculture, Forestry and Rural Development, the Ministry of Environment, European Union Committee, as well as a series of governmental reports for the subject approached. As methodological instruments there are used the analysis, comparisons and synthesis of available information.

III. ECONOMIC INCENTIVES IN WRM

Because of many challenges such as: increasing world population, growing water scarcity and water supply, increasing water demand and rising water cost, water is an economic good and to improve water use efficiency in irrigated agriculture area becomes mandatory [2]. The efficiency of different economic incentives (charges and taxes reduction) can be explain using concepts as marginal benefit (demand), marginal cost (supply), and marginal damage cost (damage for incremental unit of one pollutant).

The water in irrigation consume surpass 60% from global water use. Thus, water conservation in agriculture is considered a new 'source' of water [3].

In the following we provides short description for theoretical economic incentives in irrigation field.

1. Users' Pay Principle (UPP) is referring to the fact that who use scarce resource must pay [4].

Irrigation water pricing may include transfer of water rights (technical efficiency), may exclude water rights (allocative/economic efficiency based on opportunity cost of water), or may include environment cost (ecological/environmental efficiency and sustainability). Moreover, productivity of water varies highly, and so economic value does. On one hand, in agriculture, water irrigation may be considered as one input among others, thus charging depends on water quantity use, for change farmers' behavior, and even if it is influenced by the price elasticity of water (based more on marginal cost). On the other hand, irrigation water may be charged on the output (irrigation water in terms of output [6]), certain water fee for each unit of output produced (based more on marginal benefit).

2. Subsidies represents the difference between the sum farmers pay per unit of irrigation water and the marginal cost of supply [11]. Different types of subsidies might be settled such as research grants or payments to farmers, budgetary subsidies (e.g., grants or tax credits), provision of extension services, preference loans, and debt relief.

3. Tax incentives might be settled as preferential tax treatment (tax credits, exemption or deductions, tax benefits for investors, tax on water abstraction, tax on environmental damage through pollution – polluters pay principles and adverse effect [9], taxes on related inputs – energy required to use irrigation equipment and chemical fertilizer use)

Taxes on energy consumption and chemical fertilizer, tradable quotas, and subsidies for land retirement or water conserving agriculture practices, may be direct and indirect means for reducing water-related inputs and water use [7].

The optimal point (also called Pigovian tax) for environmental tax is the point where marginal cost of pollution abatement equals marginal damage cost. It is considered as one of the economic incentive tools for internalizing the externalities.

4. Quotas control water use (how much, where, when, by whom, for what purpose) [11], but might be sometimes rigid (use-it-or-lose-it) or difficult to set: fixed quota for groundwater pumping, allocation of water share in fixed amounts, allocation of fixed quota.

5. Ownership (water rights) is related to the right the user acquires for abstraction, diversion, and use of water: share of stream flow, water purchase rights.

Other examples of incentives are: rebates, grants and loan guarantees, cost share, rate discounts, interest-free loans, credits to bill, subsidized tests,

In fact, in practice incentives measures for improve efficiency in water use is very rare for the fear of losing competitive position in the world agriculture market [8].

Schmitz. and Sourell said that an efficient use of irrigation water is referring to the supply of irrigation water for farms just with as much water it is necessary to produce optimal yield, so neither water, nor production factors (land, labor, capital) is wasted [10]. Irrigation used in agriculture provided in 1999 about 40% of the total world's food supply but occupied only 17% of the arable area of the planet.

For 2020, some specialists predict that the demand for cereals will seriously grow up of around 40%, which may put a great pressure on water all over the world.

Proper incentives for farmers allow improve irrigation systems, crop mixes, proper following.

IV. ROMANIAN LEGAL FRAMEWORK ABOUT IRRIGATION AND ACCOUNTING

Romanian judicial framework regarding agriculture set incentives in these ways: fiscal incentives foresaw in Fiscal Code in regulations, Law no. 175/2018 and Low of Agricultural Cooperation (Law no. 566/2004) and reduced VAT rate by 9% for goods and services in water supply: delivery of irrigation water, draining services, centralized thermic energy production, transport and supply, electricity supply, natural gas supply as well as in agricultural irrigation, investment and supply. The following association form is accepted in Romania: agricultural companies or other agriculture association form (Law No. 36/1991), association or foundations (Government Ordinance 26/2000), agricultural cooperatives (Law No. 566/2004), and organization (federations) of land melioration (Law 138/2004), altered and completed.

The irrigation water users/ associations asked Romanian Government to accept no VAT for investments in infrastructure and land melioration (irrigation, drainage, fight against flood or soil erosion), for purchase and installation of scheduling equipment, but till this moment reduced VAT rate of 9% will apply only to water supply and services in irrigation agriculture.

Romanian Government program (Irrigation National Program, PNI) and policies on medium term run regarding agriculture and irrigation issues for 2018

and projection for 2019-2021 stipulate as major objectives to increase agricultural potential, to ensure food security, and to enhance the export in agriculture field. PNI has 41 new objectives and 9 of them have economic and technical indicators approved (total value, price moment, capacity, number of months).

Romanian accounting of water supply and services is illustrated below:

1. Irrigation equipment acquisition (VAT 19%)
 % = 404 "Supplier of non-current assets"

2131 "Plant and machinery"
 4426 "Input VAT"

2. Depreciation of irrigation equipment (in the end of the financial year)

6811 "Depreciation of non-current assets" = 2813 "Depreciation of plant and machinery, motor vehicles, animals and plantations"

3. Water supply and services for irrigation and reduced VAT (9%) (in the case of operating activity), 19% VAT for utilities

% = 401 "Suppliers"
 605 "Electricity, heating and water"
 4426 "Input VAT"

The technical and economic measures mentioned are directed also to develop irrigation systems (both to recover and repair existent infrastructure and also to extend it in order to reduce energy consumption and to rise water productivity) and to increase competitiveness of Romanian crop on European Single Market (increasing labor and land productivity and efficiency, enhancing quantity and quality of the crop, reducing production cost and water consumption).

V. RESULTS AND CONCLUSIONS

Water crises looks to become a fight between cities and farmers. According to literature and database accessed, the irrigation system is used in agriculture field most in Mediterranean European countries comparing North and East Europe Countries. The average of total water demanded for irrigation is 6,500 m³/ha/year from total quantity of water used in agriculture, around 73,000 million m³/year. The dimension of irrigated area influences the consumption of water.

In the beginning of new millennium is was notice that the rate of growth of the irrigated field decreased in several countries. In Greece for about 83% of total water is used in irrigation, in Italy for about 57%, in Spain for about 68% and in Portugal for about 52%. These results are in marked contrast with Northern and Eastern European Countries where the share of total water used for irrigation is less than 10%, on average. In USA, the agriculture uses 80% of water supply, in 2018, even if about 40% of farmers use advanced scientific methods that evaluate quantity of water needed for the high-value crops, determining

moment and surface to irrigate. The climate, the cultivated crop structure, the land quality, the area and the irrigation technique are influence factors for the volume of irrigation water use but also for the dimension of area under irrigation systems.

On one hand, economic measures are more efficient when they are used together to complete each other. Thus, economic incentive measures are policy instrument of decision-makers (government, suppliers and users). On the other hand, even if several economic incentive measures do not have a direct and immediate financial impact, they may determine the firms to be more motivated and more efficient. Moreover, in water sector reform is proper to delegate the responsibility towards the user group, of allocating and consumption of water, collecting and handling fees, or in purchasing needed equipment. Furthermore, it is also important regular monitoring and evaluation of irrigation cases at the region level or river basin level.

Studies have shown that subsidies are a popular means of pleasing smallholder farmers in most of the developed and developing countries, and the large or medium size landholders and the agribusiness sector are taking more advantage than the rural. Thus, it is recommended for developing countries to reduce subsidy and introduce economic incentive measures for recycling part of the revenue in order to compensate the smallholders for the adoption of sustainable WMR and common agriculture practices. Policy interventions depend on the level of hierarchy: at the farm level they are directed towards improving technical and economic efficiency (opportunity-cost, end-use efficiency), at the regional, sectoral and inter-sectoral levels they are directed towards improving economic and environmental efficiency (sustainable development).

Finally, in Romania incentives are very poor comparing with other countries where are up to 90% of the cost investment in completion of irrigation system, up to 50% of the cost for development of irrigation or of purchasing and installing equipment, up to 25% of the cost for upgrading, and so on.

Decision-makers must be careful in setting and integration technological, monetary measures and regulatory (economic incentives) in order to increase in both tangible and intangible investment, to develop the capacity of the users, to facilitate accounting for farmers, to increase water supplies finding water from new sources and strengthening the capacity for implementing economic incentive measures, and to improve the overall WRM for a good-governance. Because setting economic incentive measures is usually an inter-sectoral question, policy actions may be oriented towards sectoral, inter-sectoral, regional and economy level rather than only on water sector or irrigation sub-sector. The degree of implementation of economic incentives determine the success of decision-makers and the policies performances in WRM. The success to accurately account for quantity of water needed contributes directly to the success to

manage it sustainability. But competition over water resources limits continues and it is exacerbated by climate change conditions. A smart and innovative agriculture with technologies support, better water resource management, right practices and pricing policies, right incentives can reduce the vulnerability of agriculture to water supply constraints and strengthen long-term sustainability. In practice, these objectives are rather weak in developing countries, thus decision-makers in good-governance system should strengthen the present institutional system (regulation, institution structure), to promote regulated market, to increase trust in incentive measure, to facilitate accounting system for economic incentives in order to improve WRM, and also to increase the agriculture crop, the income of the farms and finally the economic development and living level. The main results obtained in this research show that the fiscal incentives for specific assets (irrigation installation) don't imply difficulty in accounting system. The impact of good-governance in water management field on the activity of the plant is significant.

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