

RESOURCES IN ECONOMY OR RESOURCE ECONOMICS: AN ISSUE WITH MULTIPLE SOLUTIONS

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Abstract

The prospects of natural resources' exhaustion were outlined decades ago. Since then the design of an economic rational that mirrors this physical reality fuelled restless research with patchy outcomes to be valued in policy making. Building on the case of agriculture as an economic sector that forwards the influence of natural resources to social structure there are revisited two basic economic concepts: production costs and economic value. This resulted in a reasoning that supports a paradigm shift to improve the understanding of how resource scarcity should be approached without losing the potential of economic transactions in delivering the optimum or at least rational use and management of natural resources. The proper use of concepts is highlighted in a matrix that takes in account economic level, ownership, criterion of use, economic categories and market tools. Straightforward methodology that expresses economic, social and moral values should be used to establish the main economic categories for natural resources.

Keywords

natural resource, production cost, economic value, agriculture

Introduction

According to the classic economic theory, the functioning of economies, at the macroeconomic level, where industries are differentiated by objective factors, there are needed three major categories of resources, namely nature, labour, and capital. Out of these, currently of high and special interest are the natural resources.

This focus grew firstly because of their importance in supporting the production processes, especially of the ones productive-integrative in nature, and secondly because of scarcity's emergence and its gradual increase for a mounting package of such resources.

The economies of developed countries have as common pattern the prevalence of the industrial sector. But, the industrial sector, wherever it is and regardless to its profile, content, and level of development, supposes, as basic condition, the availability of natural resources. Therefore, without these resources industries did not have been existed, either developed. To conclude, it could be stated that restraining the access to resources induces, as direct effect, the crisis of the entire industrial sector, sector that is of major importance for any developed economy.

1. Natural resources in the agricultural economy

Natural resources are highly diverse, to be found in almost all spaces of the Earth, but are highly differentiated in terms of reserves, availability, and accessibility. The resources that are of importance for agriculture are the ones that support living beings, plants and animals, and that influence certain production and labour processes. To be more specific, the natural resources that have a direct influence on the sector's productivity are: climate (temperature, rainfall, wind etc.), orography, renewable energy resources. The other categories of resources

could have also an indirect influence on agricultural activities, such as classic energy resources (coal, oil, natural gas), mineral resources (iron, granite, gold, silver etc.) and others. The influence of natural resources on the structure of agricultural production is inversely with the influence of scientific knowledge and technological development. In other words, higher the knowledge and technical endowment lower the dependence on natural resources. The inverted relation is also true.

Of special interest are the geographical resources, which compared with other resources, have the strongest influence on the plot size and further, on the social-economic structure of the sector. For instance, in field areas, where land slightly waves and the climate is favourable for agriculture, the process of land concentration in large and very large holdings is more obvious. Oppositely, by the increase of altitude, which goes along with higher energy of the relief, the size of agricultural holdings tends to decrease.

Referring to this relationship, Huntington (2012) made the following relevant notes that have the value of objective laws: "Drained soils and favourable climate tend to encourage the development of an agriculture based on large holdings and the emergence of a social structure comprising a class made up by a small number of large land owners and a numerous class of slave peasants or bondsmen who work on farms. Unfavourable conditions for large agricultural holdings might favour the emergence of a society of independent farmers. Briefly, in agrarian societies the social structure depends on geography."

2. Production cost versus economic value

At microeconomic level the resources are represented by *production factors*. Accordingly their economic impact should be found as *production costs*. But costs comprise, objectively, only the material and human efforts needed in production and natural factors such as water from rainfall, air temperature, winds, and solar light are not the result of specific human effort. That is why in the costs of agricultural products there are not to be found yet a large part of the natural factors that participated to their making. We mention "yet" because these are in a relative abundance. The use of resources, regardless to their nature and assessment reference, inexorably leads to their exhaustion. Even the solar energy, acknowledged as the most abundant and safe of natural resources may, according to experts in the field, decrease in intensity.

The fast increase of the demand for natural factors generates multiple approaches on the behalf of public policies. Firstly, it is envisaged the need of precaution and effectiveness in the use and management of existing resources. Secondly, there are assessed the possibilities to increase the exploitation degree of known resources, but also to intensify the exploration of new reserves. Thirdly, it is accepted the idea that by knowledge viably solutions might be found for the replacement of natural resources needed in production processes with artificial ones, which are made by humans.

For this issue of great relevance is the irrigation water that could replace the rainfall water. In these conditions, for the natural factor rainfall water it could be assigned a cost by a judgement that is similar with the one applied for irrigation water. The cost interpreted in this way, which is possible from methodological point of view, creates multiple responsibilities on the behalf of resource users and consumers, but also supplementary financial sources to support processes resulting in novel resources.

Nonetheless, the above mentioned method cannot be applied to all natural factors. It is possible only in the case of factors that could be made by humans using their own resources. For the factors that cannot be replicated or can be hardly controlled by humans the economic theory does not yet supplied a viable solution with a scientific rational, which allow the calculation of production costs. In these conditions, for those factors, the *economic value* is

accepted as replacement for production costs. Hence, the economic value could have the same functions as the production cost providing a credible and operational milestone for the determination of *market price* in case those resources are the subject of economic transactions.

Technically the economic value could be determined using statistic-economic formulas and calculations that are more or less accepted. In the economic theory for any natural factor there is no accepted methodology of general relevance. Moreover, there are diverging opinions regarding the need or opportunity to establish the value of natural resources. Both reasons and objections are numerous. It is important to keep in mind that the speeding up of resources use and consequently the approach of their exhaustion will objectively increase the interest in human made factors that replace by their effect the natural factors.

The economic judgement claims the existence of the two economic categories mentioned before that both support production opportunity decisions, although they are underpinned by different reasoning:

- Economic value: is of relevance for those factors that could be included in the category of “nature’s gifts” and the efforts needed for their production cannot be measured, fact that minimizes the responsibility of their efficient use and management;
- Production cost: is accepted for the factors with similar functions in production as the natural factors, excepting the fact that they are the results of human productive activity.

The economic value and the production cost should be judged by considering the opportunity of their determination, calculation methodologies, and valuation and understanding of the results.

3. Opportunity of determining economic categories for natural resources

The opportunity of determining the above discussed categories is a subject that has a doctrinaire nature with interpretations and attitudes that are different by categories and types of factors and resources. For instance, the production costs were and remained needed milestones with unanimous acceptance for the determination of prices for products and services, as direct results of labour processes controlled by humans. Therewith production costs are considered economic instruments that are specific for activities to be found within the scope of microeconomics.

The economic value could be accepted, but not in imperative approaches, as important tool for the price determination in case of natural resources. In fact, the economic value of natural resources was and remained, yet, controversial from the point of view of its opportunity. For instance, for almost all of the period then the classical economic theory were used and then the abundance of resources, even relative, was an undisputed fact, the issue of natural resources’ economic value was of no relevance for scientific inquiry, doctrinaire debate or public decision. Later on, along with the intensification of the industrial processes the use of natural factors increased, the perspective of their exhaustion gradually glimpsed out within shorter or longer periods according to the size of both reserves and demand.

In these novel conditions the opinions regarding the need to calculate the economic value gained more and more supporters. According to such opinions the economic value is a parameter that needs to be determined, firstly, because it helps, supports and incentives the normal functioning of the capitalist market, and secondly, because the economic policies could make operational tools that prevent the crises determined by the exhaustion of natural resources’ reserves. As working tool the economic value is operational at both macro and

micro level. In the first case, it is operational by general or sector economic policies, and in the second by management decisions of agricultural social-economic entities.

4. Logic and rational knowledge applied to natural resource economics

Methodologically, the knowledge of the economic theory could provide solutions for the determination of the two parameters presented previously by using statistic-economic calculations that have a rigorous scientific rationale and a high degree of comprehension and expression.

The appreciation and interpretation of economic value and production costs might be logic or rational. Using a metaphor, the difference between logic and rational could be explained by the role of computer compared with the act of knowledge. "The computer, by all the operations performed by it is logic, but not rational."

The logical knowledge is focusing on the process of exact thinking. By definition it excludes uncertainty, approximation or relative of any kind as components of the object that is studied. A classic example of logical thinking is to highlight consumption as it is reflected by production costs.

Rational knowledge is referring to the products of thought that could be inferred from the formulas used in exact sciences. In the rational knowledge there are accepted the values resulting from wise, balanced, moral, legal judgements, namely from those sides of human activity where rigorous, mathematic, and statistic assessment can hardly or not at all applied. For this case the economic value is representative then it accepted by economic policies as milestone-tool in the calculation of natural resources' prices.

For instance, within the land market the economic value of land could be a logical milestone, but also a rational one in calculation the price for selling-purchasing of agricultural land, but also for the calculation of other economic categories that are specific to this market such as lease, dividends, rent and especially for the areas owned by the state that are assigned by concessions to the private sector for exploitation.

As an objective process it could be noticed that the economic value will gain new valences in the economic theory and practice along with the deepening of the current crisis of the natural resources. At that point the economic value will be accepted as substitute for production costs from both points of view of the economic theory and of the legal, decision making process.

5. The case of agricultural land in Romania

In present Romania the economic value of land is not yet a legal rule, although the land market is highly functional. The explanation of this phenomenon is that all economic categories that are specific to the land market are apparently the exclusive result of the interplay between the demand and supply of land. We specify "apparently" because between the demand and supply of land there is no perfect equilibrium. Consequently, all the previously mentioned economic categories are distorted for objective reasons. For instance, if the supply is superior compared with the demand, phenomenon that was the case during all the period of transition, until 2002-2003, all the economic categories of the land market were underestimations.

After the time-threshold mentioned above and on the background of economic growth and approaching of the moment of Romania's integration in the EU the demand for land entered an accelerated upward trajectory. Unprecedented in the Romanian agriculture was the fact that a significant impulse for the land demand arrived on the behalf of foreign investors. Due to higher level of knowledge, information, and capitalization these investors occupied winning positions, outrunning domestic competitors.

Due to the liberalization of access for foreign investors on the agricultural and forestry land market in a very short period after Romania's integration in EU the proportion of land purchased, sublicensed, or leased by them raised to levels that worried a great part of the Romanian society. Also as an effect of the increased interest of the foreign capital in Romanian agriculture the prices of lands and along with them the lease followed an accelerated upward trajectory especially after 2012 then the economy expressed visible sign of outgoing from the world economic crisis started in 2008.

A hectare of agricultural land in recognized agricultural areas such as Ialomita (Urziceni), Calarasi (Valcele, Dor-Marunt, Lehliu) or Giurgiu (Calugareni, Hotarele) cannot be purchased below 5000 euro, resulting in a period of recovering the investment that reaches 25 years. Very few experts of agricultural economy anticipated the effects of Romania's integration in EU in terms of the speed and magnitude of these phenomena. In the first years of integration the price of a hectare in the same areas ranged between 1000 and 2000 euro, the period of investment recovery being of only 5 years. It was an unrepeatable situation of maximum importance for the domestic farmers.

6. Natural resources and ownership

From the point of view of property regime most of the natural resources are public goods, some of them being private goods. They are public goods on the ground of constitutional provisions. In these conditions the natural resources should satisfy a public interest without facilities or restrains for certain groups or persons. Thus their use is general in the sense that nobody has restricted access and nobody is allowed to prevent by no means the access of another user recognised by the law.

Being public goods in the macroeconomic framework the responsibility regards economic policies in general. These policies should substantiate the decisions of social-economic structures having responsibilities in their use and management. Assigning natural resources for exploitation and use by the state to the private sector is made based on a fee, fee that generates budgetary revenues. This fee is designated with the notion of *royalty*.

7. Economic theory matrix regarding natural resources

The economic theory regarding the natural resources could be thought in a synthetic approach according to the matrix presented in table 1.

The important role of resources for the industrialization process and accordingly for the modernization of all developed economies of the world is well documented. Regarding the natural resources the economic judgement should be differentiated on two levels: macro, respectively microeconomic.

At *macroeconomic* level, all resources of the nature that are used become production resources in the regime of public goods. The use of these resources should be grounded on rational knowledge. The market of these resources for a normal functioning claims, as compulsory condition, to set the price and the royalty as major budgetary fee tool in accordance with the economic value, parameter that could replace the production cost by the functions fulfilled in the economic theory and practice.

Table 1 Economic theory matrix regarding natural resources

Economic level	Nature of approach	Ownership	Criterion of use	Economic categories	Market actions and tools
Macroeconomic	Production resources	Public	Rational	Economic value	Concession: royalty

Economic level	Nature of approach	Ownership	Criterion of use	Economic categories	Market actions and tools
				Price	Rental: rent
Microeconomic	Production factors	Private	Optimum	Production cost Price	Selling-purchasing: price Lease: lease Concession: royalty Rental: rent

Source: author

At *microeconomic* level, natural resources are private goods and their use pursues the economic optimum. Natural resources are considered production factors fact that allows their inclusion as components of production cost. Hence all economic tools that are specific to stakeholders of the natural factors market, price for selling-purchasing, rent for rental and royalty for the concession of state's private goods are grounded on production costs.

Conclusions

Resuming, it could be stressed that the economic policies that envisage the use of natural resources should resolve based on a scientific ground and with high priority the following issues of maximum importance:

- i. legal approval of methodologies to be applied for the calculation of the economic value for the natural resources that have the regime of public goods;
- ii. definition and design of methodologies according to the degree they respect economic, social, moral, and political rationality;
- iii. sizing of tools on the market of natural resources – royalty, rent, lease, and price – in accordance with their economic value or production cost in order to impose their use by the rule of economic optimum and careful management that avoid their rapid exhaustion.

References

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