

SELECTED INSTRUMENTS OF ENVIRONMENTAL PROTECTION IN THE CONTEXT OF CONTEMPORARY PARADIGMS OF EU AGRICULTURE

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Abstract. The existence of many possible ecological policy instruments and numerous paradigms in the approach to agriculture in Europe prompts us to analyse the intersection of these two. The purpose of this study is, therefore, to present the selected instruments for environmental protection and to assess their impact on the economic condition of farms in the context of the European Union's agriculture paradigms. It has been achieved using the method of analysis of the source texts (desk research). The paper finds necessary to harmoniously expand fiscal/financial instruments of environmental protection, as well as to establish administrative regulations, taking into account the assessment criteria from the perspective of the state, the sector, as well as social environment. We also underline that decision-makers shaping the instruments of agricultural policy as well as climate and environmental policies for rural areas, should precisely identify groups of related instruments of a typically tax, subsidy or financial nature, taking into account the economic size or production type of farms. This objective may be served by more precisely determined eligibility criteria as well as by the promotion of certain types of instruments (e.g. preferential loans and subsidies, or subsidies under Rural Development Programmes, RDPs), which have not been widely disseminated to entities that could potentially benefit from them so far.

Key words: instruments of environmental protection, paradigms of agriculture, ecological fiscal reform, European Union, desk research

JEL code: H23, O13, Q15, Q50, Q58

Introduction

The active protection of the planet's natural resources is becoming an increasingly pressing problem. Environmental pollution, however, is not only a matter of ecology or public health, but also – from an economic point of view – the one of an inefficient use of resources. What is more, it seems that environmental external costs will increasingly affect the society, leading – considering also the ineffectiveness of hitherto policies that do not encourage economical use of natural resources – to the search for effective solutions in the field of economics. In this context it should also be remembered that an especially sensitive area with a significant impact on the environment is agriculture.

Resulting from the aforementioned developments, the evolution of ecological policies across the world leads to the search for solutions that at the earliest possible stage would lead to reduction in the use of natural resources as well as to reduction of the amount of pollutants discharged or that would prevent disturbances in the natural environment in general. Therefore, it seems necessary, in the current environmental and technological conditions, to use, inter alia, also financial instruments in environmental protection. European Union has recommended their implementation since 1992, but to this day No homogeneous policy has been created at the EU level. However, some actions took place in individual member states, which taxed selected activities and products with negative impact on the environment.

Of course, one cannot forget that the implementation of pro-ecological solutions involves not only hopes, but also fears. In the case of agriculture, the latter mainly concern the increase of operating costs, and thus the decline of competitiveness on both domestic and international markets. The existence of many possible ecological policy instruments and numerous paradigms in the approach to agriculture in Europe prompts us to analyse the intersection of these two categories. This is also

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the purpose of this study: presentation of selected instruments for environmental protection and assessment of their impact on the economic condition of farms in the context of the European Union's agriculture paradigms. It will be achieved using the method of analysis of the source texts (desk research).

The remainder of this article is organised as follows: in the next section we present our findings, beginning with the discussion of selected environmental protection instruments and their application in EU countries, followed by the sub-section on modern paradigms/concepts of agriculture in the context of environmental protection, presenting also our analysis of the interdependence of the previously discussed instruments and paradigms. The paper is concluded with some policy proposals and recommendations.

Research results and discussion

1. Selected environmental protection instruments and their application in the EU countries

Instruments for environmental protection can be broadly divided into two categories: direct and indirect regulations. The aforementioned includes legal and administrative instruments (including regulations on greening, cross-compliance, eligibility criteria for subsidies under the Common Agricultural Policy, CAP), while in the group of indirect regulations we can distinguish economic instruments (including subsidies) and financial instruments. Economic instruments include: eco-taxes and fees, financial incentives supporting law enforcement (financial penalties due to improper use of the environment), deposit systems and deposits, creation of a market for emission allowances (permits negotiable, interventions in market mechanisms), environmental insurance or subsidies (including loans, exemptions, tax breaks and preferential loan rules). On the other hand, financial instruments include: loans (including loans for pro-ecological investments), guarantees and sureties for loans as well as venture capital funds.

As we can see, the range of instruments for environmental protection therefore extends from a wide catalogue of administrative interpretations, through a catalogue of fees and impulse stimuli (penalties), deposit systems and market creation mechanisms, to subsidies, concessions and loans.

However, in the set of instruments discussed above, particular attention should be paid to fiscal instruments that could play a special role in relation to other instruments—above all, an autonomous role in shaping the financial base of the state's environmental policy. Here, the tax system is one of the crucial tools for determining the behaviour of entrepreneurs applied by the state administration. Through this system, governments have the option of awarding certain solutions and limiting others, stimulating specific behaviours or deciding on the direction of economic development. On a practical level, the main difference between these economic instruments and direct regulations is that the former do not indicate the desired polluters' behaviour who retain a certain freedom of decision to modify their behaviour according to their preferences. Economic instruments occupy a special place among all environmental protection measures – they are an indirect tool of influence on economic entities, affecting their financial results. They cover all polluters, in accordance with the principle that every user of the environment (business entity) should pay full, and thus also external, costs of their activities.

Examples of fiscal solutions applied in environmental protection

Country	Poland	Belgium	Finland	France	Greece	Spain	Norway	Romania	Ukraine	United Kingdom
Solution applied										
investments in the area of environmental protection		X		X	X	X				
investments in new technological lines	X				X					X
investments in new products					X					
recycling or recovery of packaging		X			X					
investments in ecological car fleet		X								X
increasing eco-efficiency of buildings	X	X			X					
for companies using renewable energy sources	X	X	X			X				X
other incentives							X		X	

Source: authors' elaboration based on Przegląd... (2011)

Table 1 presents examples of fiscal instruments that have been implemented in environmental protection in selected European countries. Previous experience of EU countries in using fiscal/tax instruments as an ecological policy tool is difficult to assess and compare due to different interpretations of the reform process by different countries. Moreover, most economic instruments operate outside the mechanism of the so-called ecological fiscal reform. Examples of specific solutions used in several European Union member states are presented in Table 2.

**Tax instruments in the area of environmental protection
 in selected EU countries**

Country	Solution applied
Tax incentives for innovations and investments in the area of environmental protection	
Spain	tax relief amounting to 8 % of the value of investments in fixed assets for environmental protection (e.g. devices reducing noise, air pollution, pollution of surface water, groundwater and marine waters, as well as devices for reducing, recovering or neutralizing industrial residues)
France	tax relief for research and development related to investments or implementation of environmental innovations, amounting to 30 % of expenses incurred by existing enterprises and 35 %-40 % for new companies; this relief consists in deducting the amounts deducted from the income tax of the taxpayer investing in research and development in the course of 3 consecutive tax years
Belgium	tax relief amounting to 80 % of the expenditure invested in the acquisition of a patent; this relief can be granted to companies regardless of the type of legal form as well as sector in which they operate
Greece	reduction of the tax base by 50 % of the value of expenses incurred by enterprises to reduce the environmental impact of their operations
Tax incentives for innovations and investments in new technological lines in the field of environmental protection	
Poland	<ul style="list-style-type: none"> • deduction from the tax base up to 50 % of the amount spent on the acquisition of new technology • write-offs for the innovation fund created by R&D centre (write-off not greater than 20 % of R&D centre revenues) and exemption from property tax, agricultural and forest tax
United Kingdom	increased rates of tax amortization for investments in selected "green" technologies - energy-saving devices and installations (including water purifiers or air conditioners)
Greece	subsidies for new technologies with innovative applications that aim to protect the environment and increase energy efficiency in an amount not exceeding 50 % of eligible investment expenditure; the subsidy can be combined with tax breaks, which vary depending on the size of the investment and the region in which these technologies are to be used

Source: authors' elaboration based on Przeglad... (2011) and Reforming... (2007)

As compared to the other countries presented, Poland is quite an interesting case. Electricity produced from renewable energy sources is exempt from excise duty in this country. There is also a possibility to deduct from the tax base of corporate and personal income taxpayers up to 50 % for new technologies. You can also get a tax exemption from personal income tax based on a thermal modernization bonus. This bonus is due to the investor to repay part of the loans taken for thermal modernisation, if there is a reduction in energy consumption.

Finally, as regards agriculture, there is an investment exemption in agricultural tax in Poland for expenditures on the purchase and installation of equipment for the production of energy from renewable sources (in the amount of 25 % of investment outlays from due agricultural tax, from the land on which the investment was founded). It can be used for No more than 15 years. However, tax incentives for investments in this area in Poland end with this. There are also No regulations aimed at encouraging entrepreneurs to use products from domestic farmers. Poland is not an exception in this area, as other countries also do not support their agriculture in this way.

2. Modern paradigms/concepts of agriculture in the context of environmental protection

Paradigms in agriculture as „sets of concepts, practices or thought patterns that create a framework to define our way of looking at something” (Steele, 2016) have strongly evaluated under the influence of changes in the environment of business organizations. The paradigms related to sustainability have played an important role from the 1980s (e.g. the Brundlandt Report in 1987). Byerlee, de Janvry and Sadoulet (2015) argued convincingly that „globalization, integrated value chains, rapid technological and institutional innovations, and environmental constraints have deeply changed the context for agriculture's role”. They proposed a New Paradigm that may be useful for

„triggering economic growth, reducing poverty, narrowing income disparities, providing food security, and delivering environmental services“. The concept of Byerlee et al. (2015) was mainly addressed to governments in developed countries. However, this approach to roles of agriculture is based on a radical reorientation in a general philosophy of agricultural finance. There is a plethora of determinants (including mega-, macroeconomic and social) that may affect development of the agricultural sector in a near future. The concept of the so-called Model of European Agriculture significantly underlines its need to „provide a competitive and diverse agricultural sector that is environmentally responsible and addresses issues of food quality and animal welfare“ (Cardwell, 2014). This is consistent with pressures from supra-national organisation (including WTO, OECD etc.) that recommend and supervise the set of economic tools within the legislative framework in order to maintain the sustainable development.

The main objectives of the new Common Agricultural Policy (CAP) will include (Communication... 2017, p.11):

„(1) to foster a smart and resilient agricultural sector;

(2) to bolster environmental care and climate action and to contribute to the environmental and climate objectives of the EU;

(3) to strengthening the socio-economic fabric of rural areas“.

The aforementioned EU Document (i.e. Communication..., 2017) strongly emphasizes the need to rebuild the model of European agriculture that is, however, based on a very traditional and narrow concept of sustainability. In order to broaden the picture of modern approaches to agriculture in the context of environmental protection, we should also mention two developed concepts: smart agriculture (smart and sustainable development of its sector) and agriculture resilient to shocks.

The first of these two involves both smart farming technologies (SFT) that are important for „delivering a more productive and sustainable agricultural production, based on a more precise and resource-efficient approach“ (Smart..., 2017). Smart agriculture instruments should therefore support farmers in delivering public goods and maintaining biodiversity of rural ecosystems. They should be oriented to fostering both technological development with digitisation (related to precise agriculture) and better access to training, advice and innovation. This should result in „resource efficiency enhancing an environment and climate smart agriculture“ (Communication..., 2017, p. 12). The instruments to secure that goal should include smart investment subsidies (e.g. under the second pillar of the CAP) with a good project controlling system (including their environmental effects) and financial tools (for example preferential credits for financing „cleaner“ technologies).

The agriculture resilient to shocks, on the other hand, that is agriculture less sensitive to exogenous shocks, should be equipped with a set of risk management tools that—in the European context—should be partially supported by EU bodies (within CAP). The modern approach that is presented in the aforesaid document (Communication... 2017) may be based on traditional instruments (for example, direct payments with more precise eligibility criteria) and institutional actions (related to price risk management, e.g. derivatives for agricultural commodities). Catastrophic events related to climate change may be mitigated by public interventions, but investment activities in rural areas are not without significance.

The operationalised concepts of modern agriculture that is smart and resilient include various political and economic instruments that may affect the impact of farms on their environment. However, they stimulate farmers to change on-farm strategies that is crucial from the perspective of environmental protection. The concepts (in general) and paradigms (*sensu stricto*) should be

operationalised with the use of political, legal and economic tools. For example, FAO underlines the role of sustainable intensification (sustainable crop production intensification, SCPI) that may be a useful as path to more efficient agricultural systems in both developed and in-transition countries. Some political recommendations for fostering SCPI include, inter alia (Save and Grow, 2011):

- „Linking public and private sector support“;
- „Incorporating the value of natural resources and ecosystem services into agricultural input and output price policies“;
- „Increasing coordination and reducing transaction costs“;
- „Building regulatory, research and advisory systems for a very wide range of production and marketing conditions“.

The second bullet refers to eliminating subsidies on fertilizers/pesticides and designing positive incentives, such as payments for environmental services, or environmental labelling in value chains. The third one involves „coordinated action to reduce the transaction costs of access to input and output markets, extension and payments for environmental services“ (Save and Grow, 2011).

Table 3

Evaluation of environmental protection instruments in the context of new agricultural development paradigms

Instrument	Impact on sustainability in agriculture			Impact on smart development	Impact on shock resilience
	societal	environmental	economic		
Eco-taxes / charges	-	+	-	+	-
Separate area payment	+	+/-	+	-/+	+
Subsidies for crop insurance	+	+	+	+	+
Tax on nitrogen fertilizers	+	+	-/+	+	-
Subsidies for investment in adaptive capital	+	+	+	+	+
Greening payments	-/+	+	-/+	+	-/+
Carbon tax for emissions to soil	+	+	-	+	-
RDP subsidies (agri-environmental and LFA)	+	+	+/-	+	+
Preferential loans for financing pro-ecological investments	-/+	-/+	+	-/+	-

Source: authors' elaboration based on Bragadottir et al. (2014), Przegląd... (2011) and Reforming... (2007)

The above presentation of environmental protection instruments as well as agricultural paradigms in the EU allows us to move on to the analysis of their interdependencies (Table 3). The analysis of the information summarised shows that tribute instruments (e.g. eco-taxes) may have a negative impact on the social sustainability of agriculture. On the other hand, in the case of area payments (e.g. in the form used in the CAP so far), as well as preferential loans and credits (for financing pro-ecological investments), the impact on environmental sustainability is ambiguous (unless they stimulate sustainable intensification of cultivation or animal breeding). It is, however, difficult to

show the positive impact of a separate area payment, or credits and loans, in the current formula. Nonetheless, it is worth noting that CAP subsidy instruments, by their very nature, support farms' resilience to shocks (area payments in particular are a tool for stabilizing agricultural incomes in EU countries).

Conclusions, proposals, recommendations

- 1) The range of instruments for environmental protection extends from a wide catalogue of administrative interpretations, through a catalogue of fees and impulse stimuli (penalties), deposit systems and market creation mechanisms, to subsidies, concessions and loans.
- 2) However, in the set of instruments, particular attention should be paid to fiscal instruments that could play a special role in relation to other instruments—above all, an autonomous role in shaping the financial base of the state's environmental policy.
- 3) In selected European countries discussed here there is a number of initiatives in the form of tax incentives supporting environmental protection.
- 4) The arguments for their application are, inter alia, perception of environmental taxes as effective tools for solving environmental problems and potentially higher economic growth.
- 5) Research indicates, however, that the implementation of fiscal instruments for environmental protection is rarely accompanied by real GDP growth, which is related to limited investment and a decrease in the competitiveness of countries that have introduced taxes to systems comparing to countries not using these mechanisms. These arguments may discourage the introduction of fiscal solutions to agriculture.
- 6) The necessary assessment of the impact of environmental protection instruments on sustainable-development, smart and resilient to shocks agriculture (being the three main contemporary agricultural paradigms identified here), should take into account their mutual interactions (substitution/complementarity).
- 7) It seems necessary to harmoniously expand fiscal/financial instruments of environmental protection, as well as to establish administrative regulations, taking into account the assessment criteria from the perspective of the state, the sector, as well as social environment.
- 8) Decision-makers shaping the instruments of agricultural policy (at the EU and national level), as well as climate and environmental policies for rural areas, should precisely identify groups of related instruments—typically of a tax, subsidy or financial nature—taking into account the economic size or production type of farms. This objective may be served by more precisely determined eligibility criteria as well as by the promotion of certain types of instruments (e.g. preferential loans and subsidies, or RDP subsidies), which have not been widely disseminated to entities that could potentially benefit from them so far.

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