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# TAX POLICY TOOLS VS. SUSTAINABLE DEVELOPMENT OF AGRICULTURE. THE CASE OF POLAND

## Abstract:

A transition from conventional to sustainable model of agriculture depends on various factors. Sustainable development of farms may be described in terms of three dimensions, ("economic, environmental and social"). The Green Growth paradigm indicates the significance of economic policy interventions, including subsidies and tax incentives. A gap in the literature on agricultural economics and finance explains the need for studies on a fiscal dimension of sustainability of farms.

The main aim of the paper was to highlight the role of selected tax policy tools from the perspective of sustainable development of agriculture. The research goals were as follows (1) to present a review of selected tax policy instruments in an international context, (2) to analyse the impact of selected tools on making pro-environmental actions (based on experts' opinions). Our paper concluded with proposals and recommendations on the aforesaid process for policymakers.

Fiscal instruments that may affect sustainability in agriculture exist in the majority of Old Member States of European Union (e.g. the Netherlands, Germany, Austria). The ongoing “Agricultural tax” (‘podatek rolny’) that affect a majority of Polish farms and their organization of production favours leads to maintaining sustainability of agriculture (given an environmental dimension of sustainability). The existing tax instruments have a neutral or positive impact on environmental sustainability. The highest medium positive impact on the medium are characterized by capital allowances and deductions for the purchase of new environmental technologies.

Polish policymakers should reasonably developed a more detailed fiscal policy instruments, e.g. investment reliefs (similarly, as in the Netherlands), subjective exemptions in respect of agro-environmental practices. In the near future a key role in environmental protection will be played by a group of small farm households. These entities will be responsible for provision of public goods for Polish agricultural sector.

## Keywords:

agricultural taxation, sustainable development, agricultural finance, fiscal instruments, family farms

**JEL Classification:** Q14, H25, Q01

# 1 Introduction

A theoretical framework for “sustainable development” of agriculture stems from general definitions of “sustainability”. For example, one of first widely cited definitions formulated by Brundtland Commission (United Nations General Assembly, 1987) put an emphasis on “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. As underlined in the quoted definition, “sustainable development” is connected with a strong concern for the needs for future generations, thus, exploring intertemporal choices. Arrow et al. (2010) noted that the Commission’s definition omitted the aspect of human well-being. Furthermore, The 2005 World Summit on Social Development (United Nations General Assembly, 2005) underlined three fundamental dimensions of “sustainable development”, namely (1) economic, (2) social, (3) environmental. It should be noted these subareas of “sustainability” (also regarded as “pillars”) cannot be treated separately.

According to European Commission (2015), “market-based instruments (MBI), such as environmental taxes, tradable permit systems or targeted subsidies, are a cost-effective way to protect and improve the environment”. The significant role is played by a very broad category of environmental taxes (levies) “Greening” the financial system is oriented to the "internalisation of environmental externalised ecological costs” (Rogall, 2012). This can be achieved by a variety of instruments, inter alia ecological fees, bonus-malus systems, tolls, and above all ecological tax reform. .The latter instrument may be treated as the element of a Europe-wide fiscal reform (e.g. 2003 - introducing a minimum taxable amount on electricity and fuels). Having described the intentions of "green" tax reform in Germany, Rogall (2012) enumerated some "disadvantages", such as the process of elimination of various types of subsidies that may be detrimental to the environment, and increasing levies on energy, raw materials and harmful substances. However, this leads to a multiple of dividends, involving a reduction of other liabilities or partial support of environmental investments (European Environmental Agency, 2012). Wiesmeth (2012, p. 191) explained advantages of “ecotaxes”, underlining “a double dividend”: “in the form of a better economic performance accompanied by sustainable development without increasing the tax burden for the economy as a whole”. So-called Green Fiscal Reform (GTR) or Environmental in the United Kingdom (UK) would foster investment in “low-carbon industries”, neverheless its impact on the competitiveness of selected sectors (Green Fiscal Commission, 2009). As Fullerton, Leicester and Smith (2008, p.2) stated, “the case for using environmental taxes, emissions trading and other economic instruments is primarily a matter of efficiency”. They explained that advantages of environmental taxes refer to a possible reduction of cost of “achieving a given level of environmental protection”. Bluffstone (2003) explained why transition countries are willing to use environmental taxes. First, these levies may substitute traditional forms of taxation (such as, taxes on labour or consumption) and generate state revenues, though adversaries underline deadweight losses created by environmental levies. Second, environmental taxes as tools employed for “internalization of negative externalities” may be an impulse for improving efficiency and technological changes (Bluffstone, 2003). The justification for implementing various environmental taxes refers to combating with negative environmental behaviour, consequently pollution reduction, monitoring and enforcement.

A transition from conventional to sustainable model of agriculture depends on various factors The Green Growth paradigm indicates the significance of economic policy interventions, including subsidies and tax incentives (Stevens, 2011). This paradigm is described by the fact that "traditional economic and environmental measures of progress are replaced by indicators of the linkages between the use of environmental goods and services and economic growth" (Stevens, 2011, p.4). According to OECD (2015), one of the functions of advisory, training and extension services is taking care of economic performance of farm households by raising farmers' awareness of many benefits of economic instruments. While the ecological tax reform has a wider context and refers to the economy as a whole (see: Arbolino and Romano, 2015; Abdullah and Morley, 2014; Colson and Menapace, 2012; Cherry, Kallbekken, and Kroll, 2014; Cherry, Kallbekken, and Kroll, 2012; Chiroleu-Assouline and Fodha 2014; Ciaschini et al., 2012; Ercolano, Gaeta, and Romano, 2014; Ekins et al., 2011; Kallbekken and Sælen, 2011; Liu, 2013; Piciu and Carmen, 2012; Oueslati, 2014; Oueslati, 2014; Piciu and Trică, 2012), only selected tax instruments can be used as an instrument to improve the sustainability of the agricultural sector (Siddiqui, 2015;. Säll and Gren, 2015; Dörschner and Musshoff, 2015).

The main aim of the paper was to highlight the role of selected tax policy tools from the perspective of sustainable development of agriculture (given an environmental dimension of sustainabilty). The research goals were as follows (1) to present a review of selected tax policy instruments in an international context, (2) to analyse the impact of selected tools on making pro-environmental actions (based on experts' opinions). Our paper concluded with proposals and recommendations on the aforesaid process for policymakers.

## 2 Tax policy instruments oriented to environmental sustainability in selected EU countries

In the majority of EU countries policymakers have decided on using various types of environmental taxation. Theoretical basis for environmental taxes stems from a concept of Pigovian tax as the tool intending to overcome the effect of negative externalities. Environmental challenges for development of tax tools may be explained by "the double market failure", namely innovation undersupply combined with "pollution oversupply" (OECD, 2010, p.18).

According to OECD (2010, p. 11), policymakers may use some of various environmental policy tools, including:

- regulatory-based (or "command-and-control") instruments,
- "market-based instruments" (inter alia, taxes and tradable permits),
- negotiated agreements,
- subsidies,
- "environmental management systems" and information instruments.

In most EU countries agricultural taxation is a combination of taxes that are based on various bases (including income, consumption, value of assets). Environmental levies at

the state or regional level (for example, in Spain or Germany) are also employed as important fiscal policy tool. A list of reasons for using environmental taxes include (OECD, 2011):

- an effect of “pricing in” of environmental costs,
- the “least-cost” way to reduce the environmental change,
- benefits connected with flexibility of this type of instruments (e.g. improvement of competitiveness, incentives for enterprises to develop existed technologies).

Table 1 presents a composition of the “environmentally related tax revenues” in the selected EU countries (OECD Members). It should be noted that in the case of Poland tax revenues from energy are relatively high compared to other analysed countries. Table 2 shows examples of “full” exemptions for the agricultural sector. Various agricultural activities may be the subject of various exemptions. Spain is a very interesting example: as the federal state Spain uses various types of environmental taxes and charges (including tax on air pollution).

**Table 1: Composition of Environmentally Related Tax Revenues in Selected EU Countires in 2008**

| **Countries** | **Energy [%]** | **Motor vehicles [%]** | **Other [%]** |
|---|---|---|---|
| Spain | 1.29 | 0.33 | 0.03 |
| France | 1.42 | 0.22 | 0.10 |
| Poland | 1.80 | 0.06 | 0.09 |
| Belgium | 1.23 | 0.57 | 0.16 |
| Slovak Republic | 1.78 | 0.18 | 0.00 |
| Greece | 1.32 | 0.80 | 0.00 |
| Germany | 1.83 | 0.35 | 0.00 |
| United Kingdom | 1.76 | 0.51 | 0.09 |
| Ireland | 1.19 | 1.14 | 0.03 |
| Austria | 1.63 | 0.72 | 0.05 |
| Luxembourg | 2.34 | 0.17 | 0.00 |
| Italy | 1.90 | 0.58 | 0.03 |
| Sweden | 2.18 | 0.36 | 0.05 |

| | | | |
|---|---|---|---|
| Portugal | 1.92 | 0.71 | 0.00 |
| Slovenia | 2.32 | 0.19 | 0.14 |
| Czech Republic | 2.33 | 0.28 | 0.08 |
| Finland | 1.78 | 0.89 | 0.06 |
| Hungary | 2.04 | 0.57 | 0.27 |
| Denmark | 2.11 | 1.84 | 0.30 |
| Netherlands | 1.92 | 2.03 | 0.54 |
| Average (OECD countries) | 1.09 | 0.46 | 0.04 |

*Source: based on OECD database.*

**Table 2: Full exemptions for the agricultural sector from the perspective of environmentally related taxes**

| Countries | Privileges |
|---|---|
| Austria | ▪ Motor vehicle tax (R) |
| Belgium | ▪ Additional road tax<br>▪ Road tax<br>▪ Excise duties (e.g. gas oil, kerosene, LPG, electricity, coal) |
| Czech Republic | ▪ Fees to cover watercourse and river basin administration and to cover public interest expenses (tax on water extraction)<br>▪ Road tax |
| Denmark | ▪ Duty on nitrogen |
| France | ▪ Tax on vehicle axles (R) |
| Germany | ▪ Motor vehicle tax<br>▪ Water abstraction charge (Mecklenburg-Western Pomerania) |
| Hungary | ▪ Excise tax on diesel<br>▪ Tax on motor vehicle (R) |
| Ireland | ▪ Mineral oil tax on oil |
| Italy | ▪ Excise duty on energy products (gas oil for greenhouse production) |
| Netherlands | ▪ Motor vehicle tax (R)<br>▪ Tax on groundwater extraction |
| Spain | ▪ Charge on water (a part of regions)<br>▪ Tax on waste (Madrid, Murcia)<br>▪ Tax on environmental damage caused by some uses of water from reservoirs (Galicia)<br>▪ Tax on air pollution (swine production in Murcia)<br>▪ Tax on vehicle registration (one-off and recurrent) |

Note: R) as recurrent; there is a list of “full exemptions” for agriculture, additionally reductions in environmentally related taxation for agriculture exist

*Source: based on OECD (2010, p. 52).*

## 3 The impact of selected tax instruments on environmental sustainability

The panel of experts (min. PhDs in economics or related sciences, N=11) were surveyed in order to assess the strength and direction of existing taxes and new fiscal instrument in Polish agriculture on a environmental dimension of sustainability.

The important solution that may be conducive to environmental protection and aimed at promoting pro-environmental actions is to reduce the burden of taxation from income taxes (CIT, PIT) or other commonly occurring taxes such as VAT, excise duties, agricultural tax (typical for Poland). Such solutions could be used in agriculture, which plays an important and natural role in environmental protection, including the protection and preservation of habitats and biodiversity (see: Giergiczny, and Śleszyński, 2004).

As a detailed analysis of data from Table 3 depicts, traditional taxes and levies affecting Polish agriculture had an impact on an environmental sustainability (approx. 53% of responses). This situation may indicate that these tools in their current form are unsuitable for forming the desired actions in the field of environmental sustainability in agriculture. In particular, according to experts' opinion, usefulness was linked to income tax (approx. 64% of respondents), followed by excise duties (50%) and VAT (approx. 41% of responses). It should be added that 40% of respondents underlined positive impact, while a weak positive impact was indicated by approx. 19.7% of surveyed. A „high positive" note was indicated by approx. 3.3% of experts. Just 5.0% of the surveyed experts indicated that existing taxes have a negative impact on the improvement and protection of the environment. Among traditional taxes that may adversely affect the environment shows mainly on CIT (approx. 4.5% of responses) and excise tax (9.1%). On the other hand, many experts believe that tax tools integrated in the corporate income tax and VAT may contribute to the improvement of the natural environment. It should be noted, however, that the most important tax burden in Polish agriculture is the agricultural tax, which according to most experts (56.4%), however, does not play a significant role in shaping the environmental balance. It should be added that approx. 42% of respondents noted that the agricultural tax instruments could positively affect the balance, which confirms their detailed analysis.

**Table 3. The direction of impact of taxes existing in the Polish agriculture to environmental sustainability in external experts' opinion**

| Type of tax | The direction of the impact of selected taxes (% responses) | | | | | | |
|---|---|---|---|---|---|---|---|
| | High negative | Medium negative | Low negative | Neutral | Low positve | Medium positive | High positive |
| Agricultural tax | 0.0 | 1.8 | 0.0 | 56.4 | 29.1 | 9.1 | 3.6 |
| Income tax | 0.0 | 3.9 | 0.0 | 63.6 | 14.3 | 15.6 | 2.6 |
| Corporate Income Tax | 4.5 | 0.0 | 0.0 | 22.7 | 40.9 | 22.7 | 9.1 |
| VAT | 0.0 | 4.6 | 0.0 | 40.9 | 40.9 | 13.6 | 0.0 |
| Excise duty | 9.1 | 0.0 | 4.5 | 50.0 | 18.2 | 13.6 | 4.5 |
| *On average* | 1.5 | 3.0 | 0.5 | 55.1 | 19.7 | 16.7 | 3.5 |

*Source: own studies.*

As shown in Table 4, the positive impact of agricultural tax is mainly attributed to investment reliefs (over 90% of responses, of which 45.5% of the surveyed experts assessed the amount of this impact and at the medium level and 18.2% of them indicated the high strength of the impact.

**Table 4: Impact of tools concerning "agricultural tax" on environmental sustainability of agriculture**

| Type of instrument tool | The direction of the impact of instrument (% of responses) | | | | | | |
|---|---|---|---|---|---|---|---|
| | High negative | Medium negative | Low negative | Neutral | Low positve | Medium positive | High positive |
| Tax rate | 0,0 | 0,0 | 0,0 | 63,6 | 36,4 | 0,0 | 0,0 |
| Privileged principles of taxation | 0,0 | 0,0 | 0,0 | 72,7 | 27,3 | 0,0 | 0,0 |
| The tax exemption | 0,0 | 0,0 | 0,0 | 63,6 | 36,4 | 0,0 | 0,0 |
| Investment relief | 0,0 | 0,0 | 0,0 | 9,1 | 27,3 | 45,5 | 18,2 |
| Waiver of tax collection | 0,0 | 9,1 | 0,0 | 72,7 | 18,2 | 0,0 | 0,0 |

*Source: own studies.*

The analysis of the impact of particular tax instruments indicated their neutral impact on the environmental sustainability of agriculture (Table 5). The average strength of their impact, according to experts, was associated with capital allowances and deductions for the purchase of new technologies. The abovementioned considerations lead to a conclusion that in Polish agricultural tax system there is a small group of tools currently used and affecting environmental sustainability. The problem is, however, a lack of targeting of these activities on specific agricultural entities, because this system applies to the entire agricultural sector.

**Table 5. The strength of the impact of current tax instruments in shaping environmental sustainability (the most frequent responses)**

| Type of tax | The strength of impact and the type of tax instrument | | |
|---|---|---|---|
| | Neutral (0) | Low postive (1) | Medium positive (2) |
| Agricultural tax | The amount of tax levied<br>Waiver of tax collection<br>• Privileged taxation rules<br>• Tax exemptions | | Tax relief |
| Income tax | • Tax rate<br>• The amount of tax-free income<br>• Deductions in the form of insurance premiums<br>• One-time depreciation<br>• Waiver of tax arrears<br>• Deduction of tax losses | | Tax relief |
| CIT | | Exemption from taxation of income from the lease of agricultural land | Deductions for the acquisition of new technologies |
| VAT | Simplified tax rules („VATRR") | Preferential rates for agricultural products | |
| Excise duty | • Reimbursement of part of the tax included in the price of oil<br>• Relief for biofuel producers | | |

*Source: own studies.*

A detailed overview of experts' opinions on new taxation tools indicated that in this case there is full compliance experts as to the direction their impact (Table 6). A significant proportion of these instruments was negatively assesed, which may indicate the concerns of experts about the effects of the introduction of such taxes in agriculture. A literature review, however, shows that environmental taxes would have to be at a very high level to cover them all budgetary expenditures, and reduce or abolish burden for current taxes. In the context of environmental protection introducing new taxes on agriculture would mean the achievement of environmental goals at much higher cost.

Experts suggested that the negative impact on the environment in agriculture could be linked to environmental taxes and deposits (Table 4). According to their opinions, an additional fiscal burden for Polish farms that could not lead to significant changes in their behavior in terms of environmental protection. Such a large discrepancy of these results may indicate either a weak recognition of the problem of the impact of new tax instruments for the sustainability of agriculture, or the ongoing dispute relating to the reasonableness of the introduction of this type of solutions to the Polish agriculture.

**Table 6: The direction of the impact of „new“ tax tools on environmental sustainability**

| Type of tax tool | Type of the impact on „new" tax tools on environmental sustainability (% responses) | | | | | | |
|---|---|---|---|---|---|---|---|
| | High negative | Medium negative | Low negative | Neutral | Low positve | Medium positive | High positive |
| The tax differentiation depending on the scale of environmental pollution | 0.0 | 9.1 | 0.0 | 27.3 | 36.4 | 18.2 | 9.1 |
| The fee for putting pollutants into the environment | 0.0 | 27.3 | 36.4 | 0.0 | 27.3 | 0.0 | 9.1 |
| Product Charge | 0.0 | 27.3 | 36.4 | 9.1 | 27.3 | 0.0 | 0.0 |
| User fee | 0.0 | 18.2 | 36.4 | 36.4 | 9.1 | 0.0 | 0.0 |
| Administration fee | 9.1 | 9.1 | 27.3 | 27.3 | 18.2 | 9.1 | 0.0 |
| Environmental taxes | 18.2 | 45.5 | 9.1 | 0.0 | 18.2 | 9.1 | 0.0 |
| Deposits | 9.1 | 36.4 | 27.3 | 18.2 | 0.0 | 9.1 | 0.0 |
| Environmental permits | 0.0 | 9.1 | 45.5 | 9.1 | 27.3 | 0.0 | 9.1 |

*Source: own studies.*

A positive assessment of tax differentiation depending on the level of environmental pollution seems to be noteworthy (Table 7). It was believed that such a perception might be treated the consequence of the economic situation of Polish farms and suitability of

analyzed tools to different types of activities. It should be noted, however, that tax differentiation was the most common form of hidden subsidizing different subsectors of agriculture and represented a substitute for existing taxation tools used in Polish agriculture tax system.

Having analysed the strength of the impact of “new” instruments for environmental sustainability, in agriculture „low positive” impact might be linked to a tax differentiation (Table 7). The vast majority of "new" instruments, according to experts’ opinion, may have a negative impact, whereas the strength of this impact would be an average for environmental taxes and low for most other instruments such as fees for emitting pollutants into the environment, product fee, user fee, deposits and environmental permits.

**Table 7: The strength of the impact of „new” tax tools on shaping environmental sustainability (the most common responses)**

| Strength of the impact | | | |
|---|---|---|---|
| **Medium negative (-2)** | **Medium low (-1)** | **Neutral (0)** | **Low positive (1)** |
| Ecological taxes | The fee for putting pollutants into the environment<br>Product Charge<br>User Fee<br>Deposits<br>Enviromental permits | The administrative fee | Tax differentiation |

*Source: own studies.*

## 4 Concluding remarks

Fiscal instruments that may affect sustainability in agriculture exist in the majority of Old Member States of European Union (e.g. the Netherlands, Germany, Austria). The ongoing “Agricultural tax” (‘podatek rolny’) that affect a majority of Polish farms and their organization of production favours leads to maintaining sustainability of agriculture (given an environmental dimension of sustainability). The existing tax instruments have a neutral or positive impact on environmental sustainability. The highest medium positive impact on the medium are characterized by capital allowances and deductions for the purchase of new environmental technologies.

Polish policymakers should reasonably developed a more detailed fiscal policy instruments, e.g. investment reliefs, subjective exemptions in respect of agro-environmental practices. In the near future a key role in environmental protection will be played by a group of small farm households. These entities will be responsible for provision of public goods for Polish agricultural sector.

The assessment of the impact on the new tax instruments is rather sceptic. The tax differentiation may lead to an increase in a positive yet low impact on environmental dimension of sustainability. In Polish agriculture, the use of tax differentiation could supplement or replace the selected instruments in the current tax system oriented to the agricultural sector.

Further research should concentrate on "real-world complications" concerning environmental taxation. These include developments of "trading systems" for pollution permits and "deposit-refund systems" that may be treated as new instruments oriented to overcoming problems connected with an asymmetry of the information. It is also necessary to design policies combining both "efficiency goals" with distributional aspects (see: Bovenberg and Goulder, 2001).

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