FINANCING AGRI-ENVIRONMENTAL PROGRAMS IN POLAND:
THE IMPORTANCE OF REGIONAL PREFERENCES

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The importance of regional preferences

1. Introduction

Since Poland accessed the European Union in May 2004, the agri-environmental programs are obligatory political measures in creating a policy of rural areas. Due to the short EU membership period there is little experience with financing the agri-environmental policy and especially the financing of agri-environmental programs. The decisions on how to create agri-environmental programs are, basically, made at the Ministry for Agriculture and Rural Development. As the natural conditions in the voivodships (administrative regional units) in Poland are differentiated, an important question is: How could the budget allocation meet regional preferences? To discuss this question we use a linear programming approach according to Kirschke and Jechlitschka (2002). To assess regional preferences for the National Agri-Environmental Program, regional actors in the voivodship Podkarpackie in South-eastern Poland were interviewed. As the region is characterized by a high value of natural resources and agriculture is one of the most important sectors, it is worth analyzing the budget allocation in this region with regard to the objectives of environmental protection. Considering the preferences revealed and other budget restrictions, some relevant financing issues are discussed in this paper.

The paper is structured as follows. The next chapter provides an overview about the development of the agri-environmental policy in Poland since 1990 and the experience with agri-environmental programs in the European Union. In the following section, a linear programming approach is used to calculate budget allocation scenarios with respect to preferences as well as to estimate trade-off between objectives. Finally, some conclusions about the importance of the analyzed objectives of environmental protection in the budget allocation are drawn.

2. Agri-environmental policy in Poland

Since May 2004 the agri-environmental measures are obligatory in creating a policy for rural areas in Poland according to the EU regulation 1257/99 (EG-Verordnung, 1999). However, the idea of environmental protection in agriculture is relatively new in Poland.

The first political measures to protect natural resources in agriculture were established in 1990 with the „National Environmental Policy“ (Ministry of Environmental Protection,
Natural Resources and Forestry, 1991). The next step in developing an agri-environmental policy was the program SAPARD (Special Accession Program for Agriculture and Rural Development) for the period 2000-2006. According to this plan, agri-environmental programs were planned, too. However, due to political strategy changes as well as due to missing legal rules, the planning of agri-environmental measures was abandoned under SAPARD (Ministerstwo Rolnictwa i Rozwoju Wsi, 2002 pp. 117-121). The first successful agri-environmental measures were realized in the year 2000 and 2001 with an EU project Phare99.

After Poland’s accession to the EU, the financing and creating of agri-environmental measures (sustainable agriculture, organic farming, extensive meadow farming, extensive pasture farming, ground and water protection, puffer zones, and protection of domestic farm animal species) is based on the National Agri-Environmental Program for the first membership period (2004-2006). The National Agri-Environmental Program is an integral part of the Plan for Development of Rural Areas (Plan Rozwoju Obszarów Wiejskich – PROW). According to this plan the available budget for agri-environmental measures amounts to 348,9 million €, which is 9% of the total budget for all measures realized with PROW. The National Agri-Environmental Program is co-financed by the European Agricultural Guidance and Guarantee Fund (EAGGF) (80%) and the Polish state budget (20%) (Ministerstwo Rolnictwa i Rozwoju Wsi, lipiec 2004 pp. 111). The main objectives of the Program are: protection of natural resources, protection and conservation of biodiversity, and protection of cultural landscape in rural areas. The objectives of the National Agri-Environmental Program reflect environmental priorities with regard to natural conditions in many regions in Poland; especially in those characterized by a large number of nature protection areas.

While the agri-environmental programs are new in Poland, the experience in the member countries of the EU-15 confirms, in most cases, positive effects of the programs. Since the McSharry-Reform in 1992 the agri-environmental programs are an integral part of the EU policy and a precondition for support from the EAGGF. Although the whole budget for agri-environmental programs amounts solely to 4% of all expenditures from the EAGGF (Section Guarantee), the evaluation of the programs is optimistic (Europäische Kommission, GD V, 2004). However, some authors mention negative aspects in the realization process of the agri-environmental programs. The Report to the European Commission (Baldock et al., 2002) points out the necessity of change in calculating agri-environmental payments to farmers and considering special conditions in some regions, where the co-financing share from the European Community is said to be too low.
Agriculture is an important sector in the Polish economy (the employment share amounts to 26%), which is reflected in its great influence on the usage of natural resources in rural areas. As the agri-environmental measures are new, there is little experience in creating financial strategies. The question of objective-oriented and efficient budget allocation is therefore of a great importance for political decision makers as well as for regional societies.

3. Problem setting

According to the National Agri-Environmental Program in Poland the agri-environmental measures can be realized in two ways: on a horizontal level (in the whole country) or in 69 selected priority regions (characterized by specific environmental problems or by particular natural features). The measures such as sustainable agriculture, extensive meadow farming, and extensive pasture farming are executed in priority regions, which were selected by regional working groups on behalf of the Ministry for Agriculture and Rural Development. The other measures can be realized horizontally which creates more possibilities for farmers. A problematic issue in this context is the central financing of agri-environmental measures. The prerequisite for realizing the agri-environmental measures is the support permission from the Ministry for Agriculture and Rural Development. As natural conditions as well as farming conditions in different regions of the country are differentiated, the priorities regarding environmental objectives in agriculture are different. In this context there is the question, how the agri-environmental measures could be financed to meet regional preferences and to what extent weighting the objectives would effect the budget allocation? Answering these questions could help to determine budget allocations for agri-environmental measures to achieve the objectives of environmental protection in the region Podkarpackie in a best possible way.

Another point is the EU budget for agri-environmental programs in the period 2007-2013. Although the farmers’ interest in agri-environmental measures in Poland is expected to increase in the next years, no radical change in financing these measures is expected. The future support share for agri-environmental programs in the European Union is planned to amount to about 12% of the EAGGF (Section Guarantee).

Considering differentiated objectives in rural areas in every region of the country and the increasing interest in agri-environmental programs, the aim of the paper is to analyze the scenarios of budget allocation between political measures with regard to achievement of environmental objectives.
4. Research region

The discussion in this paper is based on a case study conducted in the voivodship Podkarpackie in South-eastern Poland. The voivodship is characterized by a large number of valuable natural resources and protected areas. Most areas in the voivodship are involved in the Euro-region Karpaty (an association of Karpaty regions between five neighbor countries of the Central and Eastern European Countries (CEEC) which includes Poland, Ukraine, Romania, Hungary and Slovakia). The main aim of the Euro-region Karpaty is focused on an efficient and sustainable usage of natural resources in all associated countries. The problem of an efficient use of natural resources has such a big importance in this region due to its economic situation. The region can be characterized by the third biggest number of agricultural farms in Poland (311,855) (Urząd Statystyczny w Rzeszowie, 2003 pp. 20; Główny Urząd Statystyczny, 2003 pp. 171), while the employment share in agriculture amounts to about 47% (Podkarpacki Urząd Wojewódzki, 2004). The agricultural production has therefore a great effect on the utilization of natural resources. Also the size of agricultural farms in the voivodship (3,5 ha on average) (Dmochowska, 2003) in comparison to large-sized farms in other countries of the European Union (17,5 ha on average) (Boschma et al., 2005) points out the importance of agri-environmental programs in sustainable development in the agricultural sector. Considering these aspects, the voivodship seems to be a good example to analyze questions of budget allocation with regard to the objectives of environmental protection in agriculture.

5. Methodical approach and data

Taking into account the interest in agri-environmental programs in Poland’s first membership period in the EU and regional natural conditions in the voivodship Podkarpackie, the main research questions are:

– How should the budget be allocated to meet regional preferences with regard to environmental conditions, and

– how could the objectives of environmental protection in the agricultural sector be achieved in a best possible way.

To answer these questions we use a linear programming approach according to Kirschke and Jechlitschka (2002). This model helps us to discuss the problem of objective-oriented budget allocation in the region as it delivers results of maximizing an objective function under given
restrictions. For this approach political measures, objectives, objective coefficients and restrictions have to be identified.

The political measures were derived from the National Agri-Environmental Program for Poland. The measures are: sustainable agriculture, organic farming, extensive meadow farming, extensive pasture farming, ground and water protection, puffer zones, and protection of domestic farm animal species. The objectives taken for the analysis (protection of natural resources, conservation of biodiversity, protection of cultural landscape in rural areas) are the main objectives adopted in the National Agri-Environmental Program. An important restriction in the model is the upper budget bound for all measures. Other restrictions involved in the model are: the upper bound of Poland’s state budget and the available farming area in the voivodship for realizing the measures. The restrictions were calculated on the basis of statistical data for the voivodship Podkarpackie.

To assess the importance of the measures with respect to the named objectives, agricultural experts in the voivodship have been asked to state their preferences. They assessed the importance of the respective political measures on an interval scale “one to nine” taking into account regional agricultural and environmental conditions. The objective coefficients were included in the model as an interval mean value of all given answers. The objective coefficients for the respective measures in the National Agri-Environmental Program are displayed in figure 1.

Figure 1 Programming resources for agri-environmental measures in the voivodship Podkarpackie

Source: Own compilation based on statistical data from the Statistical Office in the voivodship Podkarpackie (Urzad Statystyczny w Rzeszowie, 2003)
The estimation of regional actors shows that the objective coefficients vary in the case of every measure and each objective. However, most measures were assessed as most suitable to achieve the objective ‘protection of natural resources’ and ‘conservation of biodiversity’. The ground and water protection measure was assessed as most important to reach the objective ‘protection of natural resources’, while the sustainable agriculture, organic farming, and extensive meadow farming measures have the same magnitude for the objective ‘protection of natural resources’. The protection of domestic farm animal species measure is the most important measure to achieve the objective ‘conservation of biodiversity’ and extensive pasture farming measure to achieve the objective ‘protection of cultural landscape’. Most measures have similar importance with regard to the analyzed objectives. There is only one measure ‘extensive pasture farming’ which was assessed as the most important to achieve the objective ‘protection of cultural landscape’. Figure 2 visualizes the relative magnitude of the objective coefficients.

Figure 2  Comparison of coefficients in terms of objective achievement

![Figure 2](image_url)

6. Results and discussion: optimal allocation

Taking into account the objective coefficients and other relevant restrictions, the optimal allocation for specific agri-environmental measures to maximize the regional objective achievement can be determined. Considering the available budget for the case study we have assumed an equal financial allocation between the voivodships in Poland. Hence, the budget was set on the level computed as an average amount for each voivodship in the first
membership year of Poland in the EU. To point out the trade-off between the objectives, two of them: ‘protection of natural resources’ and ‘conservation of biodiversity’ were included in the sensitivity analyses. These objectives were chosen due to the importance of the respective measures with regard to objective achievement given by regional actors. The last objective was involved in the model as a restriction in order not to exclude its potential influence on the budget allocation. The restriction ‘state budget of Poland’ indicates the co-financing share of 20% for the Agri-Environmental Program. The upper budget bounds were calculated on a base of data from the Ministry for Agriculture and Rural Development and Statistical Office in the region Podkarpackie. The upper bounds are a product of areas planned to be involved in the realization of agri-environmental measures and payment rates for every measure in each voivodship in Poland. The restriction ‘available farming area’ was calculated as a product of the agricultural area in the voivodship Podkarpackie and the payment rate for each measure. The expenditures on agri-environmental programs in the voivodship Podkarpackie in the period September 2004 – April 2005 are displayed in figure 3.

Figure 3 Expenditures on agri-environmental measures in the voivodship Podkarpackie in the period September 2004 – April 2005

Using the linear programming approach the budget allocation in the first membership period of Poland in the EU was computed. In this calculation the objective coefficients for the objective ‘protection of natural resources’ and ‘conservation of biodiversity’ were equally weighted and set on the level of 0,5, respectively, while the objective ‘protection of cultural landscape’ was not weighted.

The computed results show that, under the given restrictions, protection of domestic farm animal species and extensive meadow farming should be supported as the only measures from the regional perspective. A difference to the current allocation, derived from this calculation, is displayed in figure 4.

Figure 4 Difference to the current allocation from a regional point of view

Source: Own calculation

The protection of domestic farm animal species and extensive meadow farming measures were assessed by regional actors as most important and also the upper budget bound for the realization of the first named measure is high in comparison to the other measures. Due to the lower importance of the other measures reflected in lower objective coefficients and due to a high level of the upper bound in the case of the measure ‘protection of domestic farm animal species’, there is no budget left for financing the other measures.
7. Results and discussion: sensitivity analyses

Discussing an optimal budget allocation, changes in the budget allocation for different weights of the objectives should be considered. Hence, the weight for the objective ‘conservation of biodiversity’ was set gradually from zero to one while the weight for the objective ‘protection of natural resources’ was set in the inverse sequence. The results of this parameterization are displayed in figure 5.

Figure 5  
Trade-off between the objective ‘protection of natural resources’ and the objective ‘conservation of biodiversity’

The computed results show that at a low importance level of the objective ‘conservation of biodiversity’ the advisable measures to realize are: ground and water protection, organic farming, and extensive meadow farming. With growing importance of the objective ‘conservation of biodiversity’ the budget should be allocated to protection of domestic farm animal species and extensive meadow farming measures, and, finally, only to protection of domestic farm animal species measure. According to these results a trade-off between the two main objectives in the budget allocation can be stated.

Another aspect to be discussed is the relevance of the third objective ‘protection of cultural landscape’ for the optimal budget allocation. Therefore, the objective ‘protection of cultural landscape’ was included in the model as a restriction. To analyze its importance, it was parameterized between 0 and 100%. The weights for the objectives ‘protection of natural resources’ and ‘conservation of biodiversity’ were unchanged in comparison to the initial situation and were set at the level of 0,5. The results of this analysis are displayed in figure 6.
According to the analysis, the measures to be preferably financed are: protection of domestic farm animal species and extensive meadow farming. There is no change in budget allocation while weighting the objective ‘protection of cultural landscape’. Due to available budget and given upper bound restrictions, there would be no budget left for financing the other measures. Hence, considering the objective ‘protection of cultural landscape’ does not influence budget allocation.

A final analysis refers to a varying budget allocation for the Agri-Environmental Program for the period 2007-2013. This should help to assess the impact of political allocation in the voivodship Podkarpackie. The sensitivity analysis of the budget amount is displayed in figure 7.

Source: Own calculation
Given an increase in the available budget for the Agri-Environmental Program, under unchanged restrictions, the calculations show a growing importance for protection of domestic farm animal species measure. While cutting the available budget, the support for this measure would decrease. On the other hand, the extensive meadow farming measure would be financed at an unchanged level. The analysis shows that the protection of domestic farm animal species measure is highly dependent on the available budget.

8. Conclusions

The presented analysis shows that regional preferences regarding agri-environmental programs would have a considerable impact as comprised to the given allocation.

According to the analysis, the most important measures in the voivodship Podkarpackie to reach the objectives are protection of domestic farm animal species and extensive meadow farming. These measures seem to have the most importance for reaching both the first objective ‘protection of natural resources’ and the second objective ‘conservation of biodiversity’. The third objective ‘protection of cultural landscape’ has no impact on the budget allocation.
References


