Interactive programming of rural development funds – lessons from the field

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Abstract: Within this paper, we present an interactive modelling approach to support budgeting decisions at the program level and discuss its potential and limitations to contribute to more objective-oriented policy-making. The central feature of the approach is a linear optimisation model which is interactively defined and used together with the Ministry of Agriculture and the Environment in Saxony-Anhalt, Germany. We show how the current EAFRD framework can be translated into a model, and how this provides positive learning effects and increases in-house communication and transparency. From a conceptual point of view, the case study underlines the necessity to provide a simple and applicable methodology causing certain compromises with regard to theoretical soundness.

Keywords: rural development policy-making, interactive programming, budgeting, decision aid

JEL classification: Q18, H72, R51

1. Introduction[1]

The total volume of funds provided by the European Agricultural Fund for Rural Development (EAFRD) for the financial period 2007-2013 amounts to 96.3 billion Euros (EC, 2009). These funds are distributed among the member states, which are obliged to draw up Rural Development Programmes (RDPs), and select a subset of policy measures towards which the limited resources are directed. These resource allocation decisions are, compared to the previous funding period, embedded in an increasingly strategic and objective-oriented approach pursued by the European Commission (EC) and Council. Nevertheless, scholars investigating the present agenda of priority setting within this field, point out clear limitations when it comes to the core issues of an objective-oriented approach; e.g. the limited use of evaluation in the programming of RD funds and the high degree of 'path dependency' guiding actual resource allocation decisions (c.f. Dwyer et al., 2009, Schiller, 2009).

Given the complexity associated with public resource allocation decisions in general (e.g. presence of multiple objectives, high degree of uncertainty, many impacted groups, etc.), research from different disciplines has long been motivated by the questions whether and how the process of priority setting can be supported, and how this could contribute to more objective-oriented public policy-making. A diverse body of literature exists in which the underlying assumptions, opportunities and limitations of a more rational approach towards public priority setting are debated (c.f. Cleland, 2008 for a recent overview).

Referring to this body of literature, rational approaches to priority setting interfere with the complexity of the systems that are analysed. As Bots and Hulshof (2000: 56) put it: 'Policymaking involves priority setting and rational priority setting requires knowledge of objectives, causes and effects.' The manifold conceptual and practical difficulties in collecting and linking data to the impacts of policy instruments exemplify the limitations of a strictly rational approach. Furthermore, evidence from the many studies on priority setting, point out diverse problems that arise from the mechanism and logic of the policy arena. The most extreme point of view is 'that budgeting is

[1] Financial support from the German Research Foundation (Deutsche Forschungsgemeinschaft - DFG) through Research Unit 986 'Structural Change in Agriculture' is gratefully acknowledged.

inherently political rather than rational, and that politics will always win out, thus making the aim of rational expenditure prioritization largely an illusion' (Robinson and Brumby, 2005: 15). A number of scholars arrive at less definite conclusions but equally point to critical barriers for explicit priority setting, such as information burdens, transaction costs and arising political conflicts (e.g. Schick, 1998 in his review of public expenditure management). In line with this, Hajkowicz and McDonald (2006: 100) conclude from their studies on environmental priority setting that 'it is often necessary to balance theoretical correctness against the practical needs of programme managers who typically make decisions with incomplete data, limited access to analytical skills and tight time frames'. Hence, a prominent point of view is that the institutional dimension of priority setting needs to be taken into account next to the analytical dimension. The guiding academic imperative in this field should be to better understand institutional dynamics rather than simply applying or fostering a rational approach (Cleland, 2008: 18).

Furthermore, so called interactive approaches are increasingly promoted to support decision-making in the public sector. Approaches that allow for the involvement of the decision-makers (DMs) are believed to foster learning processes that permit the DMs to better understand the system being analysed and, thus, to make better informed and more sensible decisions. Therefore, their main objective is not to find one optimal solution or to provide recommendations for direct courses of action. Instead it is the improvement of decision-making quality and to focus on an improved structuring and transparency of the problem at hand (c.f. Wallenius, 1991, Bots and Lootsma, 2000, Geurts and Joldersma, 2001, Munda, 2004). Alongside this, researchers increasingly conclude that more emphasis is needed on the initial formulation and structuring of the decision problem, and that sensitivity analysis should be at centre stage (c.f. Hajkowicz and Higgins, 2008, Kaliszewski, 2004, among others). Moreover, simple, clearly defined and flexible models should be used especially to support decision-making in the public sector, (e.g. Munda, 2004, Walker, 2000).

Apart from these rather general recommendations, there is little formalised knowledge on how to actually support public prioritisation processes since the conceptual approach is highly contingent on the particular institutional setting. Moreover, empirical evidence exists foremost in certain policy fields. Whereas the number of actual decision support studies is rather high in the health sector as well as in natural resource management/environmental decision-making (c.f. Gamper and Turcanu, 2007, Zanakis et al., 1995), very little empirical evidence exists in the field of rural development.

In an attempt to fill this gap, two decision support studies on priority setting in regional RD programming have been conducted at the Department of Agricultural Economics at Humboldt-Universität zu Berlin. Central features in both cases have been the interactive definition and use of a multi-objective linear programming approach together with DMs from the Ministry for Agriculture and the Environment in Saxony-Anhalt, Germany. The first study focused on the programming of agro-environmental measures and took place between 2003 and 2004.[2] The second study started in late 2008 and extends the focus to the modelling of an entire RDP. Whereas the intermediate goal of translating the European RD framework into a model and specify the input parameters in an interactive process have been achieved, the model use phase is still ongoing. The central aims of this paper are to present the particular modelling approach, to review the undergone process and to discuss its potentials and limitations to contribute to a more objective-oriented resource allocation process at the program level.

The remaining part of this paper is organised as follows. In section 2, we introduce the key terms used in this paper, summarise the present agenda of priority setting in the RD policy field, and point out the general framework for resource allocation decisions at program level. Section 3 is devoted to the case study. The focus here is on the methodological approach, its implementation, and the feedback obtained from the ministry. Hence, we will not refer to the particular model specification and only briefly summarise particular model results. Based on the empirical case, we discuss in section 4 the potentials and limitations of the pursued approach in guiding a more objective-oriented priority setting process. Finally, we draw concluding remarks in section 5.

[2] To obtain an overview of this study compare Kirschke et al. (2004, 2007) as well as Prager and Nagel (2008).

2. Priority setting in the RD policy field

2.1 Terminology

A *priority* is commonly defined as 'something one does first' (Stewart, 1995: 117) or 'a fact or condition that is judged to be more important than another' (Campbell, 2009: 2). As such, priorities are the outcome of a choice or selection process between different alternatives, and *priority setting*, in its most general perception, refers to the process of arriving at these decisions. This process of priority setting can be characterised by the degree of explicitness involved. A rather implicit approach takes place when the elements that form the decision base (e.g. objectives and preferences) are not articulated and discussed ahead of time (Cleland, 2008: 45ff.). As a consequence, resource allocation decisions rely on somehow silent arrangements or intuitive judgments and are hardly traceable for the outsider. Conversely, explicit priority setting refers to a conscious and rational process guided by a set of principles which are then transformed into decision rules. An explicit or rational approach to priority setting within a budgetary system includes the specification of the decision environment (encompassing objectives, alternatives and constraints), the subsequent assessment of the effects of the alternatives on the defined objectives, the comparison of the alternatives and the subsequent selection (Alston et al., 1995: 19). The term *objective-oriented policy-making* refers to a rational approach to public priority setting since its core issue is to achieve allocative efficiency of public funds by the means of linking government priorities and resource allocation to results.

Within an institutional context, priorities are set at different levels (e.g. at national or program level), and incorporate different scopes and issues (c.f. Janssen, 1995). Authorities at the macro level (e.g. governments) are typically faced with decisions on the overall political concerns and strategy development or particular budget ceilings. Whereas authorities at the micro (or program) level operate within a tight budgetary system and must decide how given funds are to be used to best satisfy agency goals and targets.

2.2 Contemporary agenda

The determining institutional factor of the RD policy field is its embedment into the multi-level system of the EU. Thus, priority setting in the RD policy field involves decisions to be made on at least two administrative levels: the EU and the Member States. Additionally, in the case of regional programming processes, the respective regional levels of the member states need to be included.[3] The focus of this paper is on the actual budget allocation decisions at program level. Compared to the previous funding periods, these decisions are embedded in a much more strategic and objective-oriented approach pursued by the European Union (EU). This is represented by the particularities of the newly introduced three-level programming process and by ever increasing requirements to evaluate the national (or regional) RDPs.

The three-level programming process consists of the top-layer, the EU, who sets the overall priorities via the Community guidelines (Council of the European Union, 2006) and further specifies these priorities by the means of particular instruments and requirements outlined in the EAFRD regulation 1698/2005 and Commission regulation 1974/2006 (Council of the European Union, 2005, EC, 2006). Particular arrangements at this supranational level refer to the co-financing regime and thus to the decision on the actual menu of measures eligible for co-financing and to the axes-specific co-financing rates. Furthermore, the minimum spending requirements for the measures grouped in the priority axes (c.f. EAFRD regulation, art.17) as well as the specification of particular measure-specific support rates (c.f. EAFRD regulation, appendix 1) constitute a binding frame for what we call the subsequent macro and micro level of the three-level programming process: The overall strategy outlined in the National Strategy Plan (NSP) and the actual RDP wherein a subset of measures from the EU menu are chosen towards which the funds are directed. Particularities arise when member states with regional programming processes choose to submit a National Framework and when this

[3] Member states that submitted single RDPs for their regions are Belgium, Great Britain, Germany, Italy and Spain. Additionally, Portugal, Finland and France submitted a program for their mainland and additional regional RDPs for their islands (EC, 2008).

Framework comprises an additional national co-financing regime as this is the case in Germany.[4] Table 1 summarises the multi-level framework and particularly points out the general frame for budget allocation decisions at the micro level.

Table 1. Priority setting within the three-level programming process.

Level	In charge	Documents to be produced	Decisions to be made	Particularities that frame budget allocation decisions at the micro level
Supra-national	European Commission, Council	Strategic Guidelines, EAFRD regulation, EC regulation 1974/2006	• main concerns of EU • distribution of funds among member states	• Requirement of downward compliance with overall objectives • Co-financing regime • Minimum requirements • Support rates
Macro	Member states	National Strategy Plans (including SWOT analysis)	• main concerns of governments • distribution of funds among regions*	• Requirement of downward compliance with overall objectives
Micro	Member states OR regions	RDPs (including SWOT and ex-ante analysis)	• resource allocation decisions	

*only in case of regional programming processes.
Source: own compilation.

As noted above, the knowledge and actual incorporation of causal relationships between expenditures and effects is the key element in an objective-oriented approach to resource allocation decisions. Regarding evaluation, the current regulatory framework requires quite a demanding effort at all stages of the programming process (e.g. ex ante, mid-term and ex post evaluation of the RDPs). However, the key question of all evaluation activities is whether their outcomes are actually used. Here, all scholars investigating this question mainly come to the same conclusion. According to Heintel (2004), evaluation is seen as an external requirement and all involved program authorities show little interest in the process as well as the outcomes of evaluation activities. With respect to an analysis of the German RD policy design process, Schiller (2009: 37) notes that 'evaluation results have not played a large role in the design of measures and programmes'. In contrast, resource allocation decisions at the micro level are 'mainly based on political will and programme history' (Schiller, 2009: 35). Despite this assessment, the same scholars attribute a number of positive effects to the overall programming approach outlined by the EU regulations. Dwyer et al. (2009) point to positive policy learning effects among the main authorities and key stakeholders involved in the programming process. They characterise the current approach as one that 'fostered reflection, improved dialogue, broadened involvement in rural policy-making and increased inter-sectoral understanding' (Dwyer et al., 2009: 5).

However, this short overview of the contemporary agenda on priority setting in the RD policy field confirms our observations that resource allocation decisions at the micro level are made rather implicitly and largely remain a 'black box'. Even though program authorities need to define objectives and a number of program specific indicators against which their RDPs are to be evaluated, the decision-making process is mainly characterised by a low level of consciousness regarding the key parameters of a more objective-oriented approach to priority setting. Not surprisingly, almost no external scientific expertise (apart from the required ex ante analysis) has been used to accompany the programming process. A notable exception in the German context is Saxony-Anhalt. As part of an integrated strategy for the programming of EU funds[5], an external evaluator was asked to rank all

[4] In Germany, the Joint Action 'Improvement of Agrarian Structures and Coastal Protection' (Gemeinschaftsaufgabe Verbesserung der Agrarstruktur und des Küstenschutzes – GAK) is used as a National Framework. In the frame of the GAK, additional co-financing is provided for a subset of measures from the EU menu. Hence, the regional share of the national co-financing obligation decreases for all measures that fall under the frame of the GAK. For the particularities that arise from this system for resource allocation decisions at the program level see Schmid et al. (2010).

[5] This concerns besides the EAFRD the European Regional Development Fund (ERDF) and the European Social Fund (ESF).

possible measures according to their contribution to a prior defined hierarchy of objectives (c.f. GEFRA and ESRI, 2006). The outcomes were then used as a discussion basis for the integrated programming of the EU funds and served as a rough guide for the three ministries involved in the programming of the EU funds. However, even though this certainly contributes to an increased transparency in the overall programming process, scoring approaches provide only rough guidance in actual resource allocation decisions. Limitations refer to the fact that the manifold constraints involved in the programming process (e.g. overall budget availability and requirements of the EU regulations) are not considered and that the objectives and preferences of the actual DMs at program level were not included (Kirschke and Häger, 2006).

3. Case study

3.1 Preparatory steps and background information

The present study builds upon previous research which had been conducted on budget allocation decision in the Ministry of Agriculture and the Environment in Saxony-Anhalt. Thus, existing contacts to the ministry were used as a 'door opener' into an otherwise difficult to access arena. First contacts were initiated in November 2008 through the deputy minister who was in favour of the general project idea to support and facilitate budget allocation decisions in the ministry. Since the original programming process had been finalised by that time, it was agreed upon using a formal optimisation tool for the purpose of a strategic in-house revision of the entire RDP. The ministry was particularly keen to analyse strategic options for the expected loss of the convergence region status. Furthermore, implications of regional budget cuts should be analysed due to the at that time already apparent pressure on the availability of regional funds.

Two higher ministry representatives of the managing authority and the paying agency in Saxony-Anhalt were assigned as contact persons in charge of the communication process on the side of the ministry. It was agreed upon establishing an expert group comprised by key ministry staff from the departments involved in the RDP programming process. This group should be actively involved in the specification of the model and the subsequent model use.

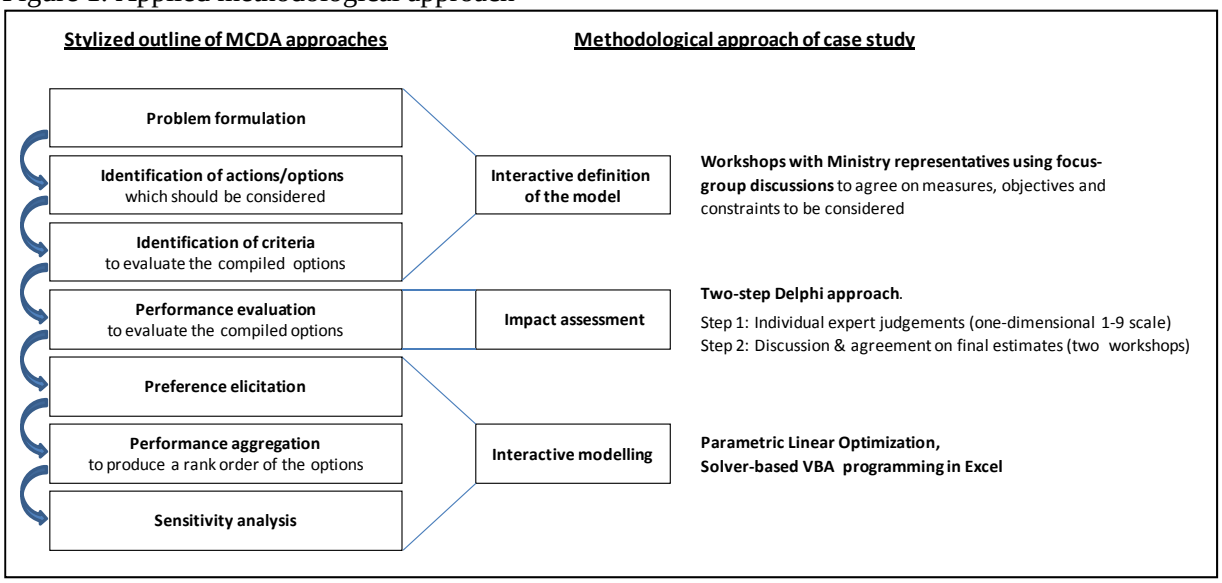
In a second preparatory meeting, the expert group[6] was introduced to the concept of linear optimisation by exploring a model that has been developed in the previous application mentioned above. Hence, the general model choice has been made a priori. Particularly, the underlying assumption of constant and marginal objective coefficients and the requirements concerning data input have been discussed. Noticeably, a substantial part of the discussion evolved around the question of what kind of results will be achieved and if the expert group is prepared for results that might not match actual resource allocation patterns.

3.2 Methodological approach and model structure

The guiding motivation for the case study is to analyse how micro level resource allocation decisions in the RD policy field can be supported effectively. Given the multi-objective environment of RD policies and the quite large number of different measures which are implemented to reach these objectives, DMs in this field face a classical multi-criteria decision analysis (MCDA) problem where a number of different alternatives (in our case: measures) are to be defined and evaluated against a set of criteria. A stylised outline of such MCDA approaches as well as the particularities of our approach is depicted in figure 1.

[6] The expert group was composed of seven ministry representatives from the key RD departments in the ministry.

Figure 1. Applied methodological approach



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The guiding principle of the approach chosen for the case study is an interactive definition and use of a linear optimisation model implemented in Excel. The model definition phase comprised five workshops with ministry representatives in which the actual model structure and the essential input parameters were discussed and defined. This constituted a highly iterative process with several feedback loops between the different dialog phases and model development. The process was guided by the aim to provide a realistic planning instrument for the entire RDP of Saxony-Anhalt. Thus, all decision regarding the model structure and definition were made from a budgeting perspective and particular emphasis had been put on the disentangling of the complex financial framework.

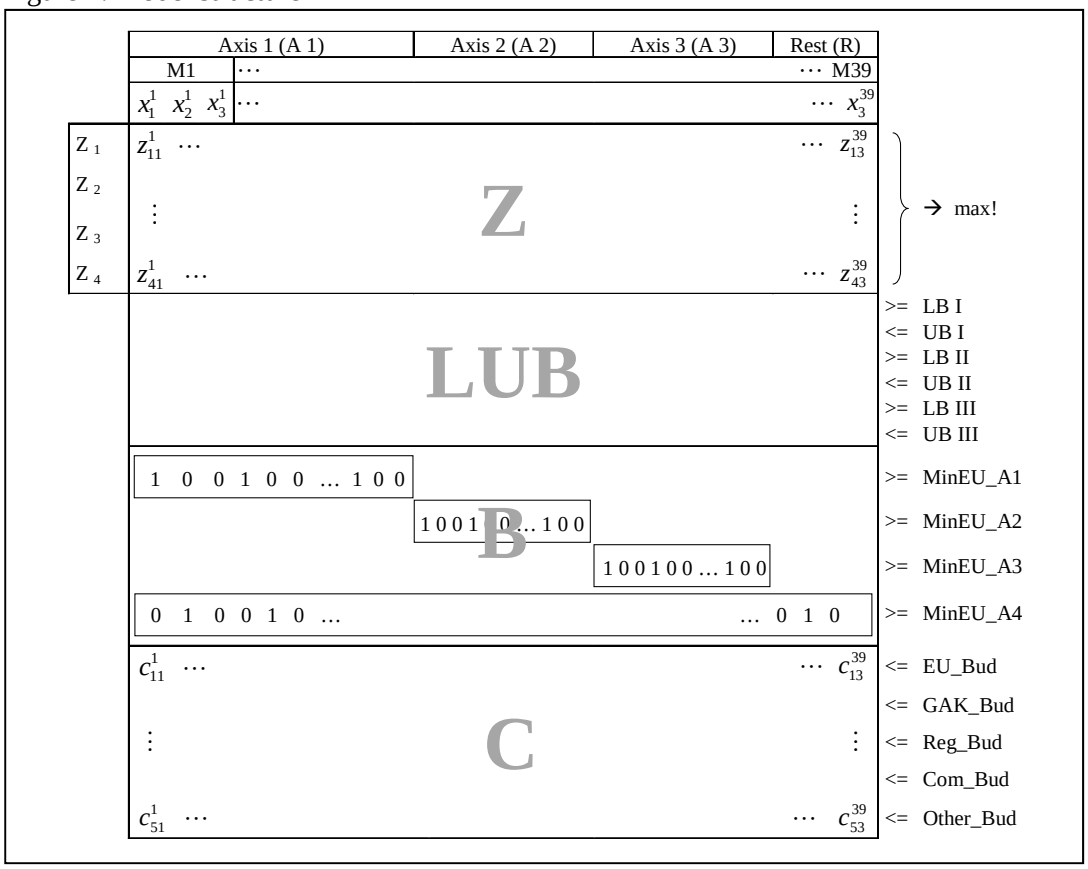
The impact assessment has been executed using a two-step Delphi approach. In a first round, individual judgments from representatives from all relevant RD departments were collected using emailed scorecards. Subsequently, these judgments have been merged and graphically processed. The results were emailed back to all relevant RD departments and served then as a basis for discussion in two workshops with the expert group (Sept. 2009, April 2010). The impact parameters that were generated and revised in this way were then fed into the model as objective coefficients.

With respect to the interactive modelling sessions, the focus lies on the budget allocation of a set of policy measures. Thus, we face a continuous solution space and apply a classical multi-objective programming method, a linear optimisation model. Following Jechlitschka et al. (2007), the model is implemented in Excel by constructing a single aggregated objective function with weights specifying the relative importance of each of the objectives under consideration. As with most interactive programming approaches, this preference information was not elicited beforehand but constituted an essential part of the interactive modelling sessions (c.f. among others Wallenius, 1991 for an overview of different preference assumptions in MCDA approaches). The modelling sessions follow an iterative procedure. The DMs define scenarios which are then implemented in the model. Various 'real time' calculations are executed and the obtained solutions are analysed and compared to interactively chosen reference scenarios. Parametric linear optimisation of key parameters is used to exemplify trade-offs and sensitivities of model results.

An overview of the linear optimisation model is provided in figure 2. Accordingly, the model comprises four main parts apart from the structure and specification of measures and objectives. Z and C are the matrices for the impact parameters z^i_{jk} and the financial contribution rates c^i_{rk}. LUB and B are particular 0-1-matrices where the relevant variables for the respective constraint may take the values one or zero.[7]

[7] For the actual model specification see Schmid et al. (2010).

Figure 2. Model structure



Source: own compilation.

The overall model structure is determined by the decision on what kind of measures and expenses should be integrated in the model. The starting point for discussion was the actual RDP of Saxony-Anhalt. Taking the official measure codes (defined in Commission Regulation 1974/2006, annex II) as a point of reference, Saxony-Anhalt currently implements 28 out of the 43 measures from the EU menu. These measures have been partially disaggregated when the financial modalities for the sub-measures differ or when the impacts of sub-measures were considered as substantially different. As a result, the model comprises 39 measures. The total amount of funds allocated to a measure comprises expenses under the EAFRD standard mode (x_1), funds directed to Leader implementations (x_2) and additional national funds (x_3). To account for the different co-financing modalities associated with these three options, each measure has been compartmentalised. Hence, the model comprises 117 decision variables for which the budget allocation is calculated.

With respect to objectives, it was agreed upon considering the two official objectives of Saxony-Anhalt originally formulated in the planning process for the European Structural Funds and the EAFRD (c.f. MLU, 2009: 104ff.): Economic development of rural areas (Z_1), and the creation of employment opportunities in rural areas (Z_2). The third objective of environmental protection and nature conservation (Z_3) is a cross-sectional objective in the official planning process of Saxony-Anhalt. Given the debate about ever increasing administrative burdens, mainly due to the EU's Integrated Administration and Control System (IACS), we considered as a fourth objective administrative efficiency (Z_4) indicating the administrative burden to implement the measures.

With respect to constraints, the model basically contains three main parts. Lower and upper bounds (LUBs) that restrict either the aggregated budget volume allocated to a measure or their three different financing and implementation modes, lower bounds that restrict the allocation of EU funds to the four priority axes (minimum requirements of the EU) and the budget availability on all relevant administrative levels.

Regarding the measure-specific LUBs, three simple bounds were implemented. The LUB I, on the one hand, reflect the potential range of the budget volume allocated to a measure as a whole. These constraints were a major outcome of one of the workshops at the ministry and are based on

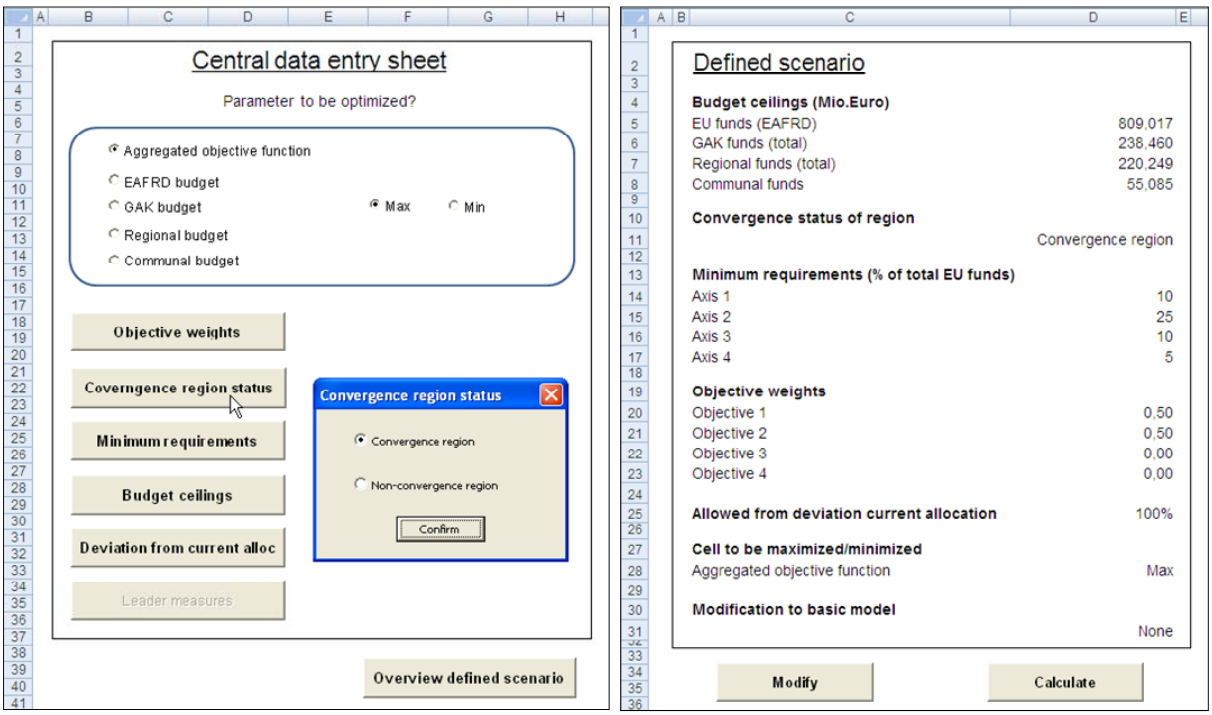
considerations and estimations of the DMs. The LUB II, in contrast, restrict the budget allocated to the different financing and implementation options outlined above. Hence, it is possible to account for, e.g., the financial commitments under the previous programming period (which have to be financed by the standard EAFRD mode) or to restrict the budget allocation to a measure under the Leader implementation option. Furthermore, through the LUB II it is possible to integrate specific requirements of the EAFRD regulation such as the requirement to allocate a maximum of four percent of the EAFRD funds to the measure 511 (c.f. EAFRD regulation, art. 66). The LUB III (like the LUB I) are bounds for the budget volume aggregated to a measure as a whole. They reflect the allowed deviation from the tentative allocation as set out in the official RDP and can be set for all measures at once. Thus, an allowed deviation of ten percent results in a measure-specific LB of 90% and an UB of 110% of the current allocation. Past interactive modelling sessions revealed that it is a good strategy to start the modelling exercise by allowing for various deviations from the current solution.

The minimum contribution requirements (RHS of block B) constitute an important set of constraints. However, they are easy to implement and were not part of the interactive model definition process since they are externally defined by the EU. In contrast, the generation of the co-financing parameters (block C) has been a time-consuming process. In order to automatically derive the financial contribution rates on all involved administrative levels, three criteria have been specified for each of the decision variables: the financial contribution rate of the EU, the eligibility to receive additional national funds and the percentage of communes as beneficiaries (c.f. Schmid et al., 2010 for a more detailed description).

3.3 Model interface and results

An appropriate user interface is a key issue in interactive modelling approaches (Wallenius, 1991). Since our model is implemented in Excel we used Visual Basic for Applications (VBA) to facilitate the 'real time' calculations. The interface comprises a central data entry sheet in where a number of key parameters need to be set to define a certain scenario (c.f. figure 3).

Figure 3. Screenshots: data entry sheet and overview of scenario



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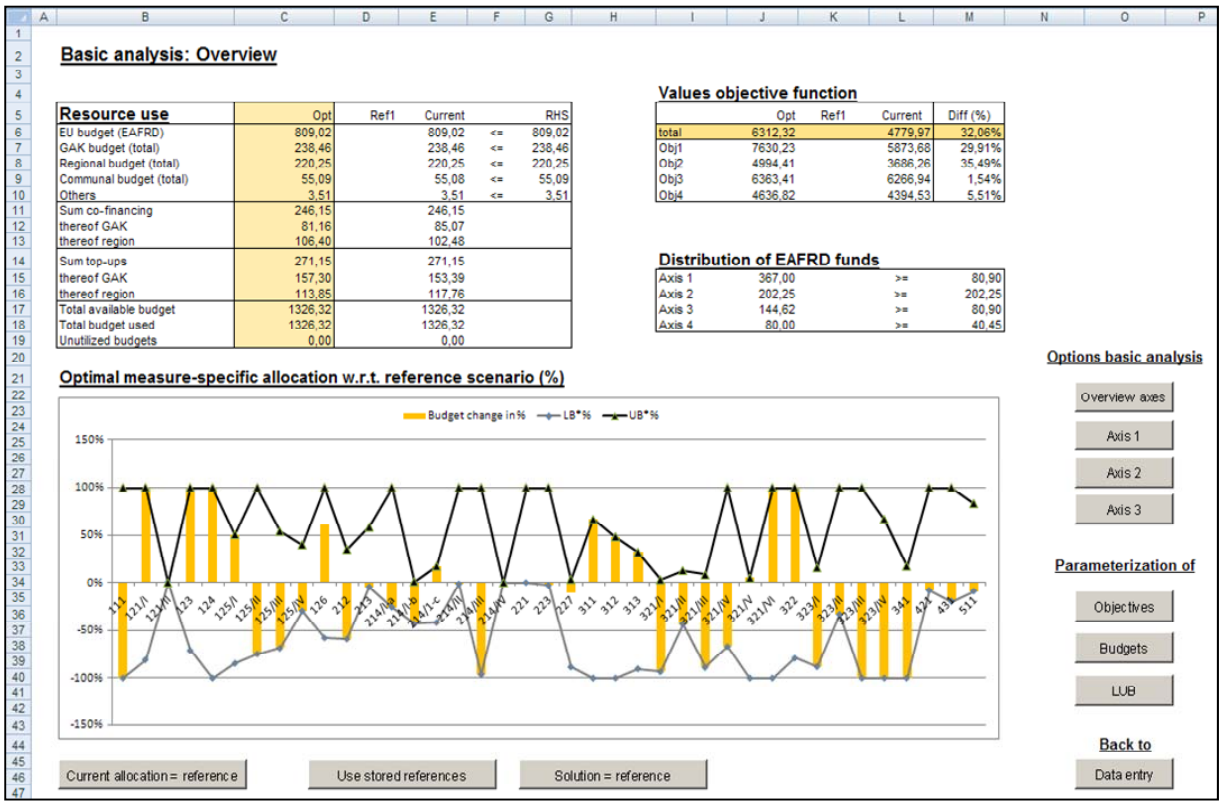
The externalised key parameters are: The weights assigned to the objectives, the convergence region status, the minimum requirements, the budget ceilings on the different administrative levels, and the allowed deviation from the current allocation. All other parameters (e.g. the LUBs) may equally be modified by accessing further, more detailed, data entry sheets. Once the scenario to be calculated is defined and approved, the model runs in the background and produces various result sheets which progressively zoom into different level of detail. The user is guided through these result sheets by interactive buttons. The first result sheet provides an overview with respect to the resource use on the different administrative levels, the values of the objective function and the allocation of EU funds to the priority axes. Furthermore, a first insight into the measure-specific allocation of funds with respect to a certain reference scenario is provided (c.f. figure 4).

Figure 4. Screenshot: overview basic analysis



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From this rather general overview, it is possible to access other result sheets that provide more detailed information regarding two questions: what are the shares of the three different financing modes and on which administrative level are the expenditures actually borne. This information is provided on three different aggregation levels: As an overview for all axes, for each axis alone and for each measure. Furthermore, it is possible to execute parameterisations of the objective weights and the budget availabilities on the different administrative levels. Whenever the DMs decide to explore a new scenario, the results of the model run can be stored in order to be used as a reference scenario for one of the subsequent model runs.

So far, we executed several test runs with a priori chosen weights for the objectives. Additionally, we had one joint session with the expert group (April 2010). This session served the purpose of acquainting the DMs with the model and receiving valuable feedback concerning general accuracy and the further development of analysis options. The subject investigated were the implications of reduced regional funds as well as the expected loss of the convergence region status.

Content-wise the main results of these calculations can be summarised as follows. First, all calculations reveal rather large optimisation potentials with up to 30 percent increase of the objective function value compared to the current allocation. Second, the Ministry of Saxony-Anhalt strongly

focuses on economic objectives (higher preferences for objective one and two in the model runs) which results in allocation outcomes in where the minimum funding requirement form a binding constraint for the measures grouped in the second priority axis. Consequently, trade-off analyses between the objectives show considerable difference in allocation patterns for the axes and their respective measures. Third, scenario calculations with reduced regional funds clearly show the effects and distortions that arise from the European and German co-financing regime. Tight regional budget availabilities yield reallocation patterns that substantially focus on measures for which the regional financial responsibility is small (c.f. also Kirschke et al., 2007). The implications arising from it (loss of objective realisation and shifting of financial responsibilities to communes) were analysed and subject to discussion within the interactive modelling session.[8]

3.4 Feedback from the ministry

Given the multitude of constraints involved in micro level resource allocation decisions, the application of a multi-objective programming approach was generally regarded as suitable. Regarding the choice to use a rather simple LP model implemented in Excel, we received positive feedback from the ministry. Even though the DMs were rather unfamiliar with modelling they had little difficulties to understand the basic model structure and, thus, to actively frame the multi-criteria problem at hand.

According to the involved ministry representatives, the developed model captures their resource allocation problem accurately. It provides a suitable tool to support actual resource allocation decisions and the 'real time' calculations of our first joint modelling sessions provided valuable insights into the implications of various scenarios. The interactive model definition process fostered in-house discussions on key parameters (e.g. on pursued objectives) and, thus, a general consciousness of the particularities of an objective-oriented approach. Moreover, especially the workshops dedicated to the generation of the measure-specific LUBs as well on impacts facilitated discussions in a cross-department manner; thereby contributing to an increased in-house transparency of the aspects underlying resource allocation decisions.

Apart from this generally positive feedback, the ministry representatives repeatedly complained about the demanding day-to-day policy business and that resource allocation decisions are commonly made under an enormous pressure to meet deadlines. Hence, they found it difficult to spare enough time for the priority setting exercise even though they generally acknowledged the benefits and expressed their demand for a more long-term orientation in the policy dialogue and strategy development.

As for the future cooperation, the DMs wish to use the model to accompany the reallocation decisions following the mid-term review. Since these decisions have to be made in September/October 2010, the mid-term evaluation process is currently under way. Hence, the envisaged model use provides the opportunity to directly include evaluation results in the modelling exercise to explore reallocation options for the remaining funds for the years 2011 to 2013.

4. Discussion of benefits and limitations

4.1 Long term benefits vs. the restrictions of day-to-day policy business

From an institutional point of view, a priority setting exercise is an 'investment in knowledge in order to improve the quality of decisions' (Janssen, 1995: 82). Hence, a critical question is whether our approach contributed to an increased quality of decision-making and if the benefits arising from this exercise exceed the costs associated with it.

Summarising the benefits acknowledged by the ministry representatives, the approach fostered learning processes as well as cross-department discussions, and increased transparency. The actual

[8] To analyse these effects, the reallocation decision concerning 53 mio. EU funds (c.f. the fourth amendment of Saxony-Anhalts' RDP; MLU, 2009) was taken as an example. Originally, the ministry representatives wanted to use the model to explore reallocation options for this funds and, thus, to guide the actual decision. However, due to time limitations on the side of the ministry a prior meeting had to be postponed and the modelling session took place when the decisions had already been made. Hence, we used the model to compare the decisions made with the model outcomes and to analyse the implications arising from it.

benefits associated with an externally facilitated discussion might be exemplified by the workshop on the measure-specific lower and upper bounds (LUB I). These bounds represent logical considerations of the complex interplay between the maximum amount of land or animals (in case of area and animal based payments), the number of potential beneficiaries (in case of classical investment payments), the subsidy rate, and other regulatory settings of the respective measures. Having these criteria in mind, the measure specialists were asked to specify and discuss the maximum amount of public expenditure a particular measure could hold and a threshold below which the financing of a measure does not make sense. Notably, the comparison of the ranges defined by the workshop participants with the actual measure-specific allocation outlined in the RDP revealed substantial deviations in a number of cases. This means that the actual amounts for the measures were outside the ranges predefined by logical reasoning; which led to further discussions between measure-specialists and departments.

Apart from these beneficial effects, the ministry representatives pointed to the critical issue of time and capacity constraints. Indeed, the model specification proved to be a rather time-consuming exercise. Only a limited number of input parameters could be directly deduced from the current EAFRD framework (e.g. financial commitments of the previous funding period, minimum requirements of EU funds to be allocated to the priority axes). The majority had to be discussed and derived in joint sessions with the expert group. Whereas a number of decisions have been made relatively easy and less time-consuming (e.g. objectives and measures to be considered, aggregation level of the measures), some demanded a great deal of discussion. Notably, the workshops that mainly generated the above mentioned benefits required the highest time and capacity contributions from the ministry. Equally, the disentangling of the complex measure-specific financial framework proved to be time-consuming; even though this information has not been subject to discussion in the expert group but clarified with individual measure specialists.

Summarising these aspects reveals a contradictory situation. On the one hand, the ministry representatives acknowledge the benefits that arise from the interactive design of the approach and express a strong demand for practical as well as long term decision support. On the other hand, the time and capacity constraints of the day-to-day policy business hamper an intensive dialogue which led to the long time span of the case study and restrict the use of the model for actual resource allocation decisions. Hence, the strain perceived by the coordinating and participating ministry representatives threaten to outweigh the rather intangible long-term effects described above.

This problem poses an important restriction to our collaboration with the ministry; a problem to which no final solution exists yet. In a long term perspective, we currently discuss two different solutions. Either the priority setting exercise is equipped with additional resources or the modelling exercise is restricted to less complex problems. The first option might create an environment in which the already acknowledged benefits can be fully appreciated. Following the latter option would mean to set the problem investigated more narrowly as it has been the case in the first priority setting study together with the ministry in Saxony-Anhalt. By then, the focus was on the agro-environmental measures only and the financial framework behind the measures was simplified. This way, the input requirements decrease substantially and less ministry representatives need to be involved. However, it equally diminishes the positive effects; especially regarding the facilitation of discussions in a cross department manner and increased transparency.

4.2 Necessary compromises regarding theoretical soundness – room for improvement?

The approach pursued in the case study comprises a number of methodological features which have to be critically discussed against the theoretical requirements raised in the literature. This refers mainly to three interrelated issues: the definition of objectives, the generation of impact parameters and the integration of other stakeholders. In what follows we discuss and contextualise these issues in between the two poles of theoretical correctness and practical needs. Furthermore, we identify room for improvement.

A key issue in any MCDA approach is the definition and (if applicable) the operationalisation of objectives against which the performance of alternatives is evaluated. From a theoretical point of view the established hierarchy of objectives has to meet certain requirements of which the most important ones are completeness and independency. In our modelling exercise it has been decided to use the official (correlated and imprecisely set out) objectives defined by the regional government (economic

development of rural areas, employment and environmental protection and nature conservation) without further operationalisation. Hence, the theoretical requirements mentioned above have not been met. The decision to follow this procedure was mainly based on two considerations. Whereas the precise setting out of objectives would have made the subsequent impact generation too time-consuming, the correlated priorly defined governmental objectives were used in order to allow for the communication and usage of model results within the overarching regional planning process. The difficulties resulting from these decisions have been acknowledged and discussed with the expert group from the ministry. From a theoretical point of view, a more sound approach regarding the hierarchy of considered criteria should be envisaged. However, solving this problem inherently means to integrate higher level policy-makers since the overall objectives are not specified at the program level.

In our approach we propose the generation of impact parameters via subjective expert judgements. Using expert judgement to provide information on complex and generally poorly understood phenomena is quite common in MCDA even though the elicitation method should be carefully designed (c.f. Meyer and Booker, 2001). By using the estimates of ministry representatives (thus, defining the actual DMs as experts) we deviated from the request for independent experts as commonly claimed in the literature (e.g. Renn et al., 1993, Meyer and Booker, 2001). From such a theoretical point of view we followed a rather pragmatic approach. Since the measure-specialists asked to judge the impacts have a genuine self-interest in presenting 'their' measures in a profitable way, the results tend to be biased. To control for this, the previously generated judgements (collected from individuals throughout the ministry) have been subject to discussion and revision in two subsequent joint workshops with the expert group. This way, it was possible 'to emphasize the general above the specific interest and to make people aware of their role as impartial experts' (Janssen 1995: 90). Even though the particular results obtained still capture the point of view of the ministry and might be controversial, the procedure provides an essential basis for the implementation and use of the model. This way, the DMs were able to retrace particular differences between measures, trusted and believed in the parameters and, thus, in the model and its results. Furthermore, it contributed to the above mentioned benefits associated with the model definition in general. Even though some of the ministry representatives hesitated in the beginning to discuss the impacts of measures and felt unprepared to provide information on such an aggregated level, the feedback received after the two workshops held were exclusively positive. It was regarded as facilitating in-house discussion and thereby contributing to increased consciousness on practical objective-oriented policy-making. In particular, it was acknowledged that a forum for an integrated discussion beyond single measures was created.

It is nevertheless uncontested that the results (the actual impact parameter) as well as the process would be upgraded by the inclusion of other sources of information. This holds to different extents for almost all steps in an empirically applied MCDA approach and is mainly debated under the key word 'stakeholder integration' in the literature. Particularly for decision aiding studies aiming at the public policy arena the systematic integration and contribution of experts, interest groups and or the wider public is frequently demanded even though it is hardly implemented (c.f. Geurts and Joldersma, 2001, Tompkins et al., 2008, among others). It is believed to constitute a key element for tractable and, thus, socially accepted decision-making. Regarding the quantification of relationships between measures and objectives, it would, for example, be possible to elicit knowledge from a broad range of experts working in the field of rural development and/or evaluation. However, for the above mentioned reasons, we consider the categorical recirculation of externally derived parameters into the process with the DMs as crucial, regardless of the particular approach chosen to generate these parameters.

5 Concluding remarks

The main motivation driving our research is to analyse whether and how the RD budget allocation process at the program level can be supported effectively. The general background for this research is a complex policy framework in which sensitive resource allocation decisions are made rather implicitly. Within this paper, we presented our approach to shed some light into this 'black box' and to contribute to a more objective-oriented programming process. The central feature is a linear optimisation model which is interactively defined and used together with our partner ministry in Saxony-Anhalt. The particular aim of this paper is to discuss the potentials and limitations of our approach in guiding a more objective-oriented resource allocation process. Based on the experiences

made so far and the feedback obtained from our partner ministry, we draw the following concluding remarks.

Amongst the most challenging features in the regional RD programming process are increasingly complex financing modalities and tight regional budgets. Against this background, the objective-orientated programming of RD policy becomes more important and the ministry representatives express a strong demand for decision support on practical resource allocation problems as well as strategy development.

The developed model accurately captures the resource allocation problem and provides a promising tool to guide resource allocation decisions at the program level; particularly because the ministry staff lacks appropriate models to cope with the highly complex European RD framework. In this context, the interactive design of the approach has been both a necessity (arising from the fact that the information to be fed into the model is mainly exclusively in the hands of the experts in the ministry) and a great means to facilitate internal communication and transparency within the ministry.

On the one hand, the interactive definition of the model contributed to an awareness building process regarding the key parameters of objective-oriented policy-making. The first model use, on the other hand, provided the opportunity to actually learn about implications of certain resource allocation decisions and trade-offs involved in a multi-objective decision environment. Hence, from our experience so far, it can be concluded that the priority setting exercise provided certain learning effects that will, in the long-term, trickle through and affect future resource allocation decisions.

From a conceptual point of view, the study showed that the active integration of DMs into the modelling process is a necessary precondition and that interactive programming is a powerful approach for policy decision-making support. Challenges arise from the demanding day-to-day policy business. Whereas the ministry expresses a strong demand for decision support, they equally encounter difficulties to bring the necessary resources into the process. Hence, the strain perceived by the coordinating and participating ministry representatives threaten to outweigh the rather intangible long-term effects described in this paper. This ‘costs versus benefits’ consideration is eventually going to be answered by the ministry after the envisaged model use. Nevertheless, an important question for our future research activities will be whether and how an improved efficiency can be achieved.

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