

PROPOSAL FOR A RESEARCH GRANT FROM THE DEUTSCHE FORSCHUNGSGEMEINSCHAFT (DFG)

1 General information

Proposal for a research grant, Renewal proposal

Subproject 10 within the DFG Research Unit: "Structural Change in Agriculture (SiAG)"

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1.2 Title

Policy Support for Rural Development and Structural Change using Interactive Programming

Keywords:

Policy-making support, rural development, interactive programming, impact analysis

1.3 Research area and field of work

Agricultural economics, agricultural and rural development policy analysis

1.4 Anticipated total duration

3 years, within the second phase of the Research Unit (first phase started at: 01.07.2008)

1.5 Application period

Date of the previous grant: 06.07.2007

Current funding for personnel will probably last until: 30.06.2011

Current funding for direct project costs is anticipated to last until: 30.06.2011

Application period: 01.08.2010 - 31.07.2013

1.6 Summary

Rural development (RD) policy has increasingly gained importance in the European Union (EU). Facing the specific problems and the complexity of this policy field, the basic research question is how policy decision-making for rural development can be supported effectively. The overall objective of the subproject is to provide and test a master programming framework for integrative rural development and structural change. The approach comprises key RD policy measures and is based on interactive programming. A first specific objective is to assess the impacts of RD policy measures carrying out an internet-based expert survey. The second specific objective is to develop an interactive programming tool focusing on measures, objectives and constraints and integrating relevant budgets and financing options into the approach. Based on the information provided and the tool developed the third specific objective, then, is to formulate RD strategy options for specific regions. A strategy working group will define scenarios and evaluate results for two regions in Germany for the post-2013 EU financing period. The analysis will sharpen the view on the power and applicability of interactive programming in RD policy support and further develop its theoretical foundations.

2 Starting point of the project

2.1 State of the art

In view of growing economic and demographic problems of rural areas and societal demands on the agricultural sector beyond production, rural development (RD) policy has gained importance in the European Union (EU). Under the Agenda 2000 the so called Second Pillar was created establishing RD policy as a policy field of its own in the context of the EU's Common Agricultural Policy (CAP). The importance of RD policy to explicitly guide structural change in rural economies in general and the agricultural sector in particular has been widely acknowledged. Due to the multi-sectoral and multi-objective nature of this policy field, and, thus, diverse stakeholders and diverging preferences, RD policy-making is a complex task. Moreover, RD policy is embedded into the multi-level system of the EU and other structural funds also affect the development of rural areas. Also, a rather weak knowledge of impacts of certain policy measures on objectives pursued fundamentally challenges policy-making.

Facing the specific problems and the complexity of the policy field, the basic research question for the subproject is:

How can policy decision-making for rural areas be supported effectively?

To answer this question research is needed in two major research fields. The first one is policy decision-making support. This is a broad research field, indeed, but the focus here will be more specific on model-based policy-making support and interactive programming since this is the basic methodological thrust of the subproject. The second research field addresses RD policy in general and within the EU context in particular and the focus here is on impact analysis since this is the prerequisite for decision-making support.

Against this background the following discussion of the state of the art for the subproject covers two research areas:

- a) Model-based policy-making support using interactive programming
- b) Impact analysis of rural development policy measures.

ad a) Model-based policy-making support using interactive programming

Scientific policy advice and its proper role in policy-making has always been a subject of heated debates. Key questions are what kind of impact, if any, scientific knowledge has on actual policy-making (e.g. Weiss 1999, Hertin et al. 2009), what kind of arena-specific factors and internal functional logics hinder or foster the science-policy interface (e.g. Haas 2004 or Kropp et al. 2008, Feindt et al. (2007) and Nieberg (2007) with respect to agriculture in Germany), and how the barriers to an effective dissemination and use of research can be overcome (e.g. Gottschick 2008, Scott 2000). Most often, the gaps of expectations, needs and offers between the policy arena on the one hand and science on the other is discussed in such analyses. “Missing practical relevance”, “purely technocratic approaches”, “linguistic foreclosure”, and “ignorance and unawareness of political workflows” are just a few of the widely stated complaints about scientific policy advice; on the other side, “institutional implementation barriers”, “instrumentalization of scientific expertise” or “a per se unwillingness to rationalize the policy mess” form the complement view (e.g. Thunert 2003, Kropp et al. 2008, Lompe 2006).

Given these concerns the vast literature on policy advice recommends that it is high time to overcome the view of the science-policy interaction “as two clearly separated systems with an interface in between to be bridged” (Gottschick 2008: 479). Rather, it is emphasized that the communication between scientists and politicians should be a “two-way conversation” (Weiss 1999: 483), that pure technocratic or decisionist linear approaches should be abandoned, and that promising approaches for policy support need to be based on continuous and regenerated interaction (Falk et al. 2006, Lompe 2006).

The tendency towards an increased interaction between science and policy and, thus, a higher user orientation of applied models for decision support is reflected by two research streams which the subproject incorporates: Model-based policy support in general and interactive decision support systems in particular.

Model-based policy support has mostly been policy support using relatively large and complex mathematical models which display whole economies or their sectors. There is a growing concern and awareness about the communication of results from complex models. Brockmeier et al. (2008), for instance, conclude that more pragmatic models and a consequent consideration of “the end users’ needs in all stages of the modeling exercise” should be a paramount goal (Brockmeier et al. 2008). Equally, Happe and Kellermann (2008) ascertain with regard to complex agent-based models considerable problems when it comes

to the communication of model results and input parameters and note that an alleviation of the “black-box”-character of complex models needs to take place in order to provide appropriate policy advice. In line with this, Bankes (1992) as well as Walker (2000a) question the usefulness of large predictive models for complex policy problems and advocate for an exploratory use of computer modeling.

In the research area of multi-criteria decision analysis (MCA) and within this field in particular in multi-objective programming (MOP), the tendency towards an increased interaction between science and policy evolved already in the 1970s when Russell Ackoff strongly criticized the technique dominated Operations Research (OR) philosophy and advocated for more participatory approaches. Zeleny (1980: 2) called this emerging shift from the mathematical aspects of MOP towards providing real decision support to the decision-maker a new “interactive philosophy of mathematical programming”. Along with this shift, research concentrated more on supporting each of the steps in decision-making processes (problem structuring, identification of criteria and alternatives, preference elicitation, choice modeling, solution implementation), on the users’ interface of models and on behavioral aspects (Korhonen 2005). From then on, approaches which allow for the involvement of the decision-maker into the decision process, so called interactive approaches¹, were promoted in MCA and MOP. A vast number of methodological and theoretical papers emerged (e.g. Vanderpooten 1989; Korhonen et al. 1992), as well as a smaller number of comparative studies (e.g. Aksoy et al. 1996) and real life applications. Early reviews of these studies have been provided by Olson (1992) and White (1990).

Interactive methods are classically presented as an iterative procedure in which dialogue phases (actively involving the decision-maker) alternate with phases of computation (executed by an analyst or a computer) (Ballesterio and Romero 1998, Wallenius 1991). They are believed to be “the most appropriate way in obtaining the preferences of a decision-maker” (Kok 1986: 97) and represent a learning process (e.g. on trade-offs between conflicting objectives) that permits the decision-maker to better understand the system being analyzed and, thus, to take better informed and sensible decisions. Further arguments in favor of interactive approaches are that through dialogue it is possible to set the focus on critical points and that convergence of opinions regarding critical parameters of the problem is possible (Kok 1986).

The main objective of interactive approaches is therefore not to find one optimal solution or to provide recommendations for direct courses of action. It rather lies in the improvement of decision-making quality and focuses on an improved structuring and transparency of the problem at hand (Boots and Lootsma 2000, Geurts and Joldersma 2001). Along with this, researchers come increasingly to the conclusion that especially to support decision-making in the public sector, simple, clearly defined and flexible models should be used (e.g. Munda 2004, Walker 2000b). Also, a lot more emphasis is needed on the initial formulation and structuring of the decision problem (e.g. Hajkowicz and Higgins 2008) and sensitivity analysis should be at centre stage (Kaliszewski 2004). Munda (2004), Papamichail and Robertson

¹ Interactive approaches are also called „interactive programming“, „interactive multicriterion procedures“, “interactive methods”. Equally, the notion of “decision support systems (DSS)” or “decision aids” have become common for interactive approaches (Zeleny 1980).

(2003) as well as Simon (1976) emphasize in this context that the quality of the decision process is the key for the subsequent quality of the decision(s) made. Hence, the present research in the area of decision-making support via interactive approaches increasingly focuses on process-orientated questions.

A number of theoretical as well as empirical studies underline the need for and potential of interactive approaches to integrate diverse stakeholders into the decision-making process. This integration of stakeholders has been shown to increase decision quality and to improve public acceptance of decisions made (Beierle 2002, Geurts and Joldersma 2001). Nevertheless, as Gamper and Turcanu (2007) point out, most of the existing studies focus on the integration of experts and/or government authorities only and do not integrate the public at large. Here, they identify one of the biggest future challenges for MCA approaches to gain increased legitimacy in governmental decision-making.

Other studies try to evaluate the effectiveness of a supported decision process and compare this to unaided decision(s) (e.g. McCart and Rohrbaugh 1989, Chun and Park 1998). Given the different outcomes of these studies, Lymayem et al. (2005) analyze the conditions for successful implementation of decision support systems. At present, further research is needed to understand how decision processes change when applying MCA approaches and to identify critical success factors in order to effectively implement interactive approaches.

Compared to the development of theoretical concepts in MCA and interactive MOP, the number of real world applications is generally still small, though, there is a growing number of applications in some public sectors. Most of them take place in environmental decision-making and natural resource management and in the health sector (Gamper and Turcanu 2007, Zanakis et al. 1995). A recent example can be found in Hajkowitz (2007, 2009) who used an interactively constructed MCA method of Compromise Programming (CP) to analyze the allocation of environmental funds amongst regions in Queensland, Australia. In agricultural resource management the literature on MCA applications is also rather rich. But, as the overview of references on MCA in agriculture provided by Bartolini et al. (2005) and the somewhat older review of MCA studies provided by Hayashi (2000) show, most of the multi-objective modeling approaches focus on cropping decisions at farm level and none of the existing studies deals explicitly with budget allocation problems in RD policy. Nonetheless, some studies deal with certain aspects related to the proposed research. Gomez-Limon and Atance (2004), for instance, use focus group discussions and the Analytical Hierarchy Process (AHP) to empirically derive and analyze the relative weights citizens assign to the various objectives of the CAP. From a methodological point of view they show that focus group discussions are an efficient and appropriate means to concretize and agree on a reasonably small number of objectives and criteria.

The multi-objective and multi-sectoral nature of the RD policy field enhances complexity in policy decision-making suggesting interactive MCA and MOP approaches. Nevertheless, there are only a few applications so far. The research team of one applicant has done pioneering work in this field and an overview of the results achieved is given in chapter 2.2. However, various factors contribute to the still existing gap between RD policy support needs and realities. A key factor is that RD policy is not a well-defined and separable policy field, but addresses objectives, measures, and constraints of several sectors and must consider

and integrate them. Another key factor is limited and uncertain impact information. The state of the art on RD policy impact analysis is presented in the following.

ad b) Impact analysis of rural development policy measures

RD policy has developed into a multi-faceted policy field in the EU and also in Germany. While in the EU context the Second Pillar of the CAP was introduced for RD policy under the Agenda 2000, the German government, in 2009, passed a strategic paper on the further development of rural areas (Bundesregierung 2009) which demonstrates that many policy fields besides the Second Pillar are relevant for the development of rural areas. During the last decades rural areas in Germany and in the EU have become much more heterogeneous², which is a challenge for policy-making and which increases the need for targeting RD measures (Copus et al. 2007).

The assessment of impacts of RD policy measures is widely acknowledged as a key problem for RD policy-making. This is a challenging task for various reasons:

- Multiple objectives: The evaluation of RD policy measures is facilitated by clearly stated and operational objectives. However, these often do not exist: “rural development objectives are often very general in nature” (OECD 2009: 5, ERH 2006).
- Heterogeneity of policy measures: RD policy covers a broad range of different measures. Already the measures of the European Agricultural Fund for Rural Development (EAFRD) are quite different across the four axes (1: Competitiveness, 2: Land management, 3: Wider rural development, 4: Leader) and also within an axis. Whereas there are many studies to analyze the impact of specific measures on the objectives stated for the respective measure there are only few studies analysing the impacts of overall RD programs.
- Importance of other factors: RD policies are only one factor among many influencing the development of rural areas. This often makes it difficult to isolate the gross and particularly the net effects of particular measures from contextual effects (OECD 2009).
- Time lag: The evaluation of RD programs is hampered by differing time horizons of different measures.
- Definition and delimitation of rural areas: Analysing the impact of RD measures on rural areas requires both to define the term “rural” and to delimitate rural from non-rural areas (cf. Copus et al. (2006, 2008) for an overview on different definitions and characteristics and typologies of rural areas in the EU). The (growing) heterogeneity of rural areas in Germany as well as in the EU aggravates impact analyses for the whole of rural areas. Weingarten et al. (2009) show for the EU how purpose-specific typologies of rural areas can support model-based territorial impact assessments, and, thus, help to overcome the problem of regional heterogeneity.

² See Copus et al. (2006, 2008) for an overview on definitions of the term „rural“ and characteristics and typologies of rural areas in the EU.

The reasons discussed above underline that there are basically two major problems for RD policy impact analysis: the lack of a coherent theory and the lack of adequate methods for analyzing RD policies.

Lack of a coherent theory

There are a number of theories or models which try to explain rural or regional development. For example, Terluin (2003) distinguishes traditional models (e.g. neoclassical growth theory), pure agglomeration models (e.g. New Economic Geography models), local milieu models (e.g. endogenous growths models) and territorial innovation models (e.g. Theory of the innovative milieus). For an older overview on regional economic theories, see e.g. Krieger-Boden (1995).

In social science based literature on rural development the importance of rural governance, networks and social capital has gained prominence. In 1998, Goodwin (1998: 5) stated “an increasingly noticeable silence at the centre of contemporary rural studies concerning the ways in which rural areas are governed”. However, in recent years governance was stressed in many studies as an important determinant for rural development (e.g. Fürst 2004, Dwyer and Findeis 2008 or the OECD 2006 in its new paradigm of rural development). Benz and Meincke (2007) provide an overview on regional science approaches to analyze governance structures (cf. Elbe 2007, Fürst 2007). There is also a growing literature on the importance of social capital and networks for rural development. Examples on EU-level are the “Dynamics of Rural Areas (DORA)” project (Bryden and Hart 2004) and the “Restructuring in Marginal Rural Areas (RESTRIM)” project (Lee et al. 2005, Arnason et al. 2009) which both analyze different case studies in a more qualitative way. In a thematic issue of “Sociologia Ruralis” (Ray 2000) sociological analyses focussing on Leader case studies are presented which are based on endogenous and participatory developments. More recent studies on “Leader” and “Regionen Aktiv” stress the importance of regional governance (Fürst 2004, Fürst et al. 2006, Pollermann 2006, 2008).

System concepts in evaluation play a more prominent role particularly in the United States. Williams and Iray (2007) provide an overview on their application in different policy fields. Heintel (1998, 2000, 2004) and Lukesch (1999) applied systems-theoretical ideas for analyzing processes of regional development. From a system-theoretical point of view – in contrast to many rigorous impact assessment methods – it is important that the evaluation of interventions into complex systems cannot deliver valid and generalizable results without detailed knowledge of the relevant interdependencies within the system. According to the system theory paradigm there are structural regularities but no constant parameters in social systems.

Despite different theoretical strands explaining rural development, there is still a lack of a consistent theory of rural or regional development (Maier and Tödtling 2002). With regard to the evaluation of RD policies the OECD (2009: 6) concludes in its report “Methods to monitor and evaluate the impacts of agricultural policies on rural development”: “The main problems outstanding arise from lack of knowledge of the causal pathways associated with different measures, and the difficulty of identifying their impacts on a territorial basis.”

Lack of adequate methods for analyzing RD policies

There are many methods adequate for analyzing the impact of specific RD policy measures, however, there is a lack in methods for analyzing RD policies in total. Available methods can be broadly grouped into quantitative and qualitative approaches.

Copus et al. (2008) provide an overview on quantitative economic models to analyze the impact of EAFRD measures, grouped into seven groups of measures, and an overview on selected applications of these models. The overview comprises Human Capital models, Partial Equilibrium models, Mathematical Programming, Agent based models, Computable General Equilibrium models, Keynesian Multiplier Analysis, Regional Input-Output and Social Accounting Matrices, Gravity models, Shift-share Analysis, Econometric Residential Choice Models, Economic Base Models, Innovation Milieu Models, and New Economic Geography Models. Based on experiences in labor market evaluations, there is a growing attention on counterfactual analyses also in RD impact analyses, particularly for sector-related measures. For example, Pufahl and Weiss (2009) used propensity score matching for evaluating the effects of farm programs.

Qualitative approaches are common in RD evaluation studies for the European Commission to reflect on intervention logics and to detect impact interlinkages. These studies are often based on different social science methods like case studies, beneficiaries and stakeholder interviews, and participatory observations. These methods are appropriate to analyze specific research questions. A special kind of qualitative approaches are Delphi surveys which aim at condensing expert knowledge.

Internet-based surveys have gained importance during the last years and are becoming an important research tool. Vehovar and Lozar Manfreda (2008) provide a recent overview on methodological aspects of such surveys and observe them within the broader context of computer assisted survey information collection. Best and Krueger (2008) give advice how to design internet surveys (see also Dillmann 2000). An example for an internet-based expert survey (Delphi approach) focussing on evaluation is Balzer (2005) who surveyed evaluation experts about the preconditions for successful evaluation.

Summarizing the state of the art on model-based policy-making support using interactive programming and impact analysis of rural development policy measures two main conclusions may be drawn: there is a definite need to further improve impact assessment as a prerequisite for better RD policy decision- making support, and there is the need to develop an integrated regional perspective in this policy field. Following these conclusions, to develop such an approach is the basic thrust of the proposed subproject.

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2.2 Preliminary work by this research group (including project development report)

The subproject brings together the expertise of the two applicants and their teams at the Chair for Agricultural Policy at Humboldt-Universität zu Berlin and the Institute of Rural Studies at the von Thünen-Institute at Braunschweig. There is a broad experience on RD policy analysis in both institutions. Research at Humboldt-Universität, in particular, has focused on model-based policy decision-making support and interactive programming. The von Thünen-Institute, on the other hand, has a broad experience on impact analysis and evaluation of RD policies. Hence, extensive work has been done by the research group on both relevant research areas of the subproject.

There is a profound knowledge within the research group on RD policy in general. Both the applicants and team members have extensively published on several aspects concerning the RD policy field. Kirschke et al. (2005), Kirschke and Weber (2004), Grethe et al. (2005, 2006, 2007), Häger and Kirschke (2007) and Fährmann et al. (2008) continuously analyzed and monitored the reform process of the CAP and its reorientation towards a policy for rural areas. Grajewski (2005) and Weingarten (2008) particularly analyzed the present regulatory framework in European RD policy and Copus et al. (2008) analyzed and reviewed approaches to rural typology. Furthermore, members of the research group gained profound experience in RD program evaluation (e.g. Grajewski and Schrader 2005, Kirschke et al. 2006).

Preliminary work at Humboldt-Universität zu Berlin

Some substantial preliminary work has been done on policy decision-making support and on programming approaches at Humboldt-Universität. Early studies on priority setting in agricultural research are to be found in Kirschke (1986), Jechlitschka and Kirschke (1995) and Gierend (1998). These contributions condensed to different methodological approaches which are further illustrated in Kirschke and Jechlitschka (2002) and Jechlitschka et al. (2007). Here, as well as in Kirschke and Jechlitschka (2003) the methodological foundations for more recent studies on budget allocation and priority setting and the use of linear programming in spreadsheet programs were built. Kirschke et al. (2004a and b) and Wegener (2005) extended this approach in the context of the DFG Research Unit 497 on “Structural Change and Transition in agriculture (SUTRA)” (Kirschke et al. 2007b) to an interactive method and applied it to an agro-environmental decision-making problem in the Ministry of Agriculture and the Environment in Saxony-Anhalt. To the authors’ knowledge, this was a first exercise of policy decision-making support in RD using interactive programming. The research team was also able to quantify and assess the distortions resulting from the present European and German co-financing system (Kirschke et al. 2007a, 2006, 2004c) and Wegener (2008) explored ways to stochastically deal with uncertain input parameters in the model.

Additional theoretical and empirical work on RD policy decision-making support has been conducted on problem settings in a wider European context. Pohl (2001), for instance, used the Analytical Hierarchy Process (AHP) to interactively analyze Latvian RD strategies. More recently, Wegener and Kiryluk (2008) analyzed priority setting from a farmers’ point of view for the present Polish RD program. Ziolkowska used a programming approach for analyzing agro-environmental policy in Poland. In her PhD thesis (Ziolkowska 2007) she particularly discussed preference heterogeneity in decision-making and the role of regional stakeholder priorities. Based on these results, Ziolkowska (2008) compared the AHP and cost-effectiveness analysis for policy decision-making support and examined potential negative side effects for farmers from the implementation of agro-environmental measures (Ziolkowska 2009).

Subproject development report

Extending interactive programming to the broader RD policy context in Germany is the main perspective of the ongoing work in the first phase of the SiAg Research Unit. The subproject was prepared by a master thesis of the current research assistant (Schmid 2008) and started in July 2008 which was rather late in the context of the DFG Research Unit. The overall objective of the current research is to develop and test a broader interactive programming approach for the EAFRD in Saxony-Anhalt. Following the successful cooperation in the SUTRA Research Unit, the partner again is the Ministry of Agriculture and the Environment in this country.

So far, six meetings with representatives from the Ministry of Agriculture and the Environment took place in which the structure and the input parameters of the model were discussed. With regard to the 36 policy measures considered, particular emphasis had to be put on the formulation on complex financing modalities. As a result, the model does not only include the EU, the national and the regional financial obligations for each policy measure but further incorporates the communal level. Moreover, different financing modalities such as

the possibility to additionally allocate funds to a measure without co-financing by the EU, so called “national top-ups”, are considered. Considerable effort was put on incorporating key financial constraints into the model, e.g., the minimum contributions of EAFRD funds to the axes or the available budget at different administrative levels. Hence, the model offers the possibility to realistically model and strategically revise an entire EAFRD program at regional level.

With regard to objectives, three official regional objectives are considered: economic development of rural areas (1), creation of employment opportunities in rural areas (2) and environmental protection and nature conservation (3). Given the debate about ever increasing administrative burdens, mainly due to the EUs’ Integrated Administration and Control System (IACS), administrative efficiency was considered as a fourth objective in the model. Concerning policy impacts on these objectives, the methodological approach was rather pragmatic: Executing a two-step Delphi approach, representatives from nearly all departments of the Ministry of Agriculture and the Environment involved in RD policy administration, in a first step, estimated impacts on a 1-9 scale via emailed scorecards and, subsequently, agreed upon them in a collective workshop.

The results show a rather diverse picture. Whereas the arithmetic means of the estimated impact parameters with regard to objectives 1 and 2 are the highest in axis 1 (Competiveness), they are the lowest in axis 2 (Land management). Here, the Ministry representatives estimated the highest impacts with regard to the objective of environmental protection and nature conservation (objective 3). The measures in axis 2 also got the lowest scores with respect to the objective of administrative efficiency (objective 4). The reason is that in this axis most measures involve area or animal based payments which cause higher administrative burdens than, e.g., investment support for private beneficiaries (predominant in axis 1). Concerning the funds directed to Leader groups, the Ministry representatives agreed upon a ten percent higher objective coefficient (compared to the normal implementation of the respective measure) with regard to objectives 1 to 3 and a ten percent lower objective coefficient with regard to the fourth objective of administrative efficiency. According to the Ministry representatives, this higher administrative burden of measures implemented by Leader groups mainly results from a lack of experience and skills of Leader managers. Hence, Leader applications still require a substantial administrative effort with regard to additional instructions and considerable post-processing.

The interactive modeling together with representatives from the Ministry is to be executed yet. A particular focus will be put on limited regional budgets and the expected loss of the “objective 1 status” of Saxony-Anhalt in the next funding period. The documentation and discussion of the process itself and preliminary results of the first computations undertaken are to be found in Schmid et al. (2010).

An important perspective for the upcoming research within the remaining first funding period of the subproject is the analysis of communal co-financing obligations and their implications for structural change in the rural economy. Furthermore, the impact parameters derived by expert judgments shall be compared and assessed against research findings of other subprojects. The research results of subproject 9 (Petrick) are of particular relevance. The econometric panel data analysis casts some doubts on the overall economic effects of CAP measures in general and RD policy in particular. This is a substantial result for the discussion

in the expert group. On the other hand subproject 10 delivers more disaggregated and differentiated qualitative results on impact coefficients which are used by subproject 9 to assess the quantitative results achieved. The perspective in the ongoing research work is to merge the results leading to a joint discussion on RD impact assessment with stakeholders and experts in the Ministry of Agriculture and the Environment in Saxony-Anhalt.

In a similar way subproject 10 benefits from inputs from other subprojects. Subproject 5 (Balmann/Mußhoff) contributes to the understanding of farmers' behavior under different policy frameworks and subprojects 1 (Schade) and 2 (Odening) help to assess farmers' behavior with respect to investment decisions. Such research results and information allow, e.g., for better impact assessment of policy measures related to farmers' investment decisions such as payments for the modernization of agricultural holdings. The focus of these subprojects on bounded rationality in individual decision-making generally contributes to more realistically reflect and improve policy impact analysis.

Subproject 10 develops various scenarios for rural development policies under the EAFRD which may have different implications for structural change in rural areas and the agricultural sector. The discussion of such scenarios supports other subprojects to better assess the relevance of the policy framework in their research. Subproject 5 (Balmann/Mußhoff) is an important addressee of such policy scenario discussions as this subproject directly examines different policy scenarios in the agent-based modeling approach.

Volatile agricultural markets have become a new topic in the discussion on the future CAP. In fact, agricultural price volatility has increased due to the liberalization of markets and increasing world market price instability. As a result, risk management has become a new and relevant topic both for farmers and policy makers. From a political point of view the new questions are whether and to what extent stabilization policy should become an element of the future CAP. Such questions have been analyzed in a joint research effort by subprojects 2 (Odening), 7 (Grethe/von Witzke) and 10 (Kirschke). In particular, yield and price volatility of selected agricultural products in Germany and the EU have been examined. Potential implications are discussed from a managerial and a policy perspective (Artavia et al. 2010). A comprehensive discussion of policy implications is given in Kirschke and Häger (2010).

Preliminary work at von Thünen-Institut

Research experience on RD policy at the Institute of Rural Studies goes back to the 1990s when several evaluation studies were carried out and methodological approaches for analysing RD measures were developed. Quantitative approaches like matching were used to assess impacts of sector-specific measures (Pufahl 2008, Pufahl and Weiss 2007, 2009). Margarian (2007) uses Structural Equation Models to reflect heterogenous starting conditions of regions in such analyses. Based on cost comparisons and integrating implementation cost, efficiency analyses have been carried out for various RD policy measures (Fährmann and Grajewski 2008). Equally, ecological efficiency analyses have been carried out for agro-environmental measures (Reiter et al. 2008). Using a panel model the impact of agro-environmental measures on grassland use was analyzed (Pufahl and Fährmann 2008). Summarising, various quantitative methods were developed and used for assessing impacts of RD measures.

The Institute of Rural Studies has a long experience in evaluating RD programs. In the programming period 2000-06 it evaluated the RD programs of six Bundesländer (Grajewski 2005, 2008; Grajewski and Schrader 2005) as well as the less favoured area payments for all Bundesländer (Plankl and Schrader 2004, Plankl et al. 2008). In the ongoing programming period the Institute is responsible for the evaluation of the RD programs of seven Bundesländer.

Two projects funded by the European Commission focussed on spatial impact assessments (SIA) of RD measures. Copus et al. (2008) discussed rural typologies and economic models and how they can be used for SIA. Weingarten et al. (2009) developed a set of regional typologies (at NUTS-3 level) which provide a suitable basis for SIA as shown by the analysis of the impact of two selected Axis 3 RD measures using regional Input-Output Models. The ongoing 7th FP project CAPRI-RD (Common Agricultural Policy Regional Impact – The Rural Development Dimension) aims to develop and apply an operational, Pan-European tool to analyze the regional impacts of all policy measures under CAP Pillar I and II across a wide range of economic, social and environmental indicators, aligned with the EAFRD Common Monitoring and Evaluation Framework (CMEF). The Institute of Rural Studies contributes to the development of an EU-wide database on RD policies and indicators, to the further development of the CAPRI model and to a comparison of the impact assessment of selected EAFRD measures based on CAPRI-RD with the results of evaluation reports of those measures.

Weingarten was one of the main authors of the “Future of Rural Areas in an Enlarged EU” report (European Commission 2004) and significantly contributed to the “Study on Employment in Rural Areas” (Copus et al. 2006). The ongoing ESPON project “European Development Opportunities (EDORA)” aims at better understanding the development opportunities and challenges facing diverse types of rural areas in Europe.

Internet based survey experience Weingarten

List of relevant publications³

a) in scientific journals (peer-reviewed)

- Grethe, H., Häger, A., Kirschke, D. (2005): Aspekte der Agrarpolitik 2004. *Agrarwirtschaft* 54 (1): 1-13.
- Grethe, H., Häger, A., Kirschke, D. (2006): Aspekte der Agrarpolitik 2005. *Agrarwirtschaft* 55 (1): 1-10.
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- *Häger, A., Kirschke, D. (2007): Politik für den ländlichen Raum 2007+. *Raumforschung und Raumordnung* 65 (4): 275-287.
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- *Kirschke, D., Häger, A., Jechlitschka, K., Wegener, S. (2007a): Distortions in a multi-level co-financing system: the case of the agri-environmental programme of Saxony-Anhalt. *Agrarwirtschaft* 56 (7): 297-304.

³ Publications resulting from the previous funding period of the research group are indicated by *

- Kirschke, D., Jechlitschka, K. (2003): Interaktive Programmierungsansätze für die Gestaltung von Agrar- und Umweltprogrammen. *Agrarwirtschaft* 52 (4): 211-217.
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- *Ziolkowska, J. (2008): Evaluation of agri-environmental measures: Analytic Hierarchy Process and cost-effectiveness analysis for political decision-making support. *International Journal of Rural Management* 4 (1-2): 1-24.
- *Ziolkowska, J. (2009): Environmental benefit, side effects, and objective-oriented financing of agri-environmental measures: case study of Poland. *International Journal of Economic Sciences and Applied Research* 2 (1): 71-88.

b) at major scientific conferences

- Grajewski, R., Schrader, H. (2005): Design, results and lessons from program evaluation: evidence from the mid-term evaluation of six rural development programmes in Germany. In: Ortner, K.M. (ed.): *Assessing rural development policies of the Common Agricultural Policy: selection of papers from the 87th Seminar of the European Association of Agricultural Economists (EAAE)*. April 21-23, 2004, Wien, Austria. Wissenschaftsverlag Vauk, Kiel: 233-250.
- Kirschke, D., Häger, A., Jechlitschka, K., Wegener, S. (2004b): Priority Setting for Rural Development: An Interactive PC-Based Programming Approach. In: Petrick, M., Weingarten, P. (eds.): *The Role of Agriculture in Central and Eastern European Rural Development: Engine or social buffer? Studies on the Agricultural and Food Sector in Central and Eastern Europe* 25. Institut für Agrarentwicklung in Mittel- und Osteuropa, Halle (Saale): 398-412.
- Wegener, S. (2005): Interaktive computergestützte Modellierung für die Gestaltung von Agrarumweltprogrammen – Ein Programmierungsansatz zur Entscheidungsunterstützung in Sachsen-Anhalt. In: Hagedorn, K., Nagel, U.J., Odening, M. (Hrsg.): *Umwelt- und Produktqualität im Agrarbereich*. Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaus e.V. 40, Landwirtschaftsverlag, Münster-Hiltrup: 225-235.
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c) Monographs

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- Jechlitschka, K., Kirschke, D., Schwarz, G. (2007): *Microeconomics using Excel – Integrating economic theory, policy analysis and spreadsheet modelling*. Routledge, London, England.

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- *Ziolkowska, J. (2007): Agrar-Umweltpolitik in Polen nach dem EU-Beitritt: Bewertungs- und Gestaltungsansätze und Fallstudie für die Wojewodschaft Vorkarpaten. Berliner Schriften zur Agrar- und Umweltökonomik 12. Shaker Verlag, Aachen.

d) Other publications

- Copus, A., Hall, C., Barnes, A., Dalton, G., Cook, P., Weingarten, P., Baum, S., Stange, H., Lindner, C., Hill, A., Eiden, G., McQuaid, R., Grieg, M., Johansson, M. (2006): Study on Employment in Rural Areas. Study prepared for the European Commission, DG Agri. Available at http://ec.europa.eu/agriculture/publi/reports/ruralemployment/sera_report.pdf
- Copus, A., Psaltopoulos, D., Skuras, D., Terluin, I., Weingarten, P. (2008): Approaches to Rural Typology in the European Union. JRC Scientific and Technical Reports, Luxembourg. Available at <http://ftp.jrc.es/EURdoc/JRC48464.pdf>
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- Fährmann, B., Grajewski, R., Koch, B., Peter, H. (2008): Die Politik zur ländlichen Entwicklung im Rahmen der Gemeinsamen Agrarpolitik - von den Ursprüngen bis zur Gegenwart. Schriftenreihe Europäisches Verwaltungsmanagement der Fachhochschule für Verwaltung und Rechtspflege Berlin, Berlin.
- Grethe/Artavia**
- Grajewski, R. (2005): Gestaltung und Umsetzung der ELER-Verordnung aus Sicht der Wissenschaft/Evaluation. Schriftenreihe der DLKG 3.
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- Kirschke, D., Häger, A., Grams, M. (2005): Fragen und Optionen zur Zukunft von Agrarpolitik und Agrarfinanzierung in der Europäischen Union. In: Bundesministerium der Finanzen (BMF) (Hrsg.): *Monatsbericht des BMF 10-2005*: 85-98.
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3 Project Description (objectives, methods, work schedule)

3.1 Objectives

The basic research question for the subproject is how policy decision-making for rural development and structural change can be improved. The perspective is to provide model-based policy-making support using interactive programming. The discussion of the state of the art in the relevant research fields and the preliminary work of the research group have shown that this is a promising perspective, yet some key research questions still have to be solved. A major shortcoming still is the limited knowledge on impacts and targeting of RD policy measures. Despite the considerable work done in this field, this remains a key problem for the RD policy field. Furthermore, the programming approaches provided so far just

capture the characteristics of specific policy questions like the implementation of agro-environmental measures or the allocation of EAFRD funds. There is still a lack of a general framework for interactive RD policy-making support that goes beyond such specific approaches. A more general framework should concentrate on key elements of the RD policy field and serve as a methodological base for various policy-making problems. Finally, the dialogue with policy decision-makers in various projects has shown that there is a need for policy support but limitations in this dialogue have to be faced. Time and capacity constraints as well as the short time horizon in day to day policy business often hamper an intensive dialogue. There is a strong demand, however, for a more long-term orientation in the policy dialogue and strategy development support.

Against this background the general objective of the subproject is to provide and test a master programming framework for integrative rural development and structural change. The subproject shall bring together the experience in the research field and explicitly address the open questions discussed. The following specific objectives are pursued:

- to assess the impact of RD policy measures
- to develop an interactive programming tool
- to formulate RD strategy options for specific regions.

The project will start with a broad expert survey to assess impacts of RD policy measures condensing the know-how and experience of experts in the field. This survey should comprise major measures of the EAFRD, but also include measures of the European Regional Development Fund (ERDF) and the European Social Fund (ESF) which also effect rural development. Using these results a programming tool will be developed. This will be a general methodological framework supporting RD policy-making focusing on key measures, objectives and constraints. The tool will be used within the subproject to elaborate on strategic options for RD policy-making in the EU financial period 2014-2020. Two specific German regions, Saxony-Anhalt and [REDACTED], will be dealt with in detail. The master programming approach developed and tested in the subproject may guide future RD strategy development and policy-making support in various regions.

3.2 Methods

According to the specific objectives pursued the subproject will comprise several methods. The assessment of impacts of RD policy measures will first be based on an internet expert survey trying to reveal the accumulated knowledge in this field. The interactive programming tool to be developed will be based on Excel and will use Parametric Linear Optimization. Solver-based Visual Basic Applications (VBA) will help to support the interactive use and to visualize results and simulations. Finally, a strategy working group will be formed comprising researchers from the DFG Research Unit, external experts and representatives from the regions. The strategy working group will accompany the development of the programming tool and use this tool for scenario calculations and strategy development.

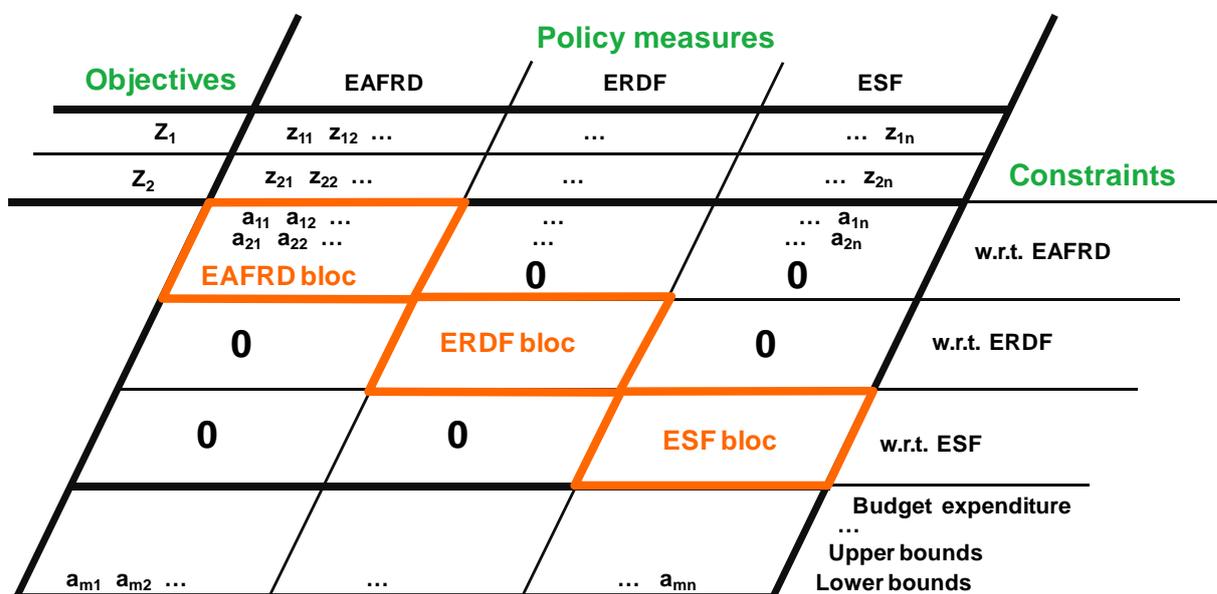
The internet-based survey should help to provide a comprehensive understanding of causal links between RD policy measures and their effects on various objectives. The idea is to use existing qualitative expertise of people working in the field of RD analysis and evaluation, administration and management. Using the internet for this perspective seems to be most suitable as has been outlined in the discussion of the state of the art above. A particular

challenge will be the handling of diverging views on impacts and uncertainty associated with expert knowledge. To address and analyze the multivariate nature of the data obtained regression analysis and multivariate analysis techniques will be applied to better understand RD impact assessments and results. The findings will also be compared to existing knowledge on impacts based on quantitative econometric approaches.

The interactive programming tool to be developed will capture major elements of RD policy-making and uses Excel to facilitate interactive use. The approach is visualized in figure 1. The matrix to be defined comprises major measures of EAFRD, ERDF and ESF, the objectives pursued and the constraints to be considered. The bloc-wise presentation of the matrix indicates that there are fund-specific constraints as well as constraints with respect to all funds.

Key features of the interactive programming approach are that it allows for “real time” calculations and “soft modeling” with actors which, in this case, are the members of the strategy working group. The working group will help to define and use the model. The first step comprises the definition of relevant objectives and policy measures, the integration of impact coefficients, and the formulation of relevant policy constraints for the case studies. The second step comprises scenario calculations, the assessment of key exogenous factors for policy-making, and strategy choice as well as sensitivity analyses.

Figure 1: Structure of the Programming Approach



The strategy working group will comprise members of the research team from Humboldt-Universität and von Thünen-Institute and members from the DFG Research Unit. It will be supplemented by external experts in the field of structural and RD research and two representatives from each of the case study administrations. The strategy working group will

comprise 15 to 18 persons. The work will be organized in workshops using focus group discussions.

3.3 Work Schedule

The work schedule of the subproject comprises four phases. In the first phase the theoretical foundations for the approach will further be deepened and the strategy group will start its work defining objectives and procedure. Equally, the options for the survey design will be discussed and agreed upon. In the second phase the internet-based survey will be carried out. The third phase comprises model development and application. The strategy group will support model design and the results from the survey have to be integrated. The strategy group will then use the model for scenario calculations and assess the results. In the fourth phase the results will be published and disseminated. An overview of the four phases and the time schedule is given in Figure 2.

4.2 Scientific instrumentation

- not applicable -

4.3 Consumables

Consumables will be provided by Humboldt-Universität zu Berlin.

4.4 Travel

2010	Coordination and survey design (Berlin, Braunschweig)	450 €
	Meetings with representatives from the case study regions (Saxony-Anhalt,)	400 €
	Periodic research seminar meetings (Braunschweig, Halle, Stuttgart)	300 €
	First meeting of strategy group (model framework) (Liebenberg, 17 persons)	2.000 €
2011	Coordination (Berlin, Braunschweig)	500 €
	Meetings with representatives from the case study regions (Saxony-Anhalt,)	400 €
	Periodic research seminar meetings (Braunschweig, Halle, Stuttgart)	600 €
	Second meeting of strategy group (model design) (Berlin, 17 persons)	1.500 €
	Contributions to national and international conferences:	2.000 €
	- German Association of Agricultural Economists (GeWiSoLa), Annual meeting	
	- European Association of Agricultural Economists (EAAE) XIII th Congress (Zurich, Switzerland)	
2012	Coordination (Berlin, Braunschweig)	500 €
	Meetings with representatives from the case study regions (Saxony-Anhalt,)	600 €
	Periodic research seminar meetings (Braunschweig, Halle, Stuttgart)	600 €
	Third and fourth meeting of strategy group (scenario calculations & assessment of results) (Berlin and Liebenberg, 17 persons)	3.500 €
	Contributions to national and international conferences:	4.000 €
	- GeWiSoLa Annual meeting	
	- IAAE 2012 Triennial Conference	
	- AAEA Annual Meeting	
2013	Coordination	250 €
	Periodic research seminar meetings (Halle, Braunschweig, Stuttgart)	300
	Contributions to national and international conferences:	2.000 €
	- GeWiSoLa Annual meeting	
	- IAMO Forum Halle	

- AAEA Annual meeting

Total 4.4 **19.900 €**

4.5 Publication expenses

Overall 750 € per year 2.250 €

Total 4.5 **2.250 €**

4.6 Other costs

2010	First meeting of strategy group (Liebenberg, 17 persons)	2.720 €
	Cost of internet-based expert survey	3.000 €
	Purchase of special literature	250 €
2011	Second meeting of strategy group (Berlin, 17 persons)	1.850 €
	Purchase of special literature	250 €
2012	Third meeting of strategy group (Berlin, 17 persons)	1.850 €
	Fourth meeting of strategy group (Liebenberg, 17 persons)	2.720 €
	Total 4.6	12.640 €

Sum of costs - 4 -

Cost category	2010	2011	2012	2013	Sum
Staff costs (4.1)	16.500	33.000	33.000	16.500	99.000
Scientific instrumentation (4.2)	0	0	0	0	0
Consumables (4.3)	0	0	0	0	0
Travel (4.4)	3.150	5.000	9.200	2.550	19.900
Publication expenses (4.5)	0	750	750	750	2.250
Other costs (4.6)	5.970	2.100	4.570	0	12.640
Sum	25.620	40.850	47.520	19.800	133.790

5 Prerequisites for carrying out the project

5.1 Composition of the group

The research group working in the subproject includes the following persons:

a) Financed by means of the applicants' institutions:

(at Humboldt-Universität)

- Prof. Dr. Dr. h.c. Dieter Kirschke, Head of the subproject
- Dr. Astrid Häger, Senior researcher
- Dr. Kurt Jechlitschka, Senior researcher
- Julia Christiane Schmid, PhD Student
- Kerstin Oertel, Technical assistant

(at von Thünen-Institute)

- Prof. Dr. Peter Weingarten, Head of the subproject
- Regina Grajewski, Senior researcher

b) Financed by third parties – non DFG:

Dr. Jadwiga Ziolkowska

Dr. Ziolkowska has gained a Marie Curie International Outgoing Fellowship granted by the EU Commission and currently works at the University of California, Berkeley. With her focus on RD policy decision-making, she will continue to support the research group.

5.2 Cooperation with other scientists

Cooperation within the DFG Research Unit

Several subprojects within the DFG Research Unit explicitly or partly address RD policy and these subprojects will continue to be of particular importance for subproject 10. Subproject 9 (Petrick) analyzes CAP impacts with an econometric panel data approach and the results will allow to compare and assess some expert survey results of subproject 10. Dr. Petrick, head of subproject 9, will directly support subproject 10 as a member of the strategy group. Some projects on the farm level will help to assess farmers' reactions to specific RD policy measures, thus, contributing to a better understanding of impacts. In this respect, subproject 1 (Schade), subproject 2 (Odening/Hüttel) and subproject 3 (Mußhoff) will be of particular relevance.

Both subproject 5 (Balmann/Larsen) and subproject 10 will use expert judgment for the modeling approaches. They will benefit from mutual experience on the design of stakeholder and expert workshops, once on a community level combining farmers, officials and other stakeholders (subproject 5) and once on an aggregated policy-making level (subproject 10). The subprojects will directly support each other by participating in the respective expert groups. Hence, Dr. Balmann will be a member of the strategy group of subproject 10 and Dr. Häger will participate in the stakeholder workshops of subproject 5. Moreover, major activities of both subprojects relate to Saxony-Anhalt allowing for further synergy effects.

Beyond the basic perspective of subproject 10, there is a specific interest in a new cooperation with subproject 1 (Schade) with respect to RD policy-making. The idea is to design an experiment to get insights into rational policy-making for RD. The question is whether farm-level experiments can reasonably be extended to the policy level and whether they can help to assess the relevance of the interactive programming approach as proposed in the subproject.

Cooperation outside the DFG Research Unit

Several external experts on structural policy analysis and RD policy will be members of the strategy working group, thus, directly supporting the subproject. This will be Helmut Karl (Ruhr University Bochum) and Gerhardt Untiedt (Technical University Clausthal and GEFRA Consult) with special expertise in regional policy analysis. Steffen Noleppa (agripol), Stefan Wegener (IAMO) and Klaus Müller (ZALF) have done extensive work on RD policy analysis and will also be members of the strategy working group. The group will finally benefit from representatives from the case study regions Saxony-Anhalt and

The subproject will also benefit from extensive ongoing research cooperation on RD policy with German and European partners. Among the partners are Wolfgang Britz (University of Bonn), Andrew Copus (Nordregio/Sweden and UHI/UK), Thomas Dax (Institut für Bergbauernfragen/Austria), David Meredith (TEAGASC/Ireland), Mark Shucksmith (University of Newcastle/UK). Furthermore, there is a fruitful cooperation with other evaluation teams EU-wide and in Germany. The active collaboration in the Evaluation Society (DeGEval, Gesellschaft für Evaluation) contributes to an exchange of evaluation methods and results among other policy fields with a special emphasis on structural/regional policies.

5.3 Scientific equipment

The implementation of the subproject basically requires a work place with a PC for the research assistant and an appropriate working environment for the student assistant. The provision of the specific facilities is ensured by the Chair for Agricultural Policy at Humboldt-Universität zu Berlin. The research assistant will equally have an appropriate working environment during his/her stay at von Thünen-Institute.

5.4 Running costs for materials

The estimated expenses for the project (phone, fax, postage, fees, material consumption) amount to approximately 900€/year. These expenses will be covered by the budget of the Humboldt-Universität zu Berlin.

5.5 Conflicts of interest with commercial activities

- not applicable -

5.6 Other requirements

Library, computer and media center, internet access and other infrastructure of the University may be used by the members of the subproject without any restriction.

6 Declarations

6.1 We have not requested funding for this project from any other sources. In the event that we submit such a request, we will inform the Deutsche Forschungsgemeinschaft immediately.

6.2 The trustee of the Deutschen Forschungsgemeinschaft at Humboldt-Universität zu Berlin, Prof. Dr. Bärbel Friedrich, has been informed about this application.

7 Signatures

Berlin, 01.03.2010

(Prof. Dr. Dr. h.c. Dieter Kirschke)

(Prof. Dr. Peter Weingarten)