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## Promoting the multifunctionality of agriculture, forestry, and rural areas - design and implementation of public policies in Germany

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# UFZ-Discussion Papers

Department of Economics

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## Promoting the Multifunctionality of Agriculture, Forestry, and Rural Areas – Design and Implementation of Public Policies in Germany

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**Abstract:**

The multiple roles and functions of agriculture and forestry beyond those of supplying food and fibre, such as the provision of environmental benefits and the contribution to the socio-economic viability of rural areas, account for a growing recognition in both scientific debates and political decision making. In order to foster further research in the field of multifunctionality of agriculture, forestry, and rural areas, this report provides an overview of the scientific work that has been done with respect to the different ways and goals of setting up and management of public policies with multifunctional purpose. It particularly focuses on policies that have been implemented in Germany since 1992.

Initially, a description of "traditional" policies for multifunctionality that have been initiated at EU, national, *Laender*, regional, and local level is provided. This includes, among other things, the EU Rural Development Regulations, the LEADER initiatives, the Flora-Fauna-Habitats Directive and Federal State and *Laender* legislation on protected areas. For each policy presented, apart from their "content", important characteristics with regard to their setting up and implementation, such as responsibilities for and processes of goal determination, policy and measure design, and administrative implementation are presented. Subsequently, policies are introduced that particularly aim at creating new markets and services. Furthermore, innovative approaches are presented which involve new institutional arrangements for the provision of goods and services.

Based on this presentation, the scientific debate on the design and implementation of policies with multifunctional purpose is sketched out. Five major strands of debates dealing with issues of setting up and management of those policies are highlighted: *First*, scientific literature is reflected that discusses issues regarding the allocation of property rights and the related question of applying standards, such as GFP, or incentive based policies. *Second*, light is shed on the scientific debate on the appropriate degree of centralisation and decentralisation, respectively. *Third*, directions of the discussion on policy and scheme design are considered. *Fourth*, the closely related issues of acceptance and demand of policies are highlighted. *Fifth*, questions of monitoring and enforcement are addressed.

Finally, the main research gaps are highlighted. Outstanding and promising issues include the research on optimal institutional arrangements of property rights and matching forms of governance as well as interdisciplinary work on policies other than agri-environmental schemes.

*JEL: Q18, Q28*

*Keywords: Multifunctionality, agricultural policy, rural area, agri-environmental policies, Germany, review*

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## Abbreviations

AEF	Agri-Environmental Forum
AES	Agri-Environmental Scheme
BMVEL	Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft (Federal Ministry of Consumer Protection, Food and Agriculture)
BSE	Bovine Spongine Enzeophalitis
CAP	(European) Common Agricultural Policy
CBD	Convention on Biological Diversity
DJV	Deutscher Jagdschutz-Verband
EAGGF	European Agricultural Guidance and Guarantee Fund
EU	European Union
FAL	Bundesforschungsanstalt für Landwirtschaft (Federal Agricultural Research Centre)
FFH	Flora-Fauna-Habitats Directive
FNR	Fachagentur für Nachwachsende Rohstoffe e.V. (Agency of Renewable Resources)
FSC	Forest Stewardship Council
GAK	Gemeinschaftsaufgabe zur Verbesserung der Agrarstruktur und des Küstenschutzes (Joint Task “Improvement of Agricultural Structures and Coastal Protection”)
GATT	General Agreement on Tariffs and Trade
GFP	Good Farming Practice
GRANO	R&D project on “Approaches for Sustainable Agricultural Production in Northeast Germany”
IACS	Integrated Administration and Control System
IfLS	Institut für ländliche Strukturforchung, Frankfurt am Main (Institute of Rural Development Research)
IZNE	Interdisziplinäres Zentrum für Nachhaltige Entwicklung, Universität Göttingen (Interdisciplinary Centre for Sustainable Development, University of Göttingen)
LAG	Local Action Group (Lokale Aktions Gruppe)
LAWA	Länderarbeitsgemeinschaft Wasser (Working Group of the Laender on Water Problems)
LFA	Less Favoured Areas
MEKA	Marktentlastungs- und Kulturlandschaftsausgleichsprogramm (Agri-environmental Scheme in the Land Baden-Wuerttemberg)
MoA	Ministry of Agriculture
MoE	Ministry of Environment
OECD	Organisation for Economic Co-operation and Development
PEFC	Pan-European Forest Certification
PLANAK	Planungsausschuss für Agrarstruktur und Küstenschutz (Planning Committee for Agricultural Structures and Coastal Protection)
PLENUM	Land Project for the Conservation and Development of Nature and Environment, Baden-Wuerttemberg
PRA	Participatory Rural Appraisal
RDP	Rural Development Plan
RDR	Rural Development Regulation
SRU	Rat von Sachverständigen für Umweltfragen (German Advisory Council of the Environment)
TRIPs	Trade Related Aspects of Intellectual Property Rights
TUM	Technical University Munich
UFZ	Umweltforschungszentrum Leipzig-Halle GmbH (Centre for Environmental Research)
WFD	Water Framework Directive
WTO	World Trade Organisation
WWF	World Wildlife Fund
ZALF	Leibnitz-Zentrum für Agrarlandschafts- und Landnutzungsforschung e.V., Müncheberg (Leibnitz-Centre for Agricultural Landscape and Land Use Research)

## 1 Introduction

Beyond its primary function of supplying food and fibre, agricultural and forestal activities also shape landscapes, provide environmental benefits, such as the sustainable management of renewable natural resources and the preservation of biodiversity, and contribute to the socio-economic and socio-cultural viability of rural areas. These multiple roles and functions of agriculture account for a growing recognition in both scientific debates and political decision making because of changed societal preferences, (agri-)environmental problems, and political and trade-related framework conditions. However, the concept of multifunctionality is described and interpreted in different ways depending on the perspective of the politician or scientist in question. A working definition of multifunctionality has been provided by the Organisation for Economic Co-operation and Development (OECD) (OECD 2001). The key elements of multifunctionality are a) the existence of multiple commodity and non-commodity outputs that are jointly produced by agriculture, and b) the fact that some non-commodity outputs exhibit the characteristics of externalities or public goods, with the result that for these goods markets do not exist or function poorly.

In this report<sup>1</sup>, research related to the different ways and goals of **setting up and management of public policies with multifunctional purpose** is analysed. It will be focused on policies promoting the multifunctional character of agriculture, forestry, and rural areas that have been implemented in Germany. This encompasses policies that have been initiated between 1992 and today at different levels: EU, German Federal State, *Laender*, and regional. The review centred on those policies that either have been of great importance in the German context and/or are innovative in character. Another criteria applied was, of course, the extent of the scientific debate in Germany related to aspects of setting up and management of those policies. With few exceptions, the report refers to scientific literature either written by German scientists, or carried out at German research institutes.

The report is organised as follows: In *Section 2*, it will be focused on rather “traditional” policies, such as agricultural, forestal, agri-environmental, environmental, and regional (rural) development policies. Here, it proved to be useful to distinguish between, on the one hand, voluntary, incentive-based policies, such as the EU Rural Development Regulations, the LEADER initiatives, the Contractual Nature Conservation Schemes of the *Laender*, and the EU environmental programme LIFE. On the other hand, there are basically law based command-and-control policies, such as Nitrate Directive and impact mitigation principle. Yet, it is acknowledged that those strands of policies are often interlinked, and may even form an integral part of each other (e.g., Article 16 of Reg. (EC) No. 1257/1999 is closely related to the Flora-Fauna-Habitats Directive and the Wild Birds Directive). For each policy presented, apart from their “substance” or “content”, important characteristics with regard to their setting up and implementing, such as responsibilities for and processes of goal determination, policy and measure design, and administrative implementation will be presented. Furthermore, prominent research articles covering individual policies comprehensively rather than focussing on specific aspects will be provided.

In *Section 3*, policies particularly aimed at creating new markets and services, such as programmes for the production and marketing of regional agricultural products, are introduced. Furthermore, innovative approaches are presented that aim at creating new

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<sup>1</sup> The work for this country report was conducted as part of the Project MULTAGRI on ‘Capitalisation of Results on the Multifunctionality of Agriculture and Rural Areas’, a Specific Support Action that was initiated under the 6<sup>th</sup> Framework Research Programme of the European Union (Contract No. 505297). This project aims at providing a complete overview of the research that has been done, particularly in Europe, in the different aspects related to multifunctionality of agriculture, forestry, and rural areas. Moreover, directions of future research are to be identified.

institutional arrangements for the provision of goods and services, such as decentralised and participatory processes for designing and managing agri-environmental and rural development policies and measures. In some cases, they also combine command-and-control policies with incentive-based compensatory policies.

*Section 4* focuses on the scientific debate on the design and implementation of those policies for multifunctionality presented in the previous Sections. Here, it is abstained largely from following the lines of discussions dealing with individual policies; yet, it is admitted that for some policies there is indeed a rather extensive body of literature. Instead, five major strands of debates dealing with issues of setting up and management of those policies – often overarching many different policies, or using a specific policy issue only as a starting point for a more theoretical or conceptual discussion, are highlighted: 1) What are the effects of standards, such as Good Farming Practice, on the effective property (or use) rights on natural resources? What activities (or omissions) of, e.g., farmers, should be compensated? 2) What is the optimal level of decentralisation (or centralisation) for policy design and implementation of (agri-)environmental and rural development policies? 3) What aspects are in what way relevant for an optimal policy or scheme design? What are advantages and disadvantages of result-oriented remuneration in comparison to the “traditional” action-oriented remuneration in agri-environmental schemes? What influences the economic efficiency and ecological effectiveness of policies? 4) How does research address differences in the acceptance of voluntary, incentive-based policies and of command-and-control policies? How does it account for differences in the actual demand for voluntary programmes? What role does stakeholder participation in the design process play? 5) What are the prominent research issues regarding monitoring and enforcement of these policies?

Finally, in *Section 6*, identified research gaps as well as concrete and prioritised recommendations for future research are presented.

## 2 Policies for Multifunctionality

Before describing the policies of multifunctionality implemented, some specific and relevant characteristics of the German political and administrative system as well as the policy framework Germany is embedded in will be presented. The procedures of setting up and management of policies with multifunctional purpose in Germany are influenced strongly by the federal character of the **political and administrative structures**; the distribution of competencies between the Federal State and the 16 *Laender* is determined by the constitution. Political decision making is taking place at both levels, however, administration of EU, Federal State and *Laender* laws is often restricted to the *Laender* level. At sub-*Laender* level there are also counties or *Landkreise* with their own political and administrative units (two-tiered administrative system). In some *Laender* there are also districts, so-called *Regierungsbezirke*, i.e., a federation of several *Landkreise*, representing a three-tiered administrative system. Policies promoting multifunctionality of agriculture, forestry, and rural areas are mostly under the overall responsibility of the respective Ministry of Agriculture (MoA) at Federal and *Laender* level. However, for a number of policies co-operation is needed with the respective Ministry of Environment (MoE). Pure environmental and nature protection policies are often organised within the MoE exclusively. In most *Laender*, one Ministry is in charge of both, agriculture and environment. Those ministries are often also responsible for the development of rural areas and consumer protection .

The range and the design of policies promoting the multifunctional character of agriculture, forestry, and rural areas is clearly and to a large extent the result of respective policies and regulations introduced by the **European Commission**. The precise definition of specific goals and measures, however, is largely left to the discretion of the Member States. There, necessary programs and legal provisions have to be set up and implemented according to the

national or regional needs and preferences. In this report, the Common Agricultural Policy with its first (market support) and second pillar (rural development), the LEADER initiative, the Water Framework Directive, the NATURA 2000 related directives, and the Nitrate Directive as well as the LIFE environmental program will be covered.

There is also a fair number of **international agreements** influencing strongly the EU policy framework and, thus, the range and design of German policies with multifunctional purpose. For example, the World Trade Organisation (WTO) agreement, formerly General Agreement on Tariffs and Trade (GATT), is defining rules to limit government support and protection for, e.g., agricultural production, in order to prevent distortions in world agricultural markets and to facilitate free trade. For the EU, all policies that are safeguarding or enhancing the multifunctional character of EU agriculture should be regarded as non-trade concerns (green box policies), and thus be allowed. Opponents argue, however, that state financed payments for internalising external effects of agricultural production or to promote the provision of public goods (or non-commodity outputs) by agriculture nevertheless affect trade flows and world prices because they are mostly produced jointly with commodity outputs. Other relevant examples are the “Kyoto Protocol” on limiting green house gas emissions, the “Ramsar Convention on wetlands”, the Convention on Biological Diversity (CBD), and the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs).

### ***Voluntary Incentive-Based Policies***

Agricultural policy in Germany is closely linked with and determined by the development of the **European Common Agricultural Policy (CAP)**. Introduced in 1957 mainly as a policy instrument for price protection for agricultural produce and, thus, securing sufficient food supplies, the CAP was transformed substantially in the context of the so-called McSharry reform in 1992 because of persistent production surpluses, the heavy burden imposed on the EU budget, and increasingly negative effects of agricultural production on the environment. However, the reform was aimed at restructuring agricultural markets to restore market balance, to improve the competitiveness of EU agriculture, and to account for the GATT negotiations on a liberalised trade in agricultural commodities. Hence, the CAP was organised in two pillars: the first pillar refers to “market concerns” and contains mainly direct payments for agricultural products calculated specifically for each agricultural sector. The second pillar<sup>2</sup> aims at rural development issues and includes compensatory payments for farmers in Least Favoured Areas (LFA), funds for agri-environmental schemes, and for forestry. While the design of first pillar measures is largely determined at EU level, their implementation, in Germany at least, is conceptualised and supervised by the respective Ministries of Agriculture at Federal State and *Laender* level, and implemented and administrated by the agricultural authorities at *Landkreis* level. The shape and focus of second pillar measures, however, can be determined much more freely at the Federal State and *Laender* level (see the example of the Rural Development Regulations below).

Taking into account the ongoing WTO negotiating process, the **Agenda 2000**<sup>3</sup> reform of the CAP focused on enhancing the multifunctional role of a sustainable and competitive EU agriculture (in particular, the environmental and rural function of agriculture) by shifting away (though only gradually) from generic market support (first pillar) to more targeted agri-environmental and rural development measures (second pillar). The new millennium confronted the CAP with new challenges: for example, increasing expenditures for export subsidies due to growing production, financial problems caused by the enlargement of the EU,

<sup>2</sup> To be precise, the rural development policies had not been subsumed under one single regulation before the Agenda 2000, but constituted of various so-called “accompanying measures”.

<sup>3</sup> Related literature includes Balmann et al. (1998); Eggers and Hagedorn (1998); Hagedorn and Eggers (1999); Henrichsmeyer (1998); Kirschke et al. (1998); Kleinhanss (2000); Schmitz (2002).



several food quality crises (e.g., mad cow disease “BSE”), and changed consumers’ preferences. Thus, in 2003, the CAP was modified again within the **CAP reform**<sup>4</sup> in the context of the mid-term review of the Agenda 2000. Three main elements of this reform and their implementation in Germany will be briefly highlighted: (1) decoupled direct payments, (2) obligatory modulation, and (3) cross compliance.

**Decoupling** means that direct payments for farmers are no longer coupled with the production yields of certain commodities and number of animals. So, the farmers are expected to be more flexible in their production-related decisions, e.g., opening up new sources of income, being more market-oriented, applying more extensive farming practices, and producing less surpluses. In Germany, decoupling of direct payments is implemented gradually by introducing a hybrid model (combination model) as of 2005 that will lead to a full decoupling within a so-called regional model in 2013. This transitory hybrid model includes a basic payment per hectare of agricultural land that is equal for each farmer in the same region (i.e., a *Land*, with few exceptions) but varies between the regions. Additionally, there is also an individual-farm premium that relates to premiums and quotas the agricultural firm has received in the period from 2000 to 2002.

Within the **optional modulation**, introduced with Agenda 2000, Member States can opt for a reduction of direct payments in favour of measures to support second pillar schemes. In Germany, optional modulation has been used since 2003 by cutting the direct payments by an annual 2 % (with a franchise of Euro 10,000). As of 2005, Member States have to introduce the **obligatory modulation** with payment cuts rising from 3 % per annum in 2005 to 5 % per annum from 2007 onwards (with a reduced franchise of Euro 5,000). In Germany, the *Laender* will have to decide on the allocation of the shifted financial resources within their Rural Development Plans, e.g., to extend agri-environmental schemes.

**Cross compliance** means that farmers will only receive (full) direct payments if they respect defined standards based on 19 already existing EU regulations and directives concerning environmental protection, food and fodder quality, animal health and animal welfare, and on related national regulations (Kirschke and Weber 2004). With regard to the latter, an “Ordinance on Direct Payments” (Direktzahlungen-Verpflichtungenverordnung) has been introduced by the German Federal State. This regulation will establish higher standards of **Good Farming Practice (GFP)**, such as maintenance of set-aside land, compulsory measures for preventing soil erosion, crop rotation, and planting and preservation of landscape elements (e.g., hedges, tree rows, etc.). Furthermore, a national inspection scheme to monitor the compliance is currently being developed with the *Laender* since both, the Federal State and the *Laender* will be responsible for the implementation. If a farmer fails to fulfil these standards, his/her direct payments may be reduced or cut completely, and the Member States are allowed to use the financial means they save in this way for other purposes defined by the EU (Scheele 2001).

In the context of the reform of the CAP in 1992 (McSharry Reform) the **Rural Development Regulation (EEC) No. 2078/1992 (RDR)** was instituted as part of the accompanying measures. It was part-financed by the Guarantee Section of the European Agricultural Guidance and Guarantee Fund (EAGGF), i.e., the EU would finance typically 50 % (in Objective 1 areas up to 75 %; in Germany, this applies to all of the new *Laender*<sup>5</sup>) of the costs; the Member State and/or the regions would contribute the rest. The RDR was intended to promote, among other things, environmentally friendly farming practices, extensive forms of arable and grass land farming, and the long-term set-aside of farm land but also the protection of genetic diversity, education and training for farmers in environmentally sound

<sup>4</sup> Related literature includes Grethe (2002); Klare and Doll (2004); Kleinhanss (2004); Offermann et al. (2003); Osterburg et al. (2003).

<sup>5</sup> “New” *Laender* refers to those *Laender* situated on the territory of the former German Democratic Republic.

farming practices, and demonstration projects. Apart from the environmental objectives, the regulation was explicitly intended to contribute and to stabilise the farmers' income and to reduce overproduction. Furthermore, the RDR provided for payments for afforestation and early retirement.

Farmers were to participate voluntarily in the respective schemes and had to commit to the scheme for five years. To get financial support, farmer's activities were to exceed mere compliance with the principles of GFP. Only the individual farmer's loss of income, i.e., the opportunity costs for introducing (or continuing) a certain farming practice, were to be compensated by the scheme; plus a maximum incentive component of 20 % of those opportunity costs. Following Agenda 2000, a modified **Rural Development Regulation (EC) No. 1257/1999**, was introduced with strengthened environmental objectives and new additional modes of compensatory allowances, such as for natural environmental restrictions, e.g., in LFA (Articles 13-21), and for those environmental restrictions that are based on Community environmental protection rules, e.g., the Flora-Fauna-Habitats Directive (Article 16). The latter forms a new legal construct that overcomes the divide between statutory restrictions, where farmers carry the costs of implementation, and voluntary measures, where the public carries the costs. Furthermore, aid for structural adjustment and to young farmers (Article 8), investment aids (Articles 4-7), processing and marketing aids (Articles 25-28), and measures aimed at promoting integrated rural development, such as land improvement, introduction of agricultural management services, renovation and development of villages, diversification of agricultural activities, and promotion of tourism and crafts (Article 33) are now subsumed under this regulation.

In Germany, due to the federal political and administrative structure, the *Laender* are responsible for setting up and implementing detailed **Rural Development Plans (RDP)** containing specific schemes and measures that are defined according to their regional specificity and preferences. Thus, the respective RDPs (schemes and measures) vary widely in terms of number, design, targeted environmental problem(s), and content. As the only obligatory component, each RDP has to include an agri-environmental scheme (AES). Furthermore, in some *Laender*, schemes or measures within the RDPs are co-financed and/or "topped-up" by Federal State funds (e.g., GAK) and/or by the *Laender* (e.g., Contractual Nature Protection) (see below for details). For example, Article 16 compensation payments are only provided for in some *Laender*; and only few *Laender* make use of support according to Article 33.

In general, the Ministries of Agriculture of the *Laender* have the overall responsibility for drawing up and implementing the RDPs. However, the respective environmental administrations but also other regional stakeholders, such as farmers groups, environmentalists, as well as scientific and non-scientific experts become increasingly involved in, at least, the designing process of the plans by integrating them in the consultation and evaluation process. Furthermore, some co-ordination between agricultural and environmental administrations at *Laender* and *Landkreis* level is necessary to avoid "double payments" that might occur if a farmer, e.g., applying for support for the same activities at the same plot carried out within a Contractual Nature Conservation Scheme (administered by environmental administrations) and within an AES of the RDP. Application procedures within AES are highly formalised - in most cases based on the Integrated Administration and Control System (IACS) also used for administering other area-related EU payments -, and organised by the agricultural administrations at *Landkreis* level. Monitoring, enforcement, and evaluation of the plans follows the EU guidelines and include, e.g., administrative checks, on-

the-spot-checks, annual reports delivered to the European Commission, as well as mid-term- and ex-post reviews carried out by independent research institutes.<sup>6</sup>

In 1969, the German Federal State initiated a so-called **Joint Task “Improvement of Agricultural Structures and Coastal Protection” (GAK)** promoting the continued existence of efficient and sustainable agricultural and forestal production in order to ensure Germany's competitiveness in the European common market as well as the improvement of coastal protection (BMVEL 2003). This includes, e.g., measures to improve the production and working conditions, to make production more efficient, to compensate natural environmental restrictions, and land consolidation. In 1994, a national framework plan within the GAK was set up that has been enabled the national co-financing of selected measures within the Rural Development Regulations of the EU. Constitutionally, the *Laender* are responsible for environmental and nature protection, thus, only those measures can be co-financed within the GAK that improve agricultural structures, e.g., extensive arable or grassland farming as well as organic farming, or that compensate natural environmental restrictions. For those measures, the Federal State is co-financing the remaining costs of the *Laender* (after deduction of the EU co-financing share for the *Laender*) with 60 %; rising up to 80 % if the measures also qualify for modulation funds (see above). However, the uptake of the GAK funds by the *Laender* varies widely; and some *Laender* do not make use of them at all. General goals, support frameworks, and conditions for eligibility of measures are established by the Planning Committee for Agricultural Structures and Coastal Protection (Planungsausschuss für Agrarstruktur und Küstenschutz – PLANAK) at Federal State level. Concrete measure design and implementation as well as monitoring and enforcement lies with the agricultural administrations of the *Laender*.

Apart from those AES co-financed by the EU and/or the Federal State, all *Laender* provide some form of separate **Contractual Nature Conservation Schemes** - funded by the *Land* with 100 % - that are targeted at specific biotope and species conservation but also include activities to maintain cultural landscapes (see, e.g., Bussche 2001). Legally they are based on Nature Conservation Acts of the *Laender*. These schemes are voluntary and introduced with variable but limited contract duration. Formal contracting parties are environmental authorities at *Land* level on one side and individual or groups of farmers, or so-called Landcare Groups (Landschaftspflegeverbände), on the other (Bielig 2003). In practice, however, the Lower Environment Agencies at *Landkreis* level (or the nature reserve administrations) are making the contracts and monitor and enforce them. Although there are detailed guidelines for measure design and related premiums provided for by the *Land*, there is some flexibility in tailoring the actual contract, thus, allowing for specific local and natural conditions. Agreements are mainly adopted in high priority conservation areas, i.e., existing nature reserves, where they are often provided to meet legal compensation needs (Osterburg 2000a). In some cases, contractual measures are used as “top-up” to basic extensification measures offered within the AES.

In Germany, **organic farming** has been promoted financially since 1989 by a variety of measures that range from support for the introduction or continuation of organic farming practices, investment incentives, promotion of producer co-operatives, on-farm-processing and direct marketing but also publicity measures as well as training, extension, and research. Since 1994, conversion and continuation of organic farming was financially supported as part

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<sup>6</sup> Substantive overviews of design, implementation, and evaluation of both RDRs, in particular AES, in Germany provide, e.g., Kazenwadel (1999); Nellinger (1996); Niendiecker (1998); Osterburg and Plankl (2002); Osterburg and Stratmann (2002), Plankl (1997, 1998b, c, d, 2001), Wilhelm (1995, 1999, 2001), Wilson et al. (1999) for Reg. (EEC) No. 2078/1992, and Fischer (2003); Hartmann et al. (2003); Knickel (2001); Marggraf (2003); Matzdorf et al. (2004); Primdahl et al. (2003); Reiter et al. (2003a, b); Schleyer and Laschewski (2003a, b) for Reg. (EC) No. 1257/1999.

of the AES of the *Laender* based on Reg. No. (EEC) 2078/1992. With Reg. (EC) No. 1257/1999 this promotion was continued and grants were introduced to cover partly the control costs. As mentioned above, the Federal State is co-financing these measures via the GAK, reducing the cost shares of the *Laender* to 20 % (even 10 % in the new *Laender*). However, the design of the schemes promoting organic farming varies widely between the *Laender* in terms of, e.g., premium levels, eligibility, and additional measures, such as extension. For example, in some *Laender*, conversion to organic farming is supported with higher payments during the first two years (duration of certification period before a farmer can market his or her products as “organically produced” and realise a price premium) and lower payments in the following years. Farmers participating in these schemes have also to meet the official (EU) standards for organic farming and products determined in Reg. (EEC) No. 2092/1991 and Reg. (EC) No. 1804/1999 (Nieberg and Strohm-Lömpcke 2001). In Germany, controlling and supervising the compliance with the EU Regulation(s) on organic farming on the (farm) spot is carried out by 22 approved (private) inspection bodies that have been authorised and supervised by 16 supervisory authorities of the *Laender*. Those inspection bodies may apply even higher standards and more strict inspection schemes than demanded by the EU. For this, they often provide separate labels and “Öko-Prüfzeichen”-Logos.

Following the so-called “Agrarwende”<sup>7</sup> in Germany in 2000, coming along with a now stronger emphasis on environmental aspects of agricultural production and on consumer protection in agricultural policy, German Government has pursued the objective of increasing the amount of organic farming more rapidly. In fact, it is aimed to farm 20 % of total agricultural land in Germany organically by 2011 (from 3.2 % in 2001). In 2001, the Federal Ministry of Consumer Protection, Food and Agriculture (BMVEL) drew up a **Federal Organic Farming Scheme (Bundesprogramm Ökologischer Landbau)** to foster a sustainable growth of organic farming based on a well-balanced expansion of supply and demand covering not only the production sector, but also recording and processing, trade, marketing, consumers, development and transfer of technologies, and research (BMVEL 2001). The scheme was designed by a project group under the direction of the Federal Agricultural Research Centre (FAL) together with other research institutes and with organic farming associations. The project-oriented scheme focuses, e.g., on training, educational and general information measures for farmers wishing to convert to organic farming, for food processors, the trade sector, and consumers. Here, Euro 35 million were spent in 2002 and 2003, respectively, and the scheme will be further financed with Euro 20 million annually until 2007 (Isermeyer et al. 2001; BMVEL 2004b). To implement and execute the scheme, the Federal Office for Agriculture and Food has been set up a (new) Agency for the Federal Organic Farming Scheme for this purpose.<sup>8</sup>

In 1991, the EU started the **LEADER**<sup>9</sup> initiative to support innovative projects in rural areas, thus, supplementing the “traditional” rural development policies, such as Reg. (EEC) No. 2078/1992 and Reg. (EC) No. 1257/1999. During the current third programme period – running from 2000 to 2006 – roughly Euro 250 million are provided for respective projects in Germany. EU support has to be supplemented with *Laender*, *Landkreis*, municipality or

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<sup>7</sup> For an in-depth analysis of the process of the “Agrarwende” see the publications of the research project “AGChange – Conflicts of the Agrarwende”, at Hamburg University, Germany (e.g., Feindt and Ratschow 2003; see also Alvensleben 2002).

<sup>8</sup> A substantive description of available measures in the context of organic farming is given by Brechelmacher and Willer (1995); Nieberg and Strohm-Lömpcke (2001); Lampkin et al. (2001) and Offermann and Nieberg (2001, 2002); see also Bachinger (2002); Hamm (1994); Geier et al. (1996); Haccius and Lünzer (1999); Köhne (2001); Latacz-Lohmann et al. (2001); Nieberg (1997, 2001); Nieberg and Schulze-Pals (1995); Oppermann (2002); Pick and Wilbois (2001); Spiller (2001); Weinschenck and Braun (1996).

<sup>9</sup> Related literature includes Hahn (2004); Geißendörfer et al. (1998); Raue (2001); Stöhr and Schenk (1997); Swoboda (2002).

private funds. The initiative is based on a territorial approach, that is, projects can only be adopted *within* one of Germany's 148 LEADER regions. Typically, these regions are sparsely populated and form historical, natural, economic or administrative entities. Moreover, a bottom-up procedure is applied. At the EU level, only overall programme goals have been determined, including the use of new know-how and technologies for the production of rural products and services, the improvement of rural quality of life, the promotion of local products from small production units and the sustainable use of natural and cultural resources. However, in order to implement these goals, Local Action Groups (LAG) has to be set up, which elaborate regional development plans and select and co-ordinate appropriate projects. The LAGs are characterised by the integration of local private and public representatives, in which economic and social partners must make up at least 50 %.

In 2001, the BMVEL launched the pilot programme „**Active Regions - Rural Areas Shaping the Future**“ (**Regionen Aktiv – Land gestaltet Zukunft**) to establish regional models of multifunctional agriculture, sustainable food and farming systems, and rural areas. In order to select auspicious innovative regional projects and to develop “best practice” models, a two-stage competition was initiated. In the first stage, an independent jury - representatives from agriculture, associations, regional authorities, and scientists - selected 33 regions out of 206 received applications. Those 33 regions were asked to qualify their concept and to develop a more detailed integrative regional development concept. Finally, 18 regions with the most convincing concepts are now receiving financial support in the amount of up to Euro 2-3 million each over the period from 2002 to 2005 (total programme budget is Euro 45 million). Concrete measures are designed and implemented by the regional actors and co-ordinated by regional management teams chosen by the regional actors within the model regions. By 2004, more than 400 individual measures were implemented, some even completed already. These measures, though varying widely between the model regions, are promoting, e.g., the production and use of renewable resources and regenerative forms of energy, regional marketing, and agri-tourism but also the introduction of environmentally friendly farming practices and the development of regionally adapted AES. Thus, emphasis is on a participatory, bottom-up approach towards conceptualisation and implementation, enabling and encouraging of regional actors and fostering community participation in regional rural development. The BMVEL and relevant authorities at *Landkreis* level provide an administrative support framework for the regions' activities which are also co-ordinated by a newly established Federal Office (Bundesgeschäftsstelle). First results of the accompanying research - carried out by the Institute of Rural Development Research (IfLS) Frankfurt am Main together with the Leibniz-Centre for Agricultural Landscape and Land Use Research-Müncheberg (ZALF e.V.), and TUM-TECH GmbH at Technical University Munich (TUM) - are published in Knickel and Peter (2004) (see also Brocks and Weiß 2004; Knauber 2002).

Since 1992, **LIFE** has been the most important European policy instrument to directly co-finance environmental initiatives in the Member States. It has been implemented in three phases; the most recent - LIFE III (2005-2006) - has just started. The programme is directed at supporting the development and implementation of environmental policies and legislation. Moreover, research on solutions for environmental problems of European importance shall be fostered. The programme is subdivided into LIFE-Nature, LIFE-Environment, and LIFE-Third countries, the latter being of only little importance for Germany. LIFE-Nature has been particularly enacted to support the implementation of the Natura 2000 network financially. Projects funded in this context may include the purchase of farmland in order to re-establish habitats, maintenance measures, such as continuous mowing, and information campaigns. The agriculturally most important objective of LIFE-Environment is the promotion of innovative and integrative approaches to sustainable land use planning. Projects may refer, for example, to the optimisation of catchment area management. Projects may be initiated by private persons and other legal entities. Project proposals have to be submitted to the responsible

*Laender* ministries which transmit them to the respective Federal State ministry and the EU for approval. Depending on the character of the project, EU co-financing may account for 30-100 % of total costs.

In 1979, the Federal Ministry of Agriculture and Forestry launched the “**Programme for the Establishment and Protection of Natural Areas and Landscapes of National Interest**”<sup>10</sup>. This programme includes large-scale nature conservation projects and riparian buffer schemes. In particular, these initiatives are aimed at the enduring conservation of species, habitats, and landscapes. The purchase of land within the project area is the programme’s most important measure. Subsequently, this land is leased to farmers under management restrictions. In return, farmers receive compensation payments. Federal State funds are provided for up to 75 % of the programme’s costs. Residual costs are borne by the respective *Laender* and by the organisation executing the local project. The latter, which may be composed of representatives of the *Landkreis* and municipalities as well as nature conservation associations, are responsible for elaboration and implementation of the management plans (Scherfose 1994).

Support **programmes for forestry** mainly concentrate on afforestation. In this respect, two important policies may be distinguished in the German context. On the one hand, afforestation has been guided by EU regulation – starting with the Reg. (EEC) No. 2080/1992, and later became part of the Reg. (EC) No. 1257/1999. Funding and implementation characteristics correspond to those mentioned for AES. Similarly, the practices and the amount of payments are subject to remarkable differences between the *Laender* (see, e.g., G thler et al. 2002). An additional policy is represented by the already mentioned national joint task GAK. This plan governs that the *Laender* may obtain Federal State co-funding for afforestation support, including up to 85 % of direct afforestation costs and annual premiums for the initial 20 years. Apart from EU and Federal State support programmes, certification approaches have increasingly gained importance. The two dominant systems in Germany are the Forest Stewardship Council (FSC) and the Pan-European Forest Certification (PEFC). The FSC approach aims at certifying single private and public forest owners and managers (Forstbetriebe), whereas the PEFC certifies entire forest regions (Thore 2000).

### ***Command-and-Control Policies***

**Natura 2000**<sup>11</sup> is the denomination of the intended comprehensive European system of nature reserves constituted by both the Flora-Fauna-Habitats (FFH) Directive 92/43/EEC and the Wild Birds Directive 79/409/EEC. In particular, the Wild Birds Directive is targeted at the conservation of all domestic bird species. The FFH-Directive aims at the maintenance or reestablishment of “convenient” conditions for the conservation of natural habitats and species listed in its Annexes I and II, respectively. Basic means for the completion of these goals is the designation of protected areas. In Germany, both directives are implemented by the *Laender*. Technical assistance is provided by the Federal Agency of Nature Conservation. The procedure of site selection significantly differs between both directives. Areas under the Wild Birds Directive are protected legally as soon as they are designated by the *Laender*. In contrast, the designation procedure for the FFH-Directive is divided into three steps. First, the *Laender* have to elaborate a list of proposed Sites of Community Importance and transmit it to the EU. Out of these, second, a Community list of sites is assessed on the European Level.

<sup>10</sup> Several papers provide a general description of the idea of this programme and an overview of ongoing and concluded projects within its scope (Blab et al. 1991, 1992; Scherfose et al. 1994, 1996, 1998, 2001; Bruker 2004). A detailed documentation of the setting up and management of individual projects is provided by regularly published special issues of the German journal “Natur und Landschaft”. So far, relevant issues have been 67(1992) 7/8, 69(1994) 7/8, 71(1996) 7/8, 73 (1998) 7/8, 76(2001) 9/10 and 79(2004) 9/10.

<sup>11</sup> Related literature includes, e.g., Ssymank et al. (1998) and Balzer et al. (2002).

Finally, the *Laender* have to provide for the legal protection of sites selected for that list by designating Special Areas of Conservation.

The **Water Framework Directive (WFD) 00/60/EC**, adopted in 2000, determines European guidelines for the protection of surface and ground water.<sup>12</sup> Goal is the attainment of a “good ecological, technical and quantitative condition” of all water bodies within the next 15 years. Moreover, cost-covering prices for water-related services are to be attained. In order to provide for the integrated management of rivers from the spring to the mouth, the directive particularly comprises the elaboration of river basin based management plans and programmes of measures. These requirements call for co-ordination beyond political and administrative borders of the *Laender*. Furthermore, this approach requires the integration of all sectors that account for impacts on water quality, including agriculture. The WFD requirements necessitate the adaptation of the Federal State Water Framework Act and the Water Acts of the *Laender*, e.g., regarding definitions and principles. The WFD implementation is undertaken basically by the *Laender* administration. Inter-*Laender* co-ordination is provided by the “Working Group of the *Laender* on Water Problems” (LAWA).

The **Nitrate Directive 91/676/EEC** aims at diminishing and preventing the nitrate pollution of water bodies from agricultural non-point sources. It requires EU Member States to elaborate definitions of GFP. Moreover, Member States are to identify “endangered areas” and to develop corresponding “programmes of action”. Entire Germany has been designated as “endangered area”. The implementation of the Nitrate Directive in Germany has been effected by the 1996 Fertilisation Regulation (Weingarten and Kreins 2003; see also Bach and Frede 1995; Barunke 2001; LAWA 2000).

In Germany, **Regional Planning** constitutes the general framework for national land use policies and is characterised by several technical levels of planning. The most general level is represented by the so-called land use planning which is constituted by the Federal Regional Planning Act, the *Laender* Planning Acts, and the Building Code (e.g., Spitzer 1995; see Hendrichske 2002 for interlinkages between Building Code und multifunctional agriculture). This level aims at the sustainable protection and development of spatial structures and co-ordinating different demands concerning land use. It is implemented and specified by plans at *Laender* level (regional development plan), at *Regierungsbezirk* or *Landkreis* level (regional plan), and at municipal level (land use plan and development plan), which build on each other. These plans are binding for subordinate authorities and may, for example, include the determination of areas which should be mainly devoted to nature conservation or agricultural use. Moreover, these plans have to consider the outcomes of several levels of technical planning, such as landscape planning and agricultural planning. Landscape planning, based on Federal State and *Laender* Nature Conservation Acts, is targeted at maintaining the capability of nature and landscape and identifying requirements and adequate measures concerning their conservation. In addition, it has to integrate environmental sector planning, e.g., regarding water protection or nature conservation in the narrow sense. Similar to land use planning, landscape planning is implemented by plans at *Laender*, *Landkreis*, and municipal level and commits public authorities (e.g., Selle 1996). However, aspects of landscape planning are only binding if introduced into the overall plans weighing it with other interests. The most important elements of agricultural planning are agri-structural development planning and land consolidation. The former is not legally founded and, consequently, not binding. It is mainly set up by *Laender* or regional authorities in order to prepare land consolidation by collecting and editing data. Land consolidation, regulated in the Federal Land Consolidation Act, is aimed at improving the conditions for production in agriculture and forestry as well as at

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<sup>12</sup> A general overview of legal, institutional, and technical requirements of the WFD is provided by Keitz and Schmalholz (2002) and the SRU (2004). Further insights are provided by Jedlitschka (2003) and Seidel and Rechenberg (2004).

supporting rural development. Corresponding land consolidation plans are set up mainly by *Laender* and regional authorities and implemented by the latter (Beckmann et al. 2001; Exler 2002; Tietz et al. 2003).

The **designation of protected areas** occurs in the context of legislation on nature conservation and water protection. In both cases, the legislative framework is set at Federal State level, whereas detailed restrictions and requirements are defined in *Laender* acts. Nature conservation legislation distinguishes between nature conservation reserves, national parks, biosphere reserves, landscape reserves, and nature parks. The former three categories represent nature reserves that are subject to stronger protection targeted at the conservation of species, habitats, and ecosystems. The latter two are mainly devoted to landscape conservation and recreation. The administration of reserves is typically carried out by *Landkreis* authorities or – as for national parks and biosphere reserves – by specifically established reserve authorities. They determine regulations for each reserve individually according to *Laender* and Federal State law. Restrictions that exceed requirements of GFP – which are determined by the Federal Soil Conservation Act, the Federal Fertiliser Act, the Federal Pest Management Act and, since 2002, the Federal Nature Conservation Act – require the compensation of farmers. This regulation usually applies to nature conservation reserves, national parks, and biosphere reserves (Rößling 2001; Urfei 2002).

Similar to nature reserves, water legislation requires the setting up of water protection reserves. Likewise, restrictions may be imposed on farmers, which in turn may demand compensation if GFP is exceeded. However, the assessment of requirements and payments differs significantly between the *Laender*. Some rely on central, *Laender*-determined procedures, whereas others have adopted decentralised approaches that are based on individual negotiations between farmers and water suppliers (see Section 3) (Di Fabio 1995; Weingarten and Kreins 2003).

The **impact mitigation principle**<sup>13</sup> (**Eingriffsregelung**) constitutes that activities with negative impacts on ecosystem functions and the appearance of landscape have to be avoided and – if not possible - compensated. Basically, agriculture is privileged in this context since activities that comply with GFP are excluded from mitigation needs. Nevertheless, effects of the impact mitigation principle on agriculture may be twofold. On the one hand, the *Laender* usually determine white lists of agricultural activities that fall under the principle, e.g., the conversion from pasture to farmland. Moreover, projects regulated under the impact mitigation principle, e.g., constructing public roads, *and* respective compensation measures are usually carried out on farmland. The legislative and administrative procedures in the context of the impact mitigation principle equal those mentioned for nature reserves (Rößling 2001; Rundcrantz and Skärbäck 2003).

Agriculture is usually exempted from general requirements of command-and-control policies of the Federal State as these prescribe that farming activities have to comply with **Good Farming Practice**. This applies for the legislation on soil conservation, fertiliser use, and pest management, which, in contrast to regulations on nature conservation and water protection, fall under Federal State authority. The Federal Pest Management Act, Federal Fertiliser Act and the Federal Soil Conservation Act provide rather general definitions of GFP. The latter, for example, regulates that soil cultivation with machinery has to be undertaken in accordance with site specificity, to maintain soil structure, and to avoid soil condensations. Due to EU regulations, the Federal Fertiliser Act has been specified by the 1996 Federal Fertilisation Regulation. This legislation determines precisely maximums for fertiliser use and determines how required quantities of fertiliser have to be calculated and how they have to be applied. Generally, the monitoring and enforcement of GFP is administered at *Landkreis* level (Di

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<sup>13</sup> Related literature includes Runge et al. (2003a, b).



Fabio 1995; Otto 1999; Weingarten and Kreins 2003). Several Federal State environmental acts adopt approbation procedures to provide for a sustainable practice of agriculture. The Federal Pest Management Act requires that plant protectants are to be approved by several Federal State authorities in order to minimise their entry into water bodies (Schulz 2001). Likewise, the operation of large agricultural facilities, e.g., for intensive animal husbandry or animal processing, has to be authorised by local authorities according to the Federal Immission Control Act and corresponding regulations (Di Fabio 1995).

### **3 Creating New Markets, Services, and Institutional Arrangements for the Provision of Goods and Services**

There is a wide range of policies particularly aimed at creating new markets and services, but also of innovative approaches developing new institutional arrangements for the provision of goods and services. In this Section, not all of those policies can be covered, thus, the most important ones within the German context will be presented.

Recently, the discussion on **combining the impact mitigation principle with management agreements** has emerged. The basic idea of this approach consists of the establishment of so-called compensation pools which bring supply of and demand for compensation measures and sites together. On the one hand, project developers which are legally obliged to undertake compensation efforts for their projects may “purchase” appropriate measures from the pool instead of carrying them out themselves. On the other hand, farmers may sign contracts with *Landkreis* and nature reserve authorities in order to adopt extensive farming practices on certain sites. Subsequently, these measures are registered in the pool and offered for “purchase”. In return, farmers receive compensation payments which are funded from purchase revenues. This approach allows for a better spatial co-ordination when implementing the impact mitigation principle and the realisation of large projects with high ecological impact. At the same time, support of sustainable land use is enhanced (Hünnekens 2000; Bauer et al. 2000). Some attempts have already been undertaken to implement this idea, e.g., by the NaturschutzFonds Brandenburg.

Current AES, developed under Regulations (EC) No. 1257/1999 and (EEC) No. 2078/1992, have often been criticised for being poorly adapted to local ecological, economic, and also cultural conditions since, in Germany, respective measures and premium levels are determined uniformly at *Laender* level. Thus, a lack of effectiveness and efficiency of these current schemes as well as an often little acceptance by farmers can be observed (see, e.g., Arzt et al. 2002; Deblitz 1999; Jungcurt et al. 2004). Starting from here, several attempts have been undertaken to develop **locally adapted AES** employing various forms of (local) stakeholder participation. Prominent examples are:

*First*, a local AES designed by local stakeholders, such as farmers and environmentalists but also representatives of administrations and associations at local and *Landkreis* level, participating at a round table – a so-called Agri-Environmental Forum (AEF) - in the Prenzlau-West region (*Landkreis* Uckermark, *Land* Brandenburg) within the transdisciplinary R&D project “GRANO” on “Approaches for Sustainable Agricultural Production in Northeast Germany” (1998-2002). However, while the participants were successful in designing such local scheme, it did not become part of the RDP in Brandenburg (see Arzt 2003; Arzt et al. 2002, 2003; Eggers et al. 2004; Müller et al. 2002).

*Second*, a local AES for the nature reserve “Westhavelland” in the *Land* Brandenburg that was initiated by the World Wildlife Fund (WWF) Germany and the German Hunting Association (Deutscher Jagdschutz-Verband - DJV) and designed by representatives of environmental, agricultural, hunting, and fishery associations and administrations at regional

and *Land* level. The scheme was ready for implementation in 2001, but - so far - no financial funds have been provided by the *Land* Brandenburg (Buchta 2001).

*Third*, in three model regions of the BMVEL pilot programme „Active Regions - Rural Areas Shaping the Future“ – Bitburg-Prüm/Eifel, Odermündung, and Ostfriesland – regional stakeholders have developed local AES currently waiting for ratification by the European Commission (Knickel and Peter 2004; Knickel et al. 2004; see also Brocks and Weiß 2004).

*Fourth*, a decentralised, socially accepted and economically as well as ecologically sound **result-oriented payment scheme** for environmental goods and services in agriculture, such as landscape structures (hedges or balks) and grassland rich in forb species, has been developed in the *Landkreis* Northeim in the *Land* Lower Saxony within the interdisciplinary R&D project BIOPLEX on “Biodiversity and Spatial Complexity in Agricultural Landscapes under Global Change” (2000-2006). In 2001, a Regional Board representing all relevant stakeholders in the field of agriculture and environment of Northeim – including, e.g., the environmental and agricultural administration of the *Landkreis*, the farmers’ association and the environmental groups - was established. This committee was to articulate the public demand for ecological goods and to allocate the funds through a placing procedure. This procedure included bidding components in order to create competition among the participating farms. To back up the decisions of the Regional Board, the local population’s knowledge and willingness to pay for the provision of ecological goods of agriculture were assessed through an extended contingent valuation survey. In the current project phase, the developed scheme will be implemented and the effects assessed in Northeim, and the transferability of this approach will be tested in the *Landkreis* Bad Doberan in the *Land* Mecklenburg-Western Pomerania (see, e.g., Fischer et al. 2003; Gerowitt et al. 2003). Another example for the practical implementation of result-oriented remuneration within AES is the “Marktentlastungs- und Kulturlandschaftsausgleichprogramm (MEKA)” scheme in Baden-Wuerttemberg (Matzdorf 2004b; Zeddies and Doluschitz 1996).

At the regional level, a large variety of projects has been initiated to explicitly integrate nature conservation, agricultural and further objectives and to bring representatives of these originally opposite policy fields together (**Integrated Nature Conservation Projects**). Goals may include the protection of species, habitats, and cultural landscapes through the extensification of agriculture and forestry or the promotion of regional development. Measures applied are, among others, management agreements, the purchase of acreage, certification and marketing, and education and consulting. Initiating and implementing bodies may be municipalities and *Landkreise*, regional farmer associations and nature conservation associations. Typically, these projects are designed to integrate financial support from the respective *Land*, Federal State, and European funds, e.g., AES, Contractual Nature Conservation Schemes, LIFE, and LEADER. In addition, several initiatives receive payments from private and public foundations, local municipalities, and sponsors. A good example is provided by the “Öko-Modell Hindelang” in Bavaria where a municipality, local enterprises, and farmers – initiated by a nature conservation association – founded the association “Hindelang - Natur & Kultur” targeted at the protection and development of regional nature and cultural landscapes. Participating farmers committed themselves to meet certain cultivation restrictions. Moreover, the newly founded association has been built up a regional marketing initiative. Funds were provided by EU and Bavarian support programmes for compensation and by the municipality for further project costs (Brendle 1999).

In contrast to other *Laender*, Baden-Wuerttemberg has not designated any national park or biosphere reserve in order to provide for large-scale nature conservation. Instead, it has developed its own *Land*-wide conservation strategy called **Land Project for the Conservation and Development of Nature and Environment (PLENUM)**. In the context of this programme, the *Land* Nature Conservation Agency has identified 20 large-scale

priority nature conservation areas. However, these areas are not legally protected, and *Land*-wide requirements have not been constituted. Instead, conservation goals have been defined which are to be attained within these areas. For further implementation of the programme, a voluntary bottom-up approach is applied. At the local level and under participation of all relevant land users programme goals are specified. Consequently, local population and land users may initiate adequate measures, which are accepted as long as they address at least one of the project's determined goals. So far, two pilot projects have been launched. Measures adopted include extensive farming, marketing of agricultural products, information on nature conservation, and tourism. Financial support is provided by the *Land* (Murmman-Kirsten and Höll 2000; Splett 2000).

There has been an increasing number of attempts to apply **co-operative strategies** to deal with agri-environmental problems. This includes:

*First*, there are about 400 water catchment areas with voluntary co-operative agreements between farmers and water suppliers in Germany; predominantly in the *Laender* Bavaria, Hesse, Lower Saxony, and North Rhine-Westphalia. Since currently applied command-and-control policies have not achieved sufficient prevention against water pollution caused by agriculture, water companies<sup>14</sup> negotiate with regional farmers to avoid expensive water treatments. The respective contracts differ with regard to, e.g., environmental targets, agreed measures, and compensation of farmers. In some *Laender*, governmental authorities support (and influence) actively these voluntary agreements by, e.g., co-financing contracts, co-determining the content of the contracts, and providing advisory services (see, e.g., Brouwer et al. 2002; Heinz 2003).

*Second*, following the example of Dutch environmental co-operatives (e.g., Slangen and Polman 2002) an unsuccessful attempt was made to establish an "Environmental Co-operative" of farmers in the Prenzlau-West region in the *Land* Brandenburg within the R&D project GRANO (see above). In this planned co-operative, local farmers were to organise the conservation of nature and landscape and the preservation of the physical quality of soil, water, and air in this local area collectively, thus, providing environmental goods and services in a more efficient and effective way, and with lower transaction costs compared to carrying out respective agri-environmental measures individually (Arzt et al. 2002, 2003; see also Hagedorn et al. 2002).

*Third*, the BMVEL in co-operation with the Agency of Renewable Resources - FNR<sup>15</sup> has initiated and financed a project to switch a whole village's electricity and space-heat supply from conventional to biomass energy sources and to demonstrate its practical use through the active participation of the population by using natural resources produced locally. Applying a selection process, the village Jühnde (760 inhabitants) in the *Land* Lower Saxony was chosen to implement this idea in 2004. Here, villagers have founded an "Energy Co-operative" in order to organise co-operatively the production of both the renewable resources, such as wood and energy plants, and the electric and thermal energy by processing the renewable resources (biogas plant, etc.). The Interdisciplinary Centre for Sustainable Development of the University of Göttingen (IZNE) is supporting the project with scientific expertise (Degenhardt and Karpenstein-Machan 2002).

Several *Laender*, e.g., Bavaria and North Rhine-Westphalia, have enacted support **programmes for the production and marketing of regional agricultural products and**

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<sup>14</sup> In Germany, there is a highly decentralised organisation of water supply with about 6,600 different companies (Heinz 2003).

<sup>15</sup> The Agency of Renewable Resources (Fachagentur für Nachwachsende Rohstoffe e.V.) was initiated by the Federal Ministry of Food, Agriculture and Forestry in order to support research and development in the field of renewable resources. The activities include professional consultation and financial support, as well as promoting research, scientific events, and the knowledge transfer to the public.

**services.** Additional support is provided by EU programmes, such as LEADER and INTERREG. Currently, about 500 projects and initiatives for regional marketing can be detected in Germany. Projects typically pursue economic and social goals, e.g., safe agricultural incomes and regional development, as well as environmental targets, e.g., the maintenance of cultural landscapes and biodiversity. About 50 % of these projects impose nature conservation requirements on participants and 30 % apply organic farming criteria (Blümlein et al. 2001). Furthermore, the marketing of regional products is also promoted by the EU Council Regulation (EEC) No 2081/92 of 1992 that allows for the protection of geographical indications and designations of origin for agricultural products and foodstuff.

#### **4 Implementation of Policies for Multifunctionality**

In this Section, the scientific debate on the design and implementation of those policies for multifunctionality presented above will be sketched out. While abstaining largely from the lines of discussions dealing with individual policies, five major strands of debates dealing with issues of setting up and management of those policies will be followed: 1) issues regarding the allocation of property rights and the related question of applying standards, such as GFP, or incentive based policies, 2) decentralisation versus centralisation of policies, 3) issues related to the design of policies and schemes, 4) the discussion on acceptance and demand of respective policies, in particular, AES, and the role of stakeholder participation, and, 5) aspects of monitoring and enforcement of policies. Thus, those five strands either overarch many different policies or use a specific policy issue only as a starting point for a more theoretical or conceptual discussion.

##### ***Allocation of Property Rights: Compensation or Good Farming Practice?***

From an economic perspective, policy instruments affecting the multifunctionality of agriculture, forestry, and rural areas are designed (or chosen) to either internalise negative external effects of respective production activities, such as nitrate leakage into the groundwater, or to promote those positive externalities that are demanded by society, such as aesthetic and attractive cultural landscapes. Both types of non-commodity goods are (or can be) jointly produced by, e.g., agriculture and forestry. There is a wide range of (general) design options to choose from: a) regulatory policies, e.g., laws and regulations, b) economic and incentive-based policies, e.g., taxes, grants, tradable pollution payments, and c) advisory and institutional policies, e.g., extension systems and farmers' groups. Clearly, the decision to apply one of these policy options to a specific problem is closely connected with the concrete **allocation of the bundles of property rights** (access, withdrawal, participation in management, exclusion, alienation) a targeted actor has related to specific nature components or ecological attributes, i.e., the related cost and benefit streams (Hagedorn et al. 2002).<sup>16</sup> For example, over the last decades, the number and extent of law-based restrictions on land or resource use has increased drastically, and thus, transferring basically more and more components of property (or use) rights on specific resources to the Federal State or *Land*, e.g., in the context of the implementation of the Nitrate Directive. This also results in sophisticated systems of policy-based resource-related rights and duties (Grimm 1998) increasingly more complicated to administer (Arzt et al. 2002), e.g., due to often *imprecise legal provisions*. Referring to the latter, Röbbling (2001) shows that *Laender* legislation on nature reserves often accounts for deficient definitions of usage restrictions. Similarly, Jessel (1998) and Dierßen

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<sup>16</sup> For example, a farmer may have the "right" to use a certain amount of pesticides (per hectare and year) on his/her land, but is not allowed to exceed this limit by law. Usually, he/she is not compensated for being denied to go beyond this limit. However, if he/she agrees to use no pesticides at all on his/her land, he/she might be compensated for the income foregone, e.g., by participating in an AES.

and Reck (1998) criticise that lacking legal specifications on the impact mitigation principle results in its heterogeneous application.

Starting from here, the fundamental question arises which activities (or omissions) an actor should be paid for and which he should be obliged, e.g., by law, to provide (or to omit) without compensation (e.g., Hötzel 1995; Kantelhardt and Hoffmann 2001). In Germany, a prominent approach to address the underlying question of property rights allocation has been the definition of standards of **Good Farming Practice (GFP)** (Nitsch and Osterburg 2004a) within several Federal State and *Laender* acts.<sup>17</sup> However, neither the Federal Fertiliser Act and Regulation (Smeddinck 2003) nor the Federal Pest Management Act (Weins 2001; Bossow 2002; Hogenmüller 2002) or the Federal Soil Conservation Act (Müller 2002) provide adequate implementation guidelines, i.e., clear and sound indicators and (inexpensive) procedures to control compliance are missing (Arzt et al. 2002). With respect to the assessment of Good Farming Practice within the Federal Soil Conservation Act, Smeddinck and Hogenmüller (2000) – applying political economics and jurisprudence – conclude that this legislation is an example of symbolic legislation accounting for no actual control since it mainly relies on general prescriptions. Similar criticism is raised concerning Federal State and *Laender* Nature Conservation Acts (Rößling 2001; Schrader 2003), and the Federal Forest Act (Winkel and Volz 2003). Consequently, several authors attempt to translate the idea of GFP in agriculture into concrete provisions (see, e.g., Heissenhuber 1995; Hofmann et al. 1995; Schumacher 2000). The protection of abiotic resources, such as soil and water, is perceived predominantly as a basic component of GFP, whereas the conservation of biotic and aesthetic natural resources is often regarded as exceeding this standard and, thus, would require compensation (Weins 2001). Analogous attempts have been undertaken for forestry (Hampicke 1996; Winkel and Volz 2003; Thoroe et al. 2003).

Furthermore, scientific literature also highlights that providing a higher standard than determined in the GFP does not automatically call for compensation. (Agricultural) practices exceeding GFP only call for compensation if they actually involve income losses that stem directly from restrictions (Di Fabio 1995; Otto 1999) and if the services provided are subject to scarcity and not produced as by-products anyway (Heissenhuber 1995; Hofmann et al. 1995). On the other hand, Heissenhuber (1995) emphasises that, in some cases, compensation should be granted although specific (farming) practices/activities may be required as GFP, e.g., if land users are likely to give up farming on marginal land whose (continued) cultivation, however, appears to be valuable from the point of view of nature conservation and even for tourism (see also Jungcurt et al. 2004; Schleyer and Laschewski 2003b). Furthermore, compensation might also help to ensure that the legal requirements are actually met by the farmers, in particular, if monitoring compliance (ex-post) is not possible or very costly.

In this context, Laschewski et al. (2004) look at the case of **Article 16 of the EU Rural Development Regulation (EC) No. 1257/1999**. Here, the linkage of compensation to limitations on agricultural land use based on Community environmental protection rules is legally an interesting construct that overcomes the divide between statutory restrictions, where farmers carry the costs of implementation, and voluntary measures, where the public carries the costs; instead, they appear to be complementary in nature. Officially, this policy arrangement is intended to give economic incentives to farmers not to cease farming in protected areas and to ensure the farmers' compliance with the limitations in land use. In the *Land* Brandenburg, the authors found the provision of Article 16 to be crucial to speed up the

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<sup>17</sup> However, several authors criticise the basic idea of exempting agricultural practices from general requirements of environmental legislation and limiting usage restrictions to a determination of GFP only, although agriculture accounts for important impacts on nature (see, e.g., Smeddinck and Hogenmüller (2000) and Stollmann (1996) for a discussion on Federal and *Laender* Soil Conservation Acts).

participatory installation process to designate protected areas and to allow for the fixation of (more) restrictive limitations; in some cases, Article 16 was even a precondition to get started with the installation process in the first place (Laschewski et al. 2004; see also Schleyer and Laschewski 2003a).

The introduction of **cross compliance in the CAP policy framework** is supposed to strengthen the role of environmental and social objectives by demanding from the Member States the formulation and implementation of clear and legally binding GFP and other standards, and by making compliance with these standards a condition to receive full direct payments (see, e.g., Nitsch and Osterburg 2004b for a critical discussion). Effectively, this implies further restrictions of farmers' or land owners' de facto property (or use) rights on respective plots. For Hagedorn et al. (2001), however, this "upgrading" of a policy originally designed to reach distributional objectives with new environmental (and societal) objectives serves predominantly the purpose to provide a new basis of legitimisation of direct payments by the public (see also Berg 2001) while ignoring the differences in institutional arrangements needed to reach a respective goal. They argue, that formation, implementation, monitoring, and control of direct income transfers, on the one hand, are easily shaped and organised in a centralist and hierarchical way. The decision making on environmental standards, e.g., the acquisition of the required knowledge on local nature and actors attitudes, and even more the implementation and regional adjustment of standards by means of rather complex mechanisms of administration, monitoring and control would, on the other hand, require decentralised approaches (Hagedorn et al. 2002).

### *Decentralisation Versus Centralisation*

In the literature reviewed, there is a lively debate on issues of decentralisation and centralisation of policies covered in this report (see, e.g., Döring 1997). Here, a prominent part of the literature is reflecting on EU agri-environmental policies where many authors observe critically the high degree of centralisation and postulate a need for decentralisation (see, e.g. Kirschke et al. 1998; SRU 1994). In order to determine an optimal degree of decentralisation or centralisation, Urfei (1999) suggests employing the **Economic Theory of Fiscal Federalism** that seeks for the best allocation of instruments to the various levels of a federal system. This normative and very prominent approach focuses on the spatial characteristics of the economic and political activities in question (Ewers and Hassel 2000). In addition, other criteria which determine the optimal incentive structure for the decision makers are taken into account, e.g., the principle of fiscal equivalence. With respect to agri-environmental policy, criteria to be applied would include a) the spatial impact of environmental effects caused by agricultural activities determining simultaneously the spatial distribution of those individuals and groups affected in a positive or negative way, b) differences in people's regional willingness to pay for the internalisation of those externalities, c) spatial differences regarding the abatement costs for avoiding environmental damage, or the costs of providing an environmental improvement, d) economies of scale and scope inherent in the activities of resource protection and environmental improvement, and e) regional differences regarding the dynamics of innovations (Rudloff and Urfei 2000; see also Henrichsmeyer et al. 1997; Johst et al. 2002; Wätzold and Drechsler 2005). Thus, an optimal allocation of competencies has been achieved if the aggregated costs, i.e., costs of centralisation plus costs of decentralisation, are minimised. The resulting allocation level, however, might not be the same for all partial competencies concerned, such as goal determination, financing, monitoring, and sanctioning (Rudloff and Urfei 2000). Within the German research project "Agri-Environmental Policy under the Subsidiarity Principle" - supported by the Robert Bosch Foundation - this approach was applied to analyse empirically the most important agricultural activities, reviewing them for their external effects on natural

resources, such as soil, water, climate, biotic and aesthetic resources, and animal welfare. The respective externalities were categorised according to their spatial impact: local, regional, and supra-regional (Robert Bosch Stiftung 2000; Ewers and Hassel 2000; Ewringmann and Bergmann 2000; Rudloff and Urfei 2000; Hampicke et al. 2000; Zeddies et al. 2000). With respect to AES in Germany and the related distribution of partial competencies, Rudloff (2002) and Urfei (1999) come to the conclusion that they constitute a positive example of an appropriate arrangement concerning goal-determination, decision and enforcement competencies, but show deficits regarding the financing competencies. With regard to the latter aspect, both authors point at the relatively high co-financing share of the EU (50-75 % of the scheme costs) compared to its rather low influence on the goal determination of the schemes; thus, being a contradiction to the principle of fiscal equivalence. However, Hagedorn (2000) and Hagedorn et al. (2002) criticise the fiscal federalism approach for being limited to the spatial features of the problems in question, and thus, ignoring other important properties of the underlying transactions, such as frequency and complexity. Furthermore, if one considers also the need to design and implement appropriate problem-solving policies, the actors' particularities, such as values, attitudes, and interests have to be taken into account.

In the scientific debate on determining optimal levels for policy design and implementation, other authors, not (explicitly) applying the fiscal federalism approach, bring forward similar but also additional arguments and aspects:

*First*, for solving agri-environmental problems marked by super-regional, international, or even global cause-effect relationships, e.g., the **effects** of emissions - stemming from agriculture - on the climate, decentral policy approaches may be less effective (Zimmermann und Kahlenborn 1994) or even have no effect at all if not, at least, co-ordinated at a relatively high political and administrative level (Scheele 1993; Urfei 1999; Thoroe 2001). Here, the resulting costs can not be internalised easily since, e.g., free-riders can not be avoided when providing global public goods (Karl 1995; Urfei 1999). Thus, with regard to AES, Bergschmidt and Plankl (1999) suggest to define differentiated, regionally-adapted goals and measures if the respective problems are regionally limited. In contrast, the formulation of undifferentiated or "horizontal" measures would be justified to realise national or global aims, e.g., climate protection. Deblitz et al. (1998) categorise the degree of decentralisation of AES in several EU Member States. Following this categorisation, Germany shows an average degree of decentralisation, which means that regional and nation-wide schemes have the same importance. For making policies and measures more effective, a general need for spatial differentiation is also postulated for other relevant policies: Nottmeyer-Linden et al. (2000) conclude that measures in contractual nature conservation schemes should be more regionally targeted in order to allow for the consideration of site specificity and, consequently, ecologically effective adoptions. Similarly, the determination of GFP should rather be regionalised than uniformly defined within Federal State laws (Köbler 1997; Winkel and Volz 2003). Lacking differentiation proves to be particularly ineffective in the context of afforestation support. The strategy of granting payments uniformly within the *Laender* has often led to increasing afforestation in already densely wooded areas where it collides with nature conservation interests, e.g., aiming at open landscapes (Güthler et al. 2002; Klein 1997, 2003; Gottlob 2004). Consequently, such areas should be exempted from support (Jedicke 1993; Finck and Schröder 1997). Moreover, a better integration of afforestation and planning means appears to be useful (Herbert 2003). In addition, Blümlein et al. (2001) emphasise that criteria for the marketing of regional products have to consider regional specificity since nature conservation requirements differ between plains and mountain areas.

*Second*, apart from issues of effectiveness, literature sheds light on the **costs different degrees of decentralisation involve**. Laaser and Stehn (1996) demonstrate that centralisation of public tasks results in dead-weight losses. They recommend decentral responsibilities for the state-run allocation of public goods as a rule, but, at the same time, highlight advantages

of and reasons for centralisation under certain conditions, e.g., nation-wide external effects, economies of scale, and economies of scope for central production of public goods. In contrast, Ahrens et al. (2000) emphasise the undeniable high transaction costs of decentralisation of AES, e.g., for planning, implementation, and control. Regarding the WFD, Moss (2003a, b; 2004) and Petry and Dombrowsky (2005) apply institutional economics and find that inter-*Laender* co-ordination may solve problems of spatial fit of river basin management at the expense of institutional interplay, that is, higher co-ordination efforts between administrative levels. Moreover, command-and-control policies often apply administrative procedures that require local authorities - being responsible for implementation - to consult superordinated *Laender* or Federal State based advisory agencies in order to obtain technical support and, therefore, involve significant transaction costs. This is true, for example, for the implementation of *Laender* Soil Conservation Acts (Stollmann 1996) or the impact mitigation principle (Tegethoff 2002). Yet, there might also be economies of scale with regard to the establishment of administrative units at higher levels, if, e.g., technical support from expensive laboratories for analysing soil or water samples are concerned.

*Third*, several authors discuss critically the **relocation of competencies** from the Federal State to *Laender* or *Landkreis* level regarding nature conservation and water issues. Leist (1998) and Kehrein (2002) argue that this arrangement impedes a comprehensive implementation of the Natura 2000 network. Additionally, several authors document that management of the impact mitigation principle by *Landkreis* authorities has resulted in deficient and heterogeneous nature conservation (Henkel 1994; Hoppenstedt and Runge 1998; Rößling 2001). This problem may be devoted to lacking knowledge and information at local level (Schweppe-Kraft 1994; Rundcrantz and Skärbäck 2003). As one means to overcome these deficiencies, jurisprudential and planning literature discusses the idea of compensation pools that co-ordinate the spatial allocation of compensation sites between regions (see, e.g., Müller-Pfannenstiel et al. 1998; Breuer 2001; Bruns et al. 2001; Böhme and Bunzel 2002; Jessel and Szaramowicz 2003)<sup>18</sup>. Similar to the impact mitigation principle, the definition and designation of nature reserves accounts for severe heterogeneity (Bibelriether et al. 1997; Wüst and Scherfrose 1998; Panek 1999). Particularly, nature reserves of super-regional importance should rather be administered at *Laender* level, e.g., nature parks (Bugiel 2000; Ostermann 2000), or even at Federal State level, e.g., national parks (Urfei 2002). Moreover, Ramsauer (1993) observes that *Laender*-, *Landkreis*-, and municipality-based landscape planning is executed heterogeneously and, therefore, does not allow for setting up a comprehensive nation-wide nature conservation framework. Nevertheless, Jordan (1996) emphasises that the participation of local authorities is necessary since landscape planning has to be implemented by them. The appropriateness of the allocation of legislative competencies to the *Laender* appears to be particularly questionable in the context of the implementation of the WFD. Institutional misfits between WFD requirements and existing arrangements in Germany, particularly between prospected river basin management and existing *Laender* administrations, may result in lacks of implementation (Moss 2003a, b, 2004; SRU 2004). To overcome these deficits, several jurisprudential authors emphasise that national guidelines and co-ordinating organisations are needed (Ell 2003; Fichter 2003; Hecht and Walter 2004; Köck and Unnerstall 2005; Seidel and Rechenberg 2004). Moreover, Röhring (2003) points out that the implementation solutions have to allow for institutional interactions between actors of water protection and those of agriculture.

*Fourth*, several authors discuss the **role of regional administrations** and possible imbalances in regional power structures in the context of decentralisation. To increase the economic and ecological efficiency of AES, the EU is delegating the design of schemes and measures to the

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<sup>18</sup> The approach of compensation pools still involves legal problems since it does not necessarily account for a functional and spatial connection between impacts and compensation measures which is required by the Federal State and *Laender* Nature Conservation Acts (see, e.g., Müller-Pfannenstiel et al. 1998).



Member States. Here, Ahrens et al. (2000) identify a typical principal-agent situation, since the agent (Member State) follows own interests and might be influenced by agricultural lobbies pressing to support the farmers' income. Eventually, the principal (EU), perhaps more motivated by environmental aims, is paying for the income motivation of the agent (Member State) as a result of information asymmetry. For Rosenfeld (2003), discussing the superiority of decentralisation with respect to regional policy in Germany, the higher diagnostic capacity, i.e., the ability to detect regional problems and to develop appropriate solutions, of decentral units of government has not been proven so far. Actors on the regional level, he argues, instead might be prone to choose measures according to their own interests that are either inefficient or even in contradiction with the policy goals determined at higher levels. Thus, in the case of Germany, a further decentralisation of decision making would only show positive effects under certain conditions, e.g., improved accountability of regional decision makers.

Examining an attempt to implement a locally designed (sub-*Laender* level) AES in the Prenzlau-West region in Brandenburg within the R&D project GRANO (see Section 3), Eggers et al. (2004) argue that the process of designing AES in Germany can be conceptualised as a rather complex negotiation process at the *Laender* level. The institutional settings in which this negotiation process takes place shape the possible outcomes and, thus, the design of the schemes. With only "passive support" for decentralised and participatory approaches, yet compulsory complex bureaucratic procedures on part of the EU, there are no incentives for the administration at *Laender* level to actively support those approaches. Starting from the same case study, but focusing on obstacles to an institutional change towards decentral approaches in European agri-environmental policy, Eggers (2005) confirms empirically that political and administrative actors at all levels show an only very limited interest in fostering decentral and participatory approaches. He also points to the higher risk of financial correction (*Anlastungsrisiko*) on part of regional administrations when implementing those approaches.

### ***Policy and Scheme Design***

Effectiveness and efficiency<sup>19</sup> of policies for promoting multifunctionality of agriculture, forestry, and rural areas are among the most prominent issues discussed in the literature reviewed. They are almost exclusively raised in the context of AES and organic farming. For evaluating AES that pursue usually three main goals - farm income support, environmental improvements, and reduced market surplus<sup>20</sup> -, Ahrens et al. (2000) distinguish between a) income efficiency, b) ecological effectiveness, and c) effectiveness of reducing market surplus. Looking at the results of an analysis of the agri-environmental scheme MEKA in the *Land* Baden-Wuerttemberg carried out by Zeddies and Doluschitz (1996), Ahrens et al. (2000) found for this scheme, on the one hand, high income efficiency, and, on the other hand, only marginal ecological effectiveness. Following Ahrens et al. (2000), this would be due to the fact that in particular those farmers participate in the scheme whose ex-ante modes of operation, i.e., their farming practices before participating in the scheme, are quite similar to the practices defined in the MEKA scheme. This would also explain the scheme's relatively low or almost absent reduction of market surplus, a 2 % production decrease due to the introduction of MEKA found by Zeddies and Doluschitz (1996). Jungehülsing (2000) criticises this line of argumentation: *First*, with regard to the low reduction of market surplus,

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<sup>19</sup> Effectiveness refers to the accuracy and completeness with which specified goals can be achieved. Efficiency is determined by relating the resources expended to the accuracy and completeness of goals achieved.

<sup>20</sup> These three goals were mentioned in the (old) Reg. (EEC) No. 2078/1992. The (new) Reg. (EC) No. 1257/1999, however, does not state (at least not explicitly) the goals of farm income support and reduction of market surplus anymore, instead stressing more the environmental goal. Yet, the larger part of the literature reviewed (still) deals with design and results of the "old" regulation.

he points to the fact that the findings are based on only one empirical study, and thus, cannot be generalised. *Second*, the actual regional (*Laender*-oriented) differentiation of the existing AES in Germany would be sufficient to argue for their high ecological effectiveness. Finally, he comes to the conclusion that both ecological effectiveness as well as reduction of market surplus are satisfyingly high. In general, Baudoux (2001) follows this argumentation and emphasises that, in contrast to direct payments within the GAP, AES result in a significant advancement of targeted environmental indicators, and thus, show a (comparatively) high ecological effectiveness.

Indeed, Schramek (2001) and Osterburg (2000b) find significant effects of AES in Germany in terms of farming intensity. Osterburg (2000b), employing cluster analysis, finds that, in most cases, farmers participating in the schemes a) increased their grassland, b) have a lower farming intensity, c) reduced beef production, and d) decreased the expenses for mineral fertiliser compared with non-participating farmers. Schramek (2001), analysing 22 case studies including two cases in Germany, explicates a decrease of mineral nitrogen fertiliser and pesticides and a lowering of stocking. Still, concerning land use changes, such as conservation and expansion of permanent crops, planting of hedges, and change of the diversity of arable crops, there were no significant effects. In explaining the different effects, he refers to inexpensive adjustment paths for some measures, such as (reduced) application of mineral fertiliser and pesticides, and to the necessary costly and long-term adjustment paths for other measures, such as change of crop rotation. Furthermore, Osterburg (2000b) considers the ecological effects of the measure “introduction of organic farming” and postulates that organic farms show more pronounced extensification effects (e.g., pesticides and feed concentrates, high reduction of livestock intensity) than non-organic farms.

There are several authors pointing to the tendency of AES in Germany to overcompensate farmers (apart from the permitted 20 % incentive surplus) (e.g., Ahrens et al. 2000). Yet, the general assumption of overcompensation is questioned by authors that draw a more differentiated picture. In marginal regions, for instance, those measures that aim at an extensification of production have an additional positive effect as they give farmers an incentive to keep the land under production, and thus, to maintain an open landscape. In areas with high quality soils, however, the extensification payments usually do not fully compensate the economic loss due to comparatively high opportunity costs (Deblitz 1999; Osterburg 2002). This means that very often the income losses that are actually experienced when measures are applied depend on the soil quality and on other local conditions that can be quite different even within a single *Land*. In this discussion, Osterburg (1999) argues for tolerating income effects of these schemes if the administrative (transaction) costs for premium differentiation, resulting perhaps in reduced premiums in some cases, are higher than the reduction (see also Wätzold and Schwerdtner 2005). Furthermore, since agriculture is producing positive environmental effects that are not (completely) internalised by markets positive income effects are legitimate (Osterburg 1999). He also points to substantial methodological problems to sufficiently determine income effects of these schemes at all. Here, e.g., the often used proxy-indicator “scheme participation” would lead to false results since this indicator includes also farmers who do not (have/had to) change their farming practice when entering the scheme (Osterburg 1999).

In this context, some agricultural economists stress that application of result-oriented rather than action-oriented remuneration would increase effectiveness and efficiency of AES. Furthermore, **result-oriented remuneration** would increase innovation potential, reduce information asymmetries, and promote self-interest, co-operation, continuity, and farmers’ intrinsic motivation and interests for environmental problems (Gerowitt et al. 2003; Hampicke 2001; Matzdorf 2004a; Wätzold and Schwerdtner 2005). For Matzdorf (2004a), result-oriented remuneration leads also to a distribution of risk between farmers and society. Bertke et al. (2003) stress, in particular, the higher ecological effectiveness of result-oriented

remuneration. The most comprehensive comparison of result-oriented and action-oriented remuneration can be found in Matzdorf (2004b). Henseleit et al. (2003) discuss the option for implementation of result-oriented remuneration within the agri-environmental policy of North Rhine-Westphalia.

Obviously, the high complexity, heterogeneity, and variability of ecological systems make it difficult to apply result-oriented remuneration. Changed farming activities, e.g., switching to extensive forms of farming, would result in rather stochastic, uncertain, and very much delayed (environmental) effects, e.g., the recurrence of certain rare plants or birds on a specific plot. Thus, a farmers' "investment" would be confronted by a highly uncertain premium level or even no premium at all (Hampicke 2001, see also Hagedorn 2001). Also, ethical concerns are raised (getting paid for "producing" species) (Hampicke 2003) as well as legitimacy issues related to environmental transactions (Hagedorn 2001). In the context of result-oriented remuneration, two main aspects are discussed in more detail:

*First*, since farmers' activities are not the basis for remuneration, the opportunity cost approach can not be used to determine the premiums. Instead, the results, e.g., the recurrence or increase in number of a specific rare bird or a concrete cultural landscape have to be valued (Holm-Müller 2003). Here, several direct valuation methods have been suggested, such as contingent valuation method (being discussed most prominently), attribute based choice modelling, and participatory approaches, but also indirect valuation methods, such as travel cost method, contingent behaviour method, hedonic price method, and averting behaviour method (Ahlheim and Frör 2003). The "embedding-effect", i.e., the measure or activity is carried out at local level but benefit streams are not restricted to this level (see e.g., Mann 2003) and the lack of information on the environmental goods to be valued are the relevant problems in this context (Holm-Müller 2003). Furthermore, Mann (2003) suggests the expert valuation method to be applied as an alternative to the contingent valuation method in the case of AES.

*Second*, direct measurement and observation of environmental results is often difficult and costly, if not impossible (Hampicke 2001; Gerowitt et al. 2003). Thus, indicators need to be found to determine whether a premium has to be paid or not (Matzdorf 2004a; Piorr and Werner 1998). Hampicke (2001) refers to a huge discordance of existing indicators and suggests choosing easily observable indicators in order to minimise monitoring costs and to ensure transparency. Based on Matzdorf (2004a), there are three main problems concerning the development of indicators: (a) the complexity of cause-and-effect relations, (b) the diversity of environmental objectives, e.g., protecting certain rare species and preserving a specific cultural landscape in the same area, and (3) the normative nature of the process in which indicators are devised.

With regard to **premium levels** of extensification measures within Reg. (EEC) No. 2078/1992, Plankl (1998b) observes significant differences between the *Laender*. These differences, he argues, can be explained by differences in a) opportunity costs for scheme participation in the respective regions, b) costing methods used by the responsible *Laender* ministries, c) experiences with comparable forerunner schemes, c) path-dependencies, d) natural conditions, such as soil quality and typical cultural landscapes, and e) (political) preferences on part of the *Laender* (ministries). Plankl (1998b) also points out that differences in premium levels for basically similar measures would result in a distortion of competition between farmers in different *Laender*.

Another body of literature discusses more competitive forms of determining premium levels in AES. It is suggested to apply *tender procedures for fixing premium levels* and to select scheme participants. Premiums determined by tender procedures would provide higher incentives for farmers to participate in those schemes and would limit overcompensation since actual opportunity costs (plus individual profit margin) are revealed (Holm-Müller et al. 2002;

Plankl 1998a; Latacz-Lohmann and van der Hamsvoort 1998). Plankl (1998a) shows that tender procedures are most easily applicable for extensification schemes whereas they seem to be rather counterproductive for choosing among different areas in environmental contracting since those regions with high opportunity costs, e.g., due to high soil fertility, would be disadvantaged systematically. As an alternative to traditional tender procedures, Plankl (1998a) discusses the “bookbuilding” tender procedure that involves a stepwise negotiation process between the contracting partners. In contrast to the lively discussion in the literature, examples of practical implementation are rare: Based on experiences made within a model project in North Rhine-Westphalia applying tender procedures to AES, Holm-Müller and Hilden (2004) observe low or no transaction costs for implementing those schemes as well as strategic behaviour of only few participating farmers during the bidding process. In an unsuccessful attempt to implement tender procedures in the AES of the *Land* Brandenburg within the R&D project GRANO on “Approaches for Sustainable Agricultural Production in Northeast Germany”<sup>21</sup>, Arzt et al. (2002, 2003) find substantial concern against the implementation of tender procedures on part of both farmers and administrative authorities at *Land* level.

Looking at AES co-financed within the EU Rural Development Regulations, some authors observe critically the **obligatory 5-years-timeframe of contracts**. This inflexible rule would impose risks on both contracting partners: a) political and administrative authorities at *Land* level would not have the option to end the contract prematurely free of charge, e.g., responding to budgetary problems and, b) farmers, in turn, lose the option to react flexibly to changing market prices (Stern 2003). Furthermore, the renewal of those contracts after five years cannot be guaranteed. In cases that require investments this may negatively affect the willingness of farmers to commit themselves to such contracts and, consequently, the introduction of long-term contracts has been suggested (Hampicke 2001; Schramek 2001). Such long-term contracts may also avoid the problem that – in case a conservation benefit has been created which cannot be easily reproduced elsewhere – the farmer is in the position to bargain for very high payments by threatening not to renew the contract (Wätzold and Schwerdtner 2005). These arguments in favour of long-term contracts have had little or no effect on the design of current AES, thus, long-term site protection that is preferred by environmentalists is hampered. For the same reason, short contracting periods are also criticised with respect to the impact mitigation principle and contractual nature conservation schemes (Bauer et al. 2000; Nottmeyer-Linden et al. 2000).

A remarkable amount of studies discusses whether European directives are adequately implemented in the German context (an overview of the literature on the **implementation of environmental policies** in Germany is given in Bültmann and Wätzold (2002)). Major attention is devoted to the implementation process of the FFH-Directive and the Wild Birds Directive. In this context, considerations are mainly undertaken from the point of view of nature conservation and jurisprudence. Concerning nature conservation, an extensive literature is available which develops guidelines for the technical and administrative implementation of the Natura 2000 network (see, e.g., Ssymank 1994; Ssymank et al. 1998; Petersen et al. 1998; Ellwanger et al. 2000, 2002; Balzer et al. 2002; Ssymank et al. 2003). However, the actually applied process of implementation is subject to severe criticism. Kehrein (2002) documents that the implementation of the Natura 2000 network in Germany is very much delayed. Additionally, several authors criticise that the current status of registration of areas pursuant to the FFH-Directive and the Wild Birds Directive is far below the potential amounts identified by environmental associations (Ringler 1998; Schreiber and Spilling 1999; Spilling 1999; Schreiber 1999; Niederstadt and Eberhardt 2000). Moreover, the legal constitution of the directives within the Federal Nature Conservation Act is found to be

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<sup>21</sup> Compare also Section 3 and Müller et al. (2002).

deficient, e.g., concerning project definition and conservation goals (Freiburg 1998; Niederstadt 1998, Rödiger-Vorwerk 1998; Fisahn 2001; Gellermann 2001). Discrepancies may be contributed to diverging perceptions of administrative discretion and economic and political considerations of the *Laender* (Schreiber and Spilling 1999; Spilling 1999; Niederstadt and Eberhardt 2000). Moreover, Niederstadt (1998) and Danielzik (2001) note that nature conservation administrations often lack adequate knowledge of the distribution and ecology of species and appropriate financial resources. Similarly, the implementation of the WFD and the Nitrate Directive is criticised. With respect to the WFD, Köck and Unnerstall (2005) find that legal implementation efforts undertaken by the *Laender* up to now are delayed. Moreover, the *Laender* have mainly concentrated on setting up management plans but neglected the elaboration of more important programmes of measures. Flaig et al. (2002) highlight that the Federal Fertilisation Regulation, enacted to implement the European Nitrate Directive, accounts for several deficits in particular with respect to controlling non-point pollution from agriculture, such as too low restrictions to fertiliser application and only unspecific nitrate balances.

### *Acceptance, Demand, and the Role of Participation*

In the scientific literature on setting up and management of policies with multifunctional purpose, the issues of acceptance and demand are closely related; yet, the two terms are not uniformly defined. Osterburg et al. (1997) distinguish between *acceptance* as the attitude towards policies, and *demand* as the actual enrolment of actors and target groups. In this sense, demand does only play a role with respect to incentive-based policies, such as AES. Here, acceptance of a scheme or measure can be higher than one could expect by only looking at numbers of participating farmers. This might be due to prohibitively high opportunity costs and a missing eligibility to take part in this scheme (e.g., because farm size is too small and farm is not located in targeted area), but also due to the fact that specific measures of this scheme are not “open” for participation because of budgetary problems at the *Land* level. In contrast, the concept of acceptance is relevant for both types of policy, incentive-based and command-and-control policies.

Lettmann (1995) developed a conceptual framework to reveal the **acceptance** of extensification measures that distinguishes three sections: First, there are factors of the “objective environment” including the physical and social environment, natural conditions of the area, operating system, farm organisation and farm structure as well as attributes of the farm manager. Second, there are “interceding variables” such as willingness and disinterest of farmers, knowledge, and environmental awareness. Finally, there are “sociological variables”, such as “purchase-character” and “information behaviour” which reflect the communication-relation, and the actions and decisions of the farm manager. Furthermore, for the analysis of acceptance, Moser (1997) distinguishes between the level of expression of opinion and the level of the real activity.

Moreover, acceptance depends on how exactly policy goals and administrative procedures have been determined. First of all, acceptance crucially depends on the amount and flexibility of policy requirements and compensation payments. This is not only true for AES (Zeddies 1998; Baudoux et al. 1997; Osterburg 2001) and contractual nature conservation schemes (Schmidt-Moser 2000; Weis et al. 2000), but also for integrated nature conservation projects at the regional level (Brendle 1999). In addition, the acceptance of agri-environmental policies may depend on operational concerns, different structure of farmer’s personality, the timeframe of programmes (Autsch 1992) and experiences gained from forerunner schemes (Schulze-Pals 1994; Mehl and Plankl 1995, 2001, 2002). Osterburg (2001) presents a variety of further non-economic influences, such as environmental attitude, availability of information, technical assistance, contract period, and scheme requirements that may affect

the acceptance of extensification schemes. Uppenbrinck and Gelbrich (1996) and Gruehn and Schiller (2002) demonstrate that regional and landscape planning provisions may not be adequately considered as they often lack precise goal and measure prescriptions. Considering the example of a proposed national park, Harthun (1998) analyses how unclear competencies and conservation strategies raised prejudices among local population and finally prevented the designation. A positive example is given by Thoroe (2000) who highlights that the FSC forest certification approach accounts for higher acceptance than the competing PEFC system since the former provides for a clear allocation of responsibilities, and thus, forest owners know exactly which obligations to meet in order to obtain the certificate. Furthermore, several empirical studies point out the impact of a policy's communicative structures (Blum et al. 2000; Kullmann 2003). In this context, the engagement of respected local representatives appears to be particularly useful (Brendle 1999; Luick 2002).

However, an even more important aspect regarding acceptance is the integration of different and possibly contrary interests into policies for multifunctionality. In this respect, several authors document that landscape planning does not adequately allow for the integrated consideration of nature conservation and agriculture (Roth 1996; Küpfer 1997; Krahl and Splett 1999; Exler 2002). It is particularly necessary to co-ordinate landscape planning with agricultural planning (Roth 1996; Roth and Schwabe 1999), agricultural support programmes (Uppenbrinck and Gelbrich 1996), and regional marketing initiatives (Falter and Stadler 2000).

The basic tool policies may apply in order to allow for such integration is the **participation of farmers and other stakeholders**. Concerning the implementation of the Natura 2000 network and the WFD, Jünger (2001) and the SRU (2004), respectively, find that, so far, these are lacking appropriate participation procedures. Yet, both issues have hardly been subject to research. Moreover, several authors require participatory approaches in the context of planning (Küpfer 1997; Bruns 2000; Kühnbach 2000; Exler 2002; Gruehn and Schiller 2002). Consequently, the SRU (2002) and Siegel (2003) call for an explicit legal constitution of participation. Renn and Oppermann (1995) and Oppermann (2000) provide an overview of a variety of economic and sociological literature on mediation and participation. Based on this survey they emphasise that participation must go beyond hearings and be characterised by open results, neutral and qualified mediation, and proactive communication. Similar advises are provided for the setting up and management of nature reserves (Donner and Schmidt 2000; Krüger 1999; Ostermann 2000). Popp and Hage (2003) highlight that nature park authorities have to switch from pure administration to active moderation in order to allow for participation. Moreover, Weigelt (2000) states that the existence of a central authority to co-ordinate different types of nature reserves in one certain region is particularly useful for the corresponding participation processes.

Furthermore, Arzt et al. (2002) point out the importance of (local) stakeholder participation for designing AES in order to increase efficiency, effectiveness, and acceptance as well as actual demand of those schemes. In particular, local stakeholders, such as farmers and environmentalists but also representatives of administrations and associations at local and *Landkreis* level play an important role; yet, their initiatives – and bottom-up approaches in general - need to be accepted and supported by the respective political and administrative authorities at higher levels (see also Buchta 2001; Jungcurt et al. 2004; Müller et al. 2002). However, participatory approaches vary largely in their respective goals and they are – of course - not restricted to agri-environmental issues, but often address more general issues of (local) rural development (see, e.g., Bahner (1996, 2000); Böcher (2002); Mehwald (2002); Friedrich and Kügler; Korf (2001) reflects on the Participatory Rural Appraisal (PRA) approach).

Luick et al. (2004), looking at contractual nature conservation schemes, stress that such voluntary schemes have to include elements of moderation and mediation in order to allow for an adequate implementation. In this regard, the establishment of Landcare Groups founded by local authorities, nature conservation associations, and land users in order to improve mutual information exchange and co-operation, proves to be particularly beneficial (Güthler and Tschunko 1999; Speer 2000).

For water protection policies, such as water protection reserves, Flaig et al. (2002) and Weingarten and Kreins (2003) recommend that those policies should rather be implemented by local schemes building on voluntary co-operation between local authorities, land users, and water suppliers - an approach that is already applied in some *Laender*. They are basically supported by Bach and Frede (1995) who, however, emphasise that still binding regulations are needed to control farmers who are not willing to co-operate. Flaig et al. (2002) highlight that water protection policies must not only impose usage restrictions, e.g., in the context of water protection reserves, but have to involve adequate consulting activities as well. Information on site-specific requirements appears to be particularly important. Flaig et al. (2002) demonstrate that this strategy will not only improve implementation but, moreover, provides advantages for farmers since land users who have joined consultation initiatives account for higher incomes than those who did not. Nevertheless, they admit that consulting activities usually concentrate on problem areas and, consequently, do not allow for comprehensive nation-wide water body protection. Other policy fields, where participative approaches are recommended, include large-scale nature conservation projects (Baranek et al. 2004; Bruker 2004), integrated regional nature conservation projects (Brendle 1999) as well as regional marketing initiatives (Besch and Hausladen 1999; Luick 2002) and forest certification approaches (Runkel and Burgbacher 2001; Lippe and Baumgarten 2000).<sup>22</sup>

Literature highlights a variety of aspects that may affect the **demand** for incentive-based policies. One aspect particularly emphasised in the literature reviewed is the importance of contract design and application process for the demand. Consideration of information and application costs in the framework of (scientific) demand analysis is insufficient often due to methodological difficulties (Reiter and Roggendorf 2002). Based on “multiplier surveys”, Reiter and Roggendorf (2002) point out that difficult application documents as well as “single applications” instead of “accumulative applications” increase the information and application costs and, thus, influence the demand of farmers negatively. Considering the example of the local AES designed for the “Nature Park West-Havelland”, Buchta (2001) highlights the importance of scheme continuity and trust for (potential) demand. Furthermore, Baudoux (2001) explicates that there is a significant link between the lack of flexibility in scheme design and decreasing demand. The fixed duration of contracts within AES (5 years) required by the EU is discussed by Stern (2003). Such inflexible timeframe would ignore the economic and personal perspectives of farmers and, thus, would influence the demand negatively.

Gottlob (2004) analyses the impact of administrative procedures and requirements on the demand of afforestation programmes under Reg. (EC) No. 1257/1999 and within the GAK. He finds that the majority of participants consider both the approbation of afforestation according to the *Laender* Forest Acts and the application of financial support to be necessary and simple, although the administrative processing time should be speeded up. Moreover, Ahrens and Pirscher (2004) identify that existing property rights arrangements in the new *Laender* – here, most agricultural firms farm leased land and, thus, only have the right to

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<sup>22</sup> In the context of regional marketing initiatives and forest certification, the problem arises that those policies do not only have to build on acceptance of land users but also of consumers addressed. An empirical study by Luick (2002) advises that marketing initiatives have to account for transparent and comprehensive information, quality safeguarding, and guarantee systems. In particular, large varieties of marketing labels and certificates diminish consumer confidence in such approaches (Schweppe-Kraft 2003; Thoroe 2003). Consequently, it appears to be useful to concentrate related marketing initiatives under one label (Hermann et al. 2003).

cultivate it but not to rededicate it - are a major barrier to afforestation. To overcome this obstacle, they suggest foundations which buy land from tenants and lease it to farmers willing to afforest. This solution is particularly useful if farmers have leased acreage from a large variety of tenants and if transaction costs are high. Considering EU afforestation support, Thoroe (1997) emphasises that the low demand for this scheme is particularly due to the fact that EU financial support for farmland is usually higher than for afforestation.

Some literature focused on the importance of payments as a factor of influence for the demand of promotional activities. For Osterburg (2001), the demand for supporting measures depends, among other things, on the budget which is mobilised by the respective *Land*. Osterburg et al. (1997) and Zeddies und Doluschitz (1996) refer to high opportunity costs as explanation of low demand in some areas. Schramek (2001) follows this argumentation and gives a substantial description of reasons for demand and non-demand of AES. Using survey methods and based on a sample of 22 case study regions in nine EU Member States, including two case studies in Germany, he shows that 79 % of the farmers surveyed stated financial reasons as the primary reason for participation in AES. In contrast, Ahrens et al. (2000) argue against the decisive importance of premium levels for participation, and advise rather to overcome “psychological” abashments for participation, such as negative attitudes and scepticism against interventions in confided operating procedure or against the scheme itself.

Some authors examine particularly the correlation between land use characteristics, i.e., local natural conditions and demand for AES. Based on regional data analysis (Osterburg 2000b) and correlation analysis (Osterburg 1999), it can be shown that demand for AES is significantly higher in regions with relatively poor natural conditions, e.g., poor soil quality, mountainous region, as well as in regions with low average yields, low stocking rates, and low land use intensity. Taking organic farming as an example, Stolze (1997) highlights the influence of (missing) income alternatives and poor natural conditions on the demand for respective support schemes for the new *Laender*. Finally, the extent of compulsory environmental requirements in AES is discussed in relation to demand. Here, Ahrens et al. (2000) reveal that the demand for those schemes decreases if the related requirements are increasing.

### ***Monitoring and Enforcement***

A *first* problem identified in the literature regarding monitoring is the inadequate determinateness of programme regulations. Such shortcomings may hamper, for example, the effective monitoring of Natura 2000 sites (Stüber 2000), water protection contracts between farmers and water suppliers (Kremp et al. 2002), and large-scale nature conservation projects (Scherfose 1994; Wey et al. 1994). Additionally, Jessel (1998, 2002) detects that, in the context of the impact mitigation principle, the arrangement of monitoring competencies between local authorities and superordinated regional agencies is often unclear.

*Second*, if specified, the monitoring of programme requirements may be subject to technical difficulties. Jungehülsing (2000) demonstrates that surveillance of GFP requirements may call for continuous monitoring and has to account for additional impacts, such as soil composition and weather. In particular, the ex-post monitoring of fertiliser application proves to be difficult (Bach and Frede 1995; Barunke 2001).

*Third*, monitoring procedures may only be adopted inappropriately if executing authorities lack financial resources and personnel – a problem that is detected in the context of the implementation of nature reserves (Bibelriether et al. 1997), regional planning (Reinke 2002), large-scale nature conservation projects (Haaren et al. 1997), and the Federal Nitrate Directive (Flaig et al. 2002). Considering afforestation under Reg. (EC) No. 1257/1999, Gottlob (2004) highlights that forest authorities are hardly familiar with the IACS monitoring standards.



Hanf (1993) shows in a model discussion the advantages of high contract penalties for the design of contracts and regulations which aim at environmental protection. However, concerning the practical implementation he states various reasons against high contract penalties, e.g., a) it would be a breach of the basic principle of “comparativeness”, and b) there are economic reasons against the excessive use of high contract punishments. The mere existence of high punishments for relatively unimportant delicts can result in small marginal determent (Grenzabschreckung) for more severe delicts. Further, a too (perceived) probability of being wrongly accused and punished will put off potential contractual partner.

## 5 Current Research: Where Are the Gaps?

There is hardly any research work addressing the question under what conditions a policy with multifunctional purposes and multiple goals is indeed more efficient and/or more effective than policies addressing these goals separately. This includes the question how policies with multifunctional purpose have to be designed to address multiple goals in an efficient and effective way. For example, is cross compliance indeed efficiently promoting income and environmental goals at the same time?

The scientific debate on policies with multifunctional purpose is very much focused on designing and implementing optimal instruments or tools, rather than looking for optimal institutional arrangements of property rights and matching forms of governance, taking also into account the actor’s characteristics and the very nature of the targeted transaction. For example, to be able to compare different policies with respect to their efficiency and effectiveness, one has to consider the costs for developing and maintaining the respective institutional structures and forms of governance. Furthermore, the actual process of designing policies with multifunctional purpose, e.g., using various forms of participation, has hardly been investigated.

When addressing policy issues the multifunctionality paradigm commonly used refers to the technical jointness, i.e., the multifunctionality of production activities (that is also true for the policies themselves). However, the institutional jointness, i.e., the multifunctionality of farming or forestry systems, e.g., family farm or specialised corporation is hardly addressed. Here, changes in multifunctionality derive from changes in the institutional form of farming and in the institutional arrangements related to farms.

No research work could be found investigating the development of new “markets” for, e.g., biodiversity and other non-commodities, which would indeed be attractive for farmers. Here, future research should focus on the involvement of farmers as providers in the process of creating those new “markets”.

The reviewed literature with regard to setting up and managing voluntary, incentive-based policies is very much biased towards AES, in particular, those designed and implemented under the EU Rural Development Regulations. Yet, the comparison of research work on the impacts of different AES is hampered by an often imprecise use of relevant terms, such as efficiency, effectiveness, acceptance, and demand. In contrast, there is only a comparatively small body of scientific literature for policies, such as LEADER, LIFE, Contractual Nature Conservation Schemes, organic farming, etc. The same is true for policies addressing the production of renewable resources, energy crops, tourism, etc.

Furthermore, there is little *empirically based* research on the effectiveness of AES for reducing market surplus and on the choice of the optimal allocation level for policies with multifunctional purpose

So far, command-and-control policies, such as regional planning, protected areas, and the impact mitigation principle have mainly been subject to research in the field of nature

conservation and jurisprudence, whereas economic analyses are lacking. Referring to the analysis of GFP in forestry, Winkel and Volz (2003) identify that, so far, research has mainly been undertaken in the field of natural sciences, whereas more interdisciplinary approaches would be necessary. Moreover, scientific monitoring of political processes in the context of GFP, e.g., further specification and regionalisation, would be useful.

Research on EU policies that have been implemented recently in Germany has only started: Concerning the WFD, only the appropriateness of administrative levels for river basin management has been investigated so far. Further studies on implications, evaluation, and management are not yet available. Similarly, research in the field of the Natura 2000 network mainly concentrates on the technical appropriateness of implementation efforts. Scientific approaches to effectiveness and efficiency of the network itself are still lacking. Moreover, research on issues of management of the network, such as stakeholder participation, might appear to be promising.

The acceptance of forest certification has not been examined sufficiently yet. A comparative analysis of the two existing certification systems from an institutional point of view should be taken into account, in particular, applying institutional economics for analysing the role of different certification systems (e.g., certification of single forest enterprises or entire forest regions) for the demand.

Scientific literature, discussing the implementation of the Programme for the Establishment and Protection of Natural Areas and Landscapes of National Interest is mainly descriptive; in-depth analyses with respect to goals and design are lacking.

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