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**TOP-MARD  
Towards a Policy Model of Multifunctional Agriculture  
and Rural Development**

**Literature review Austria**

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**1. Multifunctional agriculture and rural development – a focus on the national discourse<sup>1</sup>**

Starting from discussion in some small European countries (particularly Switzerland, Austria, Norway and Finland), multifunctionality has gained particular recognition in different international arenas over recent years. FAO, OECD and EU-Commission have all intensified studies on the issue. Some of the work has been strongly influenced by earlier work on “Sustainable Agriculture and Rural Development” (SARD) carried out by FAO (1995), based on the following criteria:

- To ensure that the basic nutritional requirements of present and future generations, qualitatively and quantitatively, are met while providing a number of other agricultural products.
- To provide durable employment, sufficient income, and decent living and working conditions for all those engaged in agricultural production.
- To maintain and enhance the productive capacity of the natural resource base as a whole, and the regenerative capacity of renewable resources, without disrupting the functioning of basic ecological cycles and natural balances, destroying the socio-cultural attributes of rural communities, or causing contamination of the environment.
- To reduce the vulnerability of the agricultural sector to adverse natural and socio-economic factors and other risks, and to strengthen self-reliance.

The multifunctionality concept developed thereof refers to the characteristics of joint production by referring to the fact that as well as producing food and fibre, agriculture also affects other aspects of quality of life. Agriculture may support the vitality of rural communities through maintaining family farming, rural employment and cultural heritage. It

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<sup>1</sup> This chapter draws information from the Austrian National Report (Wiesinger and Dax 2003) carried out for the EU - Project Strengthening the Multifunctional Use of European Land (EUROLAN) which highlights the main literature available on the issue in the national context. Some of the international references have been included into this presentation as they are of particular relevance to the discourse.

also can contribute positively to biological diversity, recreation and tourism, soil and water systems, bioenergy, landscape, safety issues and the welfare of animals – but none of these outcomes are automatic – they often require policy mechanisms to facilitate them.

FAO points out agricultural systems to be intrinsically multifunctional. Ever since the first crops and animals were domesticated some 10,000 years ago, agricultural systems have fulfilled more than just their primary objective of producing food, fibre and fuel. Agriculture also produces a wide range of non-food commodities and services, shapes the natural environment, affects social and cultural systems, and contributes to economic growth. Evolving from SARD, the concept of the multifunctional character of agriculture and land is defined as the entire range of associated environmental, economic and social functions of agriculture. The concept encompasses the multiple goods and services generated by agriculture (and related land use). Analysis of the multifunctional character contributes to understanding the combination of potential synergies and trade-offs necessary to achieve sustainability in agriculture and rural development (FAO 1999).

Rosset (1999) Executive Director of the Institute for Food and Development Policy (IFDP) in Oakland, U.S.A. claims that small farms are multifunctional and more productive, more efficient and contribute more to economic development than large farms. Small farms can also make better stewards of natural resources, conserving biodiversity and safeguarding the future sustainability of agricultural production. The ongoing process of trade liberalization, being taken forward in the negotiations of the World Trade Organisation (WTO), had dramatically negative effects on small farmers in all parts of the world. In regions with a high portion of small-scaled farming systems, and especially mountain areas (Bryden et al. 2005), the preservation of multifunctional aspects of agriculture seems therefore particularly important.

In Austria numerous of these aspects have been addressed in the discussion on the functions of agriculture going beyond its production function since long. In particular, the regional function carried out under rather unfavourable production conditions was seen to provide a basis for respective instruments in a context of marginalisation. Multifunctionality thus got direct relevance for agricultural policy. According to the national Agricultural Act (1992) and within the framework of CAP the national agricultural policies have to acknowledge a competitive agriculture and forestry in viable rural regions maintaining social and environmental sustainability and balance between the regions. Special emphasis is put on the support of mountain regions and less-favoured areas (para 1 lit. 1), pluriactivity is understood as core concept to generate employment in rural regions (para 1 lit. 2), agricultural production, processing and marketing has to consider the special demand of the market (para 1 lit.3), and farmers should be enabled to participate in society and technological development (para 1 lit. 5). Moreover, agricultural policy has the objective to compensate natural disadvantage, to guarantee the supply of high-quality food and fibre, to safeguard natural resources such as soil, air and water, to sustain natural and cultural landscapes and to protect against environmental hazards (para 1 lit. 6).

The Austrian Federal Minister of Agriculture, Forestry, Environment and Water Management expressed the attitude towards the concept of multifunctionality with the following words: “The OECD agricultural ministers’ declaration on agricultural multifunctionality on 5<sup>th</sup> March 1998 has established the principle of multifunctionality in agriculture and forestry and acknowledged the multiple services of agricultural holdings on an international level. Now multifunctional agriculture became an important issue not only within the EU where sustainable family farming on the whole territory has been a principle for a long time. This development gains importance against the backdrop of WTO negotiations. It will be decisive

to establish fair rules for supporting environmental and social performances and services carried out by agriculture. Positive externalities of agriculture and forestry should not be sacrificed to the principles of market liberalism” (ÖVAF 2003).

Multifunctionality has been viewed as a relevant concern and an increasingly important topic in the agricultural *and* rural development policies in Austria since the beginning of the 1990s. There has been intensive discussion on positive valued non-commodity outputs since then. The discussion on negative externalities is not so intensive but there are also various studies existing (Sinabell 2001). Elements and indicators which constitute multifunctionality (both negative and positive external effects) have been listed by several authors and the overview of the most important concepts is included in the case study area report (Dax et al. 2006, Table 5.1 and 5.2).

While multifunctionality became an eminent feature within the last few years the number of agricultural holdings has declined at a slow pace and in some inner-mountain regions we can witness an extension of woodlands by afforestation. This process of land use change is going on rather slowly so it is not recognised as a major problem by the public. Yet, the underlying marginalisation processes are more important when addressing rural development, social and economic problems like unemployment, rural poverty, migration and over-aging of population, and the degradation of amenities, infrastructure and services in remote areas.

Austria has an extraordinary portion of less-favoured areas (LFA) assigning more than 70% of utilized agricultural area (UAA) or about 80% of the total national area to mountain areas, less-favoured areas or small areas classification. Therefore farmers in a huge part of the country are eligible for the compensatory allowance scheme which alleviated economic constrain and large-scale marginalisation (Dax and Hovorka 2004). However, on a general level agricultural employment is declining like in other European countries. Particularly for small-scaled farmers there is hardly a sufficient income perspective and marginalisation issues become relevant. This is also an indication for structural change and concentration processes which might have a negative impact on multifunctionality.

This special emphasis on the support of mountain regions and LFA is supplemented by the widespread feature of pluriactivity as the core concept to generate employment in rural areas. Agricultural production, processing and marketing has to consider the special demand of the market, and farmers should be enabled to participate in society and technological development. Moreover, national agricultural policy places a high priority on the objective to compensate natural disadvantage, to guarantee the supply of high-quality food and fibre, to safeguard natural resources such as soil, air and water, to sustain natural and cultural landscapes and to protect against environmental hazards.

The focus on agricultural initiatives and the widespread involvement in pluriactivity farm households are very important for combating marginalisation and land abandonment in the specific regional contexts. Approximately 60% of all farms in Austria are part-time-farms integrating agricultural and non-agricultural activities for enhancing their income. Pluriactivity plays an important role in sustaining cultivation, settlement, landscapes and cultural viability. High mountain regions and some less-favoured regions are particularly endangered by marginalisation of agricultural land use due to the lack of productivity. Agriculture in connection with settlement, socio-cultural and economic activities can only be maintained by pluriactivity in these regions. Moreover agricultural diversification and para-agricultural activities (Dax et al. 1995, Loibl 1997) like food processing, direct marketing, processing of non-food products (e.g. medicines, cosmetics etc.), farm-cooperation (e.g. machinery rings), the providing of social services (schools, kindergartens, care places for

elderly and disabled persons, drug and alcohol addicts, homeless etc.) also contribute to the farmers' income and alleviate structural problems.

In Austria about 65% of all financial means of CAP are spent for rural development measures (BMLFUW 2005a and 2005b). This is an extraordinary high proportion compared with all other EU countries (Dax 2005). Austria holds a leading position both in the implementation of agri-environmental measures and payments in less-favoured areas, and nationally the co-financing requirements could be secured. The Austrian programme for rural development focused in the period 2000-2006 on the objective of a sustainable, multifunctional agriculture and forestry in a viable rural area. This target is reflected also in the current strategy for the new period 2007-2013. In addition to the two big instruments of the programme, the agri-environmental programme (ÖPUL) and the LFA scheme, the performance of agriculture and forestry is also supported through investment aids, infrastructure support, diversification measures and a particularly increased support for the Leader measures (BMLFUW 2006). As a result only an appropriate patchwork of different agricultural and non-agricultural policies associated with various economic, social, environmental and cultural functions can foster sustainability and viability in rural regions and combat marginalisation successfully.

The attached literature review comprises sources particularly relevant for the Austrian context and in a broader sense the case study area Pinzgau – Pongau, Austria. As far as available abstracts on the contents of studies of particular significance are included (chapter 3). A considerable part of the references listed in chapter 2 are referred to in the study area report highlighting positive and negative external effects and the relevance of multifunctionality issues in the Austrian situation.

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### 3. Abstracts of selected references

Aubrecht, P. and Petz, K. (2002) *Areas protected under nature conservation laws in Austria*. Umweltbundesamt, Monographien; Band 134; Wien.

The aims of nature protection are closely linked to aspects of space and area. Every form of nature protection, no matter whether it is species, biotope or landscape protection, presupposes a certain amount of space. The availability of space and area is an important prerequisite for nature conservation. The areas and sites are in correlation with the relevant protection types and, depending on the type, are subject to specific spatial management. The publication is intended as a reference giving an overview of current sites where there is a close connection with the aims of nature protection and where specific protection targets and types (as laid down in the legal ordinances) can be identified. Also, this publication intends to show how varied the implementation of nature protection is in Austria, due to the distribution of responsibilities, in terms of the number and extent of sites of nature protection significance. In Austria, about 25 % of the surface area is protected under different categories of area protection. The categories nature reserve, landscape protection area and nature monument can be found in all federal provinces. Other categories are limited to one or a few of the federal provinces. In total, 14 different categories of protected sites can be found in Austria, with varying degrees of protection. The exact requirements of protection are stipulated for each site in the relevant ordinance. Usually agriculture and forestry, hunting and fishing are allowed to continue "on the same scale as before", which sometimes leads to conflicts of interest. Apart from the sites protected by nature conservation laws, there are other sites not explicitly protected but still ecologically important. All sites of nature protection significance that are presented in this publication have been entered into the database of the Federal Environment Agency, as well as details referring to their names, categories, areas, ordinances and locations. With the assistance of the governmental authorities of the federal provinces, the digital site boundaries are recorded at the Federal Environment Agency and stored and administered in a Geographic Information System.

Baaske, W. and Villani, O. (1996) Abgeltungen für Leistungen der Landwirtschaft aus Sicht der Konsumenten. In: Der Förderungsdienst; 44 10/1996. S. 323-325, 328-332, Wien

The authors carried out a kind of demand side valuation. The objective was to estimate the use value local residents obtain from open landscapes and unspecified other non-commodity output of agriculture. Based on the responses to the question "what would you be willing to pay for agriculture in your neighbourhood", Baaske and Villani obtained an aggregate estimate of 1.3 billion ECU.

Bosshard, A. (2003) Actual and potential role of organic and traditional agriculture for the conservation of biodiversity. In: Stolton S, D. Metera, B. Geier & A. Kärcher (eds.) *The Potential of Organic Farming for Biodiversity*. Münster (Landwirtschaftsverlag), p. 67-76

The positive effect of organic farming on the biodiversity of cultural landscapes compared with intensive conventional agricultural systems is proofed manifold. Organic farming therefore is considered as a important partner within comprehensive, holistic strategy for a sustainable conservation and development of biodiversity. The requirements of organic farming as presented in the organic farming standards contribute to biodiversity, for example, by no use of chemical fertilisers, no use of synthetic pesticides and limited number of animals per area. As a result of these restrictions the farmer has a particular economic interest in a functioning, stable and diverse ecosystem of beneficial organisms. However, with regard to biodiversity issues and nature conservation this is not sufficient. Additional measures are necessary. In respect to the future role of organic farming for biodiversity conservation three important questions are yet not sufficiently answered: (i) what is the established contribution of organic farming to biodiversity conservation in relation to the aims of the biodiversity convention and modern biodiversity concepts?, (ii) what are the mechanisms of the positive biodiversity effect of organic farming?, (iii) how far could and should the contribution of organic farming be improved and optimised?, where are specific potentials, where basic limit?

Buchgraber, K. (2003) Wächst die Kulturlandschaft im Berggebiet zu? In: *Ländlicher Raum* 2/2003, Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft Wien.

This publication focuses on the general importance of grassland in an ecological and in an economic point of view, especially for the income of grassland and livestock farmers. Beyond that, some additional benefits like the refinement of forage in livestock farming, the preservation of the cultural landscape, biodiversity and the resources of soil, water and air are discussed. The multiplicity, the different types of utilisation of grassland and the influencing factors of production is also considered.

Bundesministerium für Land- und Forstwirtschaft (BMLF) (1996) Ökologische Evaluierung des Umweltprogrammes ÖPUL Band 1 und 2. Bericht des Bundesministerium für Land- und Forstwirtschaft an die Europäische Kommission gemäß Artikel 16 der VO (EG) Nr. 746/96, Wien.

Bundesministerium für Land- und Forstwirtschaft BMLF (1998a) Evaluierung des ÖPUL 95. Bericht 1998 und Bericht 1998 - Anhang. Bericht des Bundesministeriums für Land- und Forstwirtschaft an die Europäische Kommission gemäß Artikel 16 der Verordnung (EG) Nr. 746/96, Wien.

Groier, M. (2004) Sozioökonomische Effekte im Rahmen des Österreichischen Programms für die Entwicklung des Ländlichen Raums (Mid Term Evaluierung), F&F 27 der Bundesanstalt für Bergbauernfragen, S. 58

In order to cope with the sustainability of agricultural operations the Austrian government introduced in 1995 the "Austrian Program for Sustainable Agriculture" (ÖPUL). In 2000, the ÖPUL follow-up programme was started, which considers measures for a sustainable and water-protective agriculture. Through ÖPUL farmers receive under well-defined conditions, payments for their sustainable agriculture (e.g. limiting the use of fertilizer), co-financed by the EU. In the context of ÖPUL the condition of the Austrian land was presented, development tendencies were pointed out and preventive measures were suggested. By the end of 2003, a mid-term evaluation of ÖPUL was finalised, which included scientific studies on the success of the programme. The possibilities of land-protection in Austria shown by the ÖPUL publications are being used as a scientific basis for agricultural aid-management.

MacDonald, D., Crabtree, J.R., Wiesinger, G., Dax, T., Stamou, N., Fleury, P., Gutierrez Lazpita J. and Gibon A. (2000) Agricultural abandonment in mountain areas of Europe: Environmental consequences and policy response. *Journal of Environmental Management* 59 (1), pp.47-69, Amsterdam-Oxford.

Agricultural abandonment reflects a post war trend in Western Europe of rural depopulation to which isolated and poorer areas are most vulnerable. The commercialisation of agriculture, through technological developments and the influence of Common Agricultural Policy, has transformed traditional approaches to farming. The problems that these trends create are particularly marked in mountain areas where land tends to be less fertile, less easily worked and communication and transport networks are restricted by physical limitations. Thus mountain areas represent the combination of socio-economic hardship and greatest physical constraints to agriculture, resulting in reduced economic viability of farming. The social and economic impacts of these changes have been well documented. However, the implications for environmental policy are less well recognised. This paper uses a comparative analysis of European mountain case studies to assess the environmental impacts of land abandonment and decline in traditional farming practices. It was found that abandonment was widespread in the case study areas and that while the influence of environmental changes was unpredictable due to environmental, agricultural and socio-economic contextual factors, the impacts of abandonment were generally, but not universally, seen to have an undesirable effect on the environmental parameters examined. The application of agri-environment policy measures in relation to abandonment is discussed and suggestions for future policy are proposed.

Crabtree, B., MacDonald, D. and Hanley, N. (2002) Non-market benefits associated with mountain regions. Report for Highlands and Islands Enterprise and Scottish Natural Heritage. CJC Consulting, Aberdeen.

The aim of the study was to review the provision of non-market benefits in mountain areas and assess the scale of different non-market benefits in upland Scotland, in order to inform future policy decisions concerning support for mountain areas. The remit identified three elements: (i) to identify the non-market benefits delivered in mountain areas; (ii) to quantify, as far as possible the likely scale of the non-market benefits in mountain areas of Scotland; and (iii) to provide case study examples of the range of possible non-market benefits and the types of policy instruments that might be used to implement relevant policies. The main non-market benefits in mountain areas are derived from biodiversity, wildlife and landscape, recreation opportunities, cultural heritage and hydrological protection. No economic valuation studies were found on the benefits that society derives from the cultural heritage or the maintenance of population and socio-economic activity in mountain areas. There is a need for further research to quantify these public benefits. Mountain areas produce a wide range of non-market benefits valued by the public. Most of the quantitative evidence from economic valuation studies relates to environmental, recreational and landscape benefits. There is little quantitative work on the value attached by society to cultural identity and the maintenance of rural communities and cultures. Mountain areas face major climatic and territorial disadvantages and this has provided the basis for distinctive policy measures under the CAP. The analysis in this study indicates that there may be significant locational differences in the extent to which future support can be justified by the environmental and cultural goods produced. In Scotland, areas of high conservation and tourism interest where farming contributes to the biodiversity and landscape would feature highly, as may crofting areas where the cultural value could be high. Whatever form policy takes, mountain areas will be best able to compete in the policy arena if there is adequate evidence to support their case. This study has demonstrated that the benefit valuation literature can be used to underpin policies to support the environmental goods produced by mountain areas. But this only provides a partial case. Further work is needed to quantify the benefits from policies that support communities at risk and the cultural heritage, and to quantify the links between environmental quality, cultural heritage and benefits from tourism.

Dax, T. and Wiesinger, G. (1998) *Mountain Farming and the Environment: Towards Integration, Perspectives for mountain policies in Central and Eastern Alps*, Forschungsbericht Nr. 44, Bundesanstalt für Bergbauernfragen, Wien.

This study which was co-ordinated by EUROMONTANA envisaged the use of existing networks of knowledge and political representation of European mountain areas. Thus, at the outset of this study, a geographical network of six regional European mountain areas and 25 study areas was established, including a wide spectrum of different physical and socio-economic situations. European uplands and mountain areas are characterised by a unique and complex but very fragile system, connecting the dynamics of ecosystems with economic development, human settlement, recreational pursuits etc. Although mountain regions are somewhat heterogeneous, when comparing the Central European with some Mediterranean mountain ranges and especially with mountains in Northern Europe like the Scottish Highlands, for example, we find a lot of common features and similarities between them. In any respect, mountains are the location of important resources and assets indispensable for the development of human society and the supply of downstream, flatland and urban areas. In particular, they play an important role in terms of biodiversity, valuable habitats, water towers, energy and fresh-air supply, recreational sites, but also with respect to cultural heritage. When focusing on land use systems, we can see that farm management methods have developed through a long-term process, and thus have shaped and modified the natural and cultural landscapes, particularly in high mountain regions, according to the specific climatic, historical and socio-economic conditions. Evidently this situation is reflected in a wide range of different traditional land use and management systems. So agriculture has, on the one hand, formed the environment, but the environment has likewise an important influence on the specific forms of agricultural production. In addition, one should not underestimate the impact of the close links between the natural environment and the cultural and lifestyle patterns of the population in mountain regions. In fact, much of the environmental capital makes an outstanding contribution to our cultural capital, valued through its links to distinctive human activities past and present. European mountain areas are no longer remote and isolated places,

excluded from the general development of the modern industrial societies. As a result there is considerable impact on the balance of the mountain ecosystems, which are threatened by different pressures imposed by the human society. In large parts of European mountain areas, drastic changes in the agricultural structure and land use systems can be observed in terms of emigration and land abandonment, forest management, changes in livestock density and animal husbandry systems etc. These changes are frequently accompanied by a considerable decline of biodiversity, loss of natural and cultural landscapes, an increase of natural hazards, forest degradation and forest fires, eutrophication problems, water pollution, soil degradation etc. The recent initiatives for the promotion of mountain policies at the regional, national and European levels reflect a continuing concern for the economic and social pressures facing mountain farming. Gradually, it has come to embrace a vision that the sensitivity of mountain ecology should not just be seen as a problem, but possesses a set of options capable of turning their uniqueness into a rural development asset.

Dax, T. Loibl, E. and Oedl-Wieser, T. (1995) *Pluriactivity and Rural Development, Theoretical Framework*, research report no.34, Bundesanstalt für Bergbauernfragen, Wien.

The aim of this collection of papers of the "Research Programme on Farm Structures and Pluriactivity - Rural Change in Europe" in this reader is to give a comprehensive survey on essential analytical papers and of the different stages of the project. The major objective of this international research programme was to provide an assessment of the structural changes and of agrarian structural policy. The study carried out in 24 study areas in Western Europe considered the regional contexts crucial to the development chances respectively difficulties for farm households. In most European areas pluriactivity is the dominant feature of farm households and this stresses the importance of linkages to non-agricultural sectors. Main issues and results covered by the papers are: (i) Pluriactivity is a long-established phenomenon and not just the stage before withdrawing from agriculture. A large part of farm households have other gainful activities. (ii) Income from non-farming sources can be found throughout the farm size spectrum, though in proportional terms it appears to be more frequent among the smallest farms. (iii) Income levels are varying to a large extent. A rather clear notion of farm income, off-farm income and other income sources is needed to provide insights on the households. (iv) In order to study recent changes and development patterns a disaggregating of farm households into sub-groups which take into account not only the characteristics of the households themselves but also the economic environment is needed to provide sensible statements on different development paths.

Dax, T. and Hovorka, G. (2000a) Mountain policy and its contribution to the sustainable development of cultural landscapes in Austria, paper at the 3<sup>rd</sup> Conference of the European Society for Ecological Economics (ESEE), Vienna, Austria, 3-6 May.

The Austrian economic and territorial policy, in recognition of its overwhelmingly mountain topography, started to put particular importance on regional development of mountain areas and the impact on landscape very early. Since the early 1970s a special Mountain Farmers Support Programme has been established and meanwhile both this programme and specific regional policy measures have become a significant part of Austria's mountain policy with significant implications for sustainable regional development. The paper explores the integration of policies from different sectors and elaborates on the implications of recent evolutions of policy reform (Agenda 2000). The assessment of mountain agriculture in Austria particularly addresses the specific aims and measures conceived to support not just the agricultural sector but also the preservation and sustainable management of land resources under the difficult production conditions. The valuation of non-market goods which have to be included in comprehensive policy assessments targeting at sustainable development paths is central to this policy and is referred to in recent international discourse through the term "rural amenity". The particular relevance of the amenity character for the local/regional potential of regions, like the mountain areas, is discussed. To develop sustainable uses in peripheral, mountain regions largely depends on the ability to include such amenities as development potentials in regional concepts, to nurture the endogenous potential of local population and to induce appropriate initiatives for a balanced development of cultural landscapes and rural society in the mountain regions.

Wiesinger, G. and Dax, T. (2003) *Coping with Marginalisation and Multifunctional Land Uses*, Austrian National Report, EU-Project Strengthening the Multifunctional Use of European Land (EUROLAN), Wien.

This report indicates the state and perception of agricultural marginalisation and multifunctionality in Austria. In Austria marginalisation is considered as a multidimensional process encompassing not only land abandonment, environmental degradation and economic decay but also social and cultural patterns. Agricultural marginalisation can be seen as part of marginalisation in rural regions. Mutual interdependencies between each dimension of marginalisation are observed, enhancing, counteracting, diminishing or even not affecting at all the whole system. Agricultural marginalisation may imply economic, environmental and social marginalisation in certain regions, particularly in those regions where agriculture is still predominating. Land use change may have positive and negative externalities in terms of biodiversity, nitrate leaching, and other environmental issues. A decline in agricultural activities could exert an impact on the environment which may be interpreted in different ways. Furthermore the opinion of the various stakeholders on a specific situation or set of instruments may also differ according to their individual interests. Through portraying the different perceptions and attitudes of agricultural, regional and environmental development institutions and stakeholders in this report a national synthesis was obtained depicting the various positions. The dialogue is not restricted to agricultural land use but also considers the status and dynamics of natural environment, economic and regional development and the social structure. There is a national wide consensus that agricultural land use cannot be maintained by agricultural policies alone. Integration programmes combining regional, environmental, socio-cultural and economic development may also play a major role in combating marginalisation and land abandonment in rural areas. The findings of this report are derived from case studies and analyses, data sources on the agricultural, regional and environmental situation in Austria as well as the results of an expert workshop. Multifunctionality has been for long viewed as a relevant concern, and an increasingly important topic in the agricultural and rural development policies in Austria since the beginning of the 1990s. There has been intensive discussion on positive valued non-commodity outputs since then. The discussion on negative externalities is not so intensive but there are also various studies existing. While multifunctionality became an eminent feature within the last few years marginalisation is hardly applied in connection with agricultural land use in Austria because there is no large-scale land abandonment. Nevertheless the number of agricultural holdings has declined at a slow pace and in some inner-mountain regions we can witness an extension of woodlands by afforestation. This process of land use change is going on rather slowly so it is not recognised as a major problem by the public. Yet, marginalisation is more important when addressing rural development, social and economic problems like unemployment, rural poverty, migration and over-aging of population, and the degradation of amenities, infrastructure and services in remote areas. The term marginalisation of land or agricultural marginalisation is not explicitly applied in the Austrian context. Though there is no direct reference to the threat of abandonment in the legislative and scientific discussion, the problems of remote, mountain regions, the issue of out-migration (particularly of the young) and the loss of viability in large parts of rural areas takes a prominent place in regional policy discussion. However, there is consensus that, at least at present, marginalisation of land use as well as agricultural marginalisation is no staggering problem. Many experts assume that marginalisation might become a problem in the middle or long-term in more regions. Socio-economic and environmental patterns concerning, e.g. the loss of habitats and biodiversity, social exclusion and rural poverty are much more prominent in this regard than marginalisation of land use or abandonment of agricultural production.

Dax, T. and Hovorka, G. (2003) *Mountain policy in Austria: Its integrated approach to rural development and contribution to multifunctional landscape concepts*. In: Brandt J., Vejre H. (ed), *Multifunctional Landscapes. Volume II. Monitoring, Diversity and Management*, Southampton, WIT Press

The paper analyses and evaluates Austrian mountain-area policy, in particular mountain farming policy and elaborates on the implications of recent evolutions of policy reform (Agenda 2000) for the preservation and development of mountain areas, mountain farming and multifunctional landscapes. The high level of “rural amenities” in these regions also suggests the particular relevance of an approach addressing the multifunctional dimension of landscape management in regions such as the mountain areas.

Dax, T. and Hovorka, G. (2004) Integrated rural development in mountain areas. In: Brouwer, F. (ed.), *Sustaining Agriculture and the Rural Environment. Governance, Policy and Multifunctionality*. Cheltenham, pp. 124-143.

This contribution addresses the features of regional developments of mountain areas and calls for an analysis at a low geographical level, the inclusion of considerations on structural development and integrative concepts. It will therefore explore the experience on mountain policies in Austria and the particular role agricultural policy plays in the context. By presenting the activities and major driving factors of a small mountain regions, practical policy issues and the difficulties of market development in remote areas are discussed.

Wiesinger, G. and Dax, T. (2005) Coping with Marginalisation and Multifunctional Land Uses, Austrian Case Study Report Neunkirchen, EU-Project Strengthening the Multifunctional Use of European Land (EUROLAN), Wien.

Marginalisation is to be considered as a multidimensional process encompassing not only land abandonment, environmental degradation and economic decline but also social and cultural aspects. Agricultural marginalisation has to be viewed as a part of a complex system consisting of different social, economic and environmental patterns of a region where interdependencies between all the dimensions of marginalisation exist. As a matter of fact the term 'marginalisation' is not very often used explicitly in Austria. There is a lack of direct reference in the legislation and in the scientific discussion as well. However, problems such as environmental degradation, out-migration, unemployment, rural poverty, and loss of infrastructure, services, socio-cultural and economic viability in mountainous and/or remote rural areas take a prominent place in the national debate. While the term marginalisation is hardly used multifunctionality has been regarded since long as an important component of Austrian agricultural and rural development policies. The intensive discussion has attributed particularly positive values for non-commodity outputs of agricultural activities and its amenities for the development of rural areas whereas the attention for negative externalities has been less expressed in the past. There is no large-scale land abandonment in Austria due to policy priority for preservation of land use under unfavourable production conditions and the resulting emphasis on agricultural and regional development schemes which have already been introduced since the beginning of the 1970s. Austria consists of an extraordinary portion of less-favoured areas (LFA) assigning more than 70% of utilized agricultural area (UAA) and about 80% of the total national area to one of the categories of LFA, i.e. mountain areas, less-favoured areas or small areas classification. Therefore farmers in many parts of the country are eligible for the compensatory allowance scheme which alleviated economic constrain and large-scale marginalisation. Together the Austrian agri-environmental programme (ÖPUL), the LFA scheme, infrastructure support, diversification measures and a number of regional development initiatives (e.g. LEADER) provide an appropriate patchwork to combat marginalisation successfully. Nevertheless the number of agricultural holdings has declined gradually but in comparison to other European countries at a rather slow pace. However, in some remote regions we can witness an extension of woodlands by afforestation. Since the process of land use change is going on slowly it is not recognised as a major problem by the public in most cases. Agricultural pluriactivity and tourism play an important role in counterbalancing social and economic marginalisation. This is why the comparatively severest marginalisation problems are not encountered in the high mountain regions despite cold climate, poor soils or steep slopes but in regions mostly at the foothills of the mountains or close to the Eastern border where economic development has been lagging for decades. For testing the hypotheses just suggested in the first paragraph of this chapter dealing with the causes of rural and agricultural marginalisation and the perspectives of multifunctionality for coping with abandonment and marginalisation we selected the district of Neunkirchen as the Austrian case study area. Neunkirchen is situated in the southern part of Lower Austria outside the intensive high mountain tourist areas at the fringe of the Eastern Alps. In this region most marginalisation indicators that were developed in the first phase of the project are below the national average. With regard to agricultural development we can observe a decline in the number of holdings and utilized agricultural area. Forests and woodlands already cover a huge part of the total land area and its proportion is still increasing. In the field of economy traditional old industries have collapsed leading to a comparatively high unemployment rate with just very few options for the local people. Since mountains are not as high as in western Austria the preconditions for intensive tourist

industries are limited. Out-migration and overaging are common issues for large parts of the region. Nevertheless the crisis is not as harsh as one would expect by just analysing the indicators.

Dörr, H., Fiby, M. and Hilbert, A. (2005) *Die Zukunft der Landschaft in Mitteleuropa*, arp Arbeitsgruppe Raumplanung Planning, Training - Consulting - Research, Eigenverlag, Wien p. 108.

The occasion for this research project, which is a cross-boundary effort in terms of both geography and disciplines, was supplied by the ongoing retreat of agriculture from full territorial farming. One symptom, which is also a cause, is the increasingly looser bond to land and soil felt by 'traditional' land owners. Against a background of globally and regionally changing conditions for the economy and society, future 'patterns' for land use need to be investigated in a long-term perspective. Primarily, research should concentrate on open landscapes where it can be assumed that the course of future landscape changes has not yet been clearly fixed, so that there is still a chance for shaping the relevant processes. Even though the project starts out from the situation of farming, it does not remain bound to the system of agricultural structures, but rather looks into future options available to potential land users from farming, resource management or the leisure industry. In addition, it investigates the role of land markets and the consequences for 'natural' facilities of future landscapes. Special attention is given to the aspects of 'responsibility for the man-made landscape' assumed by various players and the transfer of responsibility attendant to the change of ownership structures. Using a dual approach (quantitative/qualitative analysis of representative regions and focusing of expert opinions as the result of a Delphi survey), a spatial projection and simulation model will be developed which permits imaging long-term landscape changes in a Central European context for regions, scaled by rural districts (Germany), political districts (Austria) or cantons (Switzerland). The scenario technique intended to be used is also expected to produce a better 'perception' of future land use patterns. The findings are to strengthen the long-term perspective in basic research and spatial politics.

Herzog, S., Hinterleitner, V. and Oedl-Wieser, T. (2005) *Gender-sensitive regional development – A necessary strategy for rural areas in Austria*. Jahrbuch der Österreichischen Gesellschaft für Agrarökonomie. Band 13. Vienna.

One vital task of regional policy is to ensure a high quality of life for the population in rural areas mainly through economic growth. Such comprehensive regional policy approaches for rural areas have to integrate all economic sectors and social groups. Gender-sensitive regional analysis in Austria show that gender specific inequality in regional development is increasing in times of socio-economic changes if there is no tendency to counteract e.g. through taken the structural category "gender" into consideration. In this contribution the necessity of a gender-sensitive strategy of regional development is discussed.

Hofreither, M.F. (1996) *Landwirtschaft und Nitrataustrag*, Bundesministerium für Land- und Forstwirtschaft, Wien.

Some of the changes in environmental policy to be expected after Austria's accession to the EU are presented. General statistics on the Austrian agricultural sector form the background of a review of research focusing on mineral emission of agriculture which covers the following substances: nitrogen compounds, phosphate, methane, and heavy metals. The analysis of policy shows that the predominant command and control approach failed to reach a major goal of Austrian environmental policy, the protection of groundwater resources. A short analysis of the levy on mineral fertilisers which was in force during the period 1986-1994 points out that political economy issues seem to be decisive whether such an instrument is effective or not. Finally an extensive list of research relevant for the topics is presented as well as a list of institutions carrying out research in this field.

Hofreither, M.F. and Sinabell, F. (1998) *The Austrian levy on mineral fertiliser - selected observations*. In: *Economic instruments for nitrogen control in European agriculture*. Proceedings of the 1st nitrotax workshop, pp-67-78, Reggio Emilia.

Due to the inelasticity of demand for fertilisers, it is likely that a fertiliser tax will probably not change the quantity of fertiliser used. Therefore we recommend a hypothecated tax on fertilisers, where the revenues raised are used to clean up the water. We also suggest giving payments to farmers to switch

crops, i.e. to organic produce. Thus, a suitable policy option to address one cause of water contamination would be a fertiliser tax plus payments to organic crops. Some evidence of the effects of a nitrogen fertiliser tax can be gauged from the experience of Austria's levy on fertilisers 1986-1994 (it was abolished on Austria's entry to the EU in 1995). Hofreither and Sinabell show that the levy was first introduced to secure revenues to assist with the financing of net grain exports from Austria in the 1980s. They find a price elasticity of demand for N-fertilisers of  $-0.2$ . After the introduction of the levy, fertiliser consumption fell in Austria, but Hofreither and Sinabell show that the direct price effect of the levy contributed to only part of this change. Moreover, much of the impact of the levy was offset by reductions in the base price of fertilisers. What effect there was, they argue, arose from the fact that the levy acted as a signal to farmers, and the general public, about the 'scarcity' of the Austrian environment. The Austrian experience confirms the wider view that fertiliser taxes are likely to be imperfect instruments for securing reductions in nitrogen use so long as the focus is on the price elasticity alone. But it also suggests that economic instruments can have a 'signalling' effect, which leads to changes in behaviour.

Hofreither, M.F., Schmid, E. and Sinabell, F. (2000) *Ausgewählte quantitative Effekte des ÖPUL. Der Förderungsdienst* Nr. 10, pp. 83-90, Wien.

Agri-environmental measures aiming at extensification were adopted at a large scale by farmers and quantitative analyses based on models capturing causal relationships indicate positive effects of the environmental program. In order to back the assumption by empirical evidence it would be necessary to compare time-series data on environmental indicators over a longer time period or to have models at hand that are able to capture causal relationships between economic activity and environmental outcomes. Data are available only for the case of nitrates in water over a longer time period, but efforts are underway to regularly measure a diverse set of indicators in Austrian sample regions. The change in case prices for agricultural products fall are best guesses and not backed by empirical studies in Austria or by model results for the Austrian farm sector. One underlying assumption is that only output prices change while other variables are kept constant, in particular technology. This is a crucial assumption because model results for a region in Austria showed that choices about tillage practices (technology) have an important effect on environmental outcomes.

Hovorka, G. (2004) *Den Bergbauern wird nichts geschenkt. Evaluierung des Ausgleichszulage im Rahmen des österreichischen Programms für die Entwicklung des ländlichen Raums.* Forschungsbericht Nr. 52, Bundesanstalt für Bergbauernfragen, Wien.

Mountain farming plays a key role in safeguarding the sensitive ecosystem of mountain areas. The maintenance of mountain farming is therefore vital for the multifunctional landscape and the general living and working space. In Austria the compensatory allowances (including National Grant) were already a core instrument of support for the LFAs in the previous programme period. However, it showed some deficiencies. The new LFA support system within the Rural Development Programme brought some major improvements in favour of the mountain farms. The LFA payment schemes will be discussed in detail in this report.

Hovorka, G. (2005) *Evaluation of the compensatory allowances scheme under the EU regulation 1257/99 in Austria and in other EU Member States, contribution to the 87th EAAE –Seminar: Assessing rural development policies of the CAP, Vienna*

The landscape in Austria is characterised by the high proportion of less-favoured areas (LFA). The mountain areas still possess a high environmental quality and environmentally friendly agriculture and forestry extends over most of the mountain area. The paper addresses key questions regarding the evaluation and the achievements of the new compensatory allowances schemes in Austria and focuses on the extent to which it meets the main objectives for mountain areas and other less favoured areas. The complementary contributions of other RDP measures, such as the agri-environmental programme to fulfil the main objectives, are also discussed.

Jeschke, H.-P. (1999) Naturraumpotentialkartierung – Grundlage für die Darstellung der Multifunktionalität der Landwirtschaft. In: Quendler, Th. (1999): *Neue Strategien für die ländlich geprägten Räume Österreichs*. Sonderausgabe Juni 1999, Österreichischer Agrarverlag, Klosterneuburg, S. 83-91

By definition agricultural production in open space is producing ('cultural') rural landscape. Because of the tautological definition different technologies and intensities will result in a different type of landscape. The nature of a particular landscape, however, does not seem to be linked to the level of output if technology and cropping patterns remain unchanged. Jeschke provides inventories and maps in which the technical relationships that lead to particular types of landscape are described.

Klaasen, G. (1994) Options and costs of controlling ammonia emissions in Europe. In: *European Review of Agricultural Economics*, No. 21, pp.219-240, Oxford.

Options and costs for controlling emissions of the various substances are represented in the model by considering the characteristic technical and economic features of the most important emission reduction options and technologies. Regional and national potentials for emission control and the associated costs are estimated on the basis of detailed data on the most commonly used emission control technologies. The cost evaluation is based on international operating experience of pollution control equipment by extrapolating it to the country-specific situation of application. A free and competitive market for the exchange of emission control technology is assumed. Important country-specific factors with strong impact on abatement costs are the characteristic sulphur content of fuels, plant capacity utilization regimes, boiler sizes etc.

Knickel, K. and Renting, H. (2000) Methodological and Conceptual Issues in the Study of Multifunctionality and Rural Development, *Sociologia Ruralis*, 40 (4), p. 512-528.

The aim of this paper is to try and outline the complexity of rural development processes that specifically relate to the phenomenon of multifunctionality. 'Multifunctionality schemes' are introduced as a means for visualizing the complex interrelationships in rural development processes and to 'map' the functional relationships and specific reconfigurations in the use of resources such as land, labour, knowledge and nature that underlie them. In the discussion, reference is made to case studies from the impact research programme. The Rhöngold case is used to illustrate how MF-schemes can help to define micro-macro relations and facilitate their quantification. Several conceptual issues are addressed in relation to the translation of farm data to the regional level, indirect multiplier effects, substitution effects and the importance of synergy. Methodological complications are seen in problems associated with the acceptance of a paradigm shift; the inadequacy of available regional, national and European data sets; the complex nature of micro-macro relations; the difficulty of defining boundaries and reference systems; and the struggle with time, scale and space as critical modifiers of reality. The need to link the dimensions of agricultural and rural change demands a more multidisciplinary, holistic approach to analysis and conceptualization.

Knoflacher, H., Haunold, E., Loibl, W., Züger, J. and Urban, G. (1993) Ammoniak Emissionen in Österreich 1990 – Berechnung und Abschätzung sowie Regionalisierung auf Basis politischer Bezirke, Umweltbundesamt, Wien.

Balances for nitrogen clearly show that agriculture is contributing substantially to the Austrian nitrogen emission. The amount of mineral fertilisers spread in Austria is exceeding the amount of nitrogen which is accumulated in agricultural products. For most of the Austrian area (the mountainous region in the Alps) nitrate levels are balanced or even negative. Such data are helpful for general purposes, for the implementation of specific programs regional data are required which cover all potential polluters. Public in Austria is considerably aware of the nitrate problem. This is due to the fact that ground water is (besides spring water) the major source of drinking water. Agricultural enterprises which use ground water as a sink for their nitrogen wastes are therefore in direct conflict with the other users of this resource. Two main sources of ammonia are identified in Austria: (i) Natural nitrogen cycle: due to natural processes ammonia is emitted. Knoflacher et al. estimate that 3 kg NH<sub>3</sub> are produced per ha arable land (this totals to about 4,200 t NH<sub>3</sub>); (ii) Human activities in the agricultural and other production process: Total ammonia emission in Austria is estimated to be between 77,000 and 123,000 t per annum, the share of agriculture is estimated to be 80%. This share is

due to volatilisation which occurs when mineral and organic fertilisers are spread or stored. NH<sub>3</sub>-emission from mineral sources are estimated to lie in the bandwidth of 8,600 - 17,200 t; emission due to livestock production is estimated to be 67,300 t. The shares among the products are: 76% beef, veal, and milk, 17% pork, and 3% chickens and eggs. According to model-based estimates NH<sub>3</sub>-emission from agriculture is contributing 25% to acid rain in Austria. Generally Austria is a net importer of NO<sub>x</sub> so abatement strategies were not as successful as e.g. with respect to SO<sub>2</sub>. Combustion engines and heated glass houses with the potential of NO<sub>x</sub> emission are the major sources of this substance which can be attributed to agricultural production.

Lankoski, J. (2003) *The Environmental Dimension of Multifunctionality: Economic Analysis and Implications for Policy Design*. Agrifood Research Reports 20, MTT Economic research, Agrifood Research Finland. Helsinki: MTT Economic Research.

Multifunctional agriculture is a remarkable new direction for agricultural policy as a whole. Its objective is to improve the overall welfare of the society. Multifunctional agriculture refers to the fact that agricultural production processes produce not only food and fibre but also different non-market commodities. These non-commodity outputs of agricultural production, or elements of multifunctional agriculture, include in the broadest sense the impacts of agriculture on the environmental state of rural areas, rural landscape, biodiversity on and close to farm land, agriculture's contribution on socio-economic viability of countryside, food safety, national food security and welfare of production animals together with cultural and historical heritage. Some of the most recent definitions of multifunctionality are stricter. Lankoski mainly focuses on environmental and biodiversity elements of multifunctionality.

Loibl, E. (1997) *Der Weg entsteht im Gehen. Bäuerliche Initiativen im ländlichen Raum*, Forschungsbericht der Bundesanstalt für Bergbauernfragen Nr. 39, Wien.

As agricultural policy has failed to ensure sufficient income, some farm women and farmers try new ways in order to invent new economic bases to improve their household income. The ideas and their way of implementation are often very original, the combining of agricultural and non-agricultural activities innovative. The diversity of activities which take place on farms but proceed beyond the production of milk, beef and crops, which is referred to as para-agricultural activities in literature, are very manifold. The aim of the project is to imply innovative processes that shall become accessible to farm units with comparable resources but also to other participants in the rural areas in order to improve their economic situation. Seven groups in order to give an overview of the manifold possibilities in terms of income combinations on farms have already been built before the implementation of the survey. It is not surprising that the initiatives mostly belong to more than one group. Decisive factor in order to divide the selected initiatives was the achieved innovation. The group "Special transformation and marketing" deals with the issue of marketing of agricultural transformed products under various aspects. In this category not the conventional examples of direct marketing should be described, but models be found which transform special products out of agricultural crops and livestock as well as out of forestry products. The range of market diversified products includes transformation-products out of wool and wood, catering services with farm-own products as well as the production of cosmetics from whey, plant-oils and herbs. Furthermore this category includes cooperations like enterprises, associations, and cooperatives dealing with jointly marketing of more or less transformed agricultural products. Central issue was the requirements of team-work. In consideration of the importance of the cooperative marketing of sheep-products (dairy, lamb, wool) for the future it was presented as an own category. Under "Special products" two units have been described that produce cosmetics from goats' milk resp. from mare's-milk and sale them directly and through retail market. Beside the presentation of the implementation and development, the main issue of "cooperations" was to describe factors of influence of the team-work within cooperating participants. All products from sheep belong to the mere agricultural produce that still has an increasing market demand. Furthermore the sheep are with regards to their extensive way of holding especially suitable to sustainable agriculture in particular in the mountain regions of Austria (which cover about 70% of the total area). There has been no market for Austrian lamb meet up to the seventies. The demand was covered by imports from Australia and New Zealand. The Austrian pioneers began to sell fresh lambs of quality in particular to the restaurants and hotels in the Alps in the late seventies and beginning of the eighties. The cheap prices of foreign import-companies are a

challenge to the marketing of Austrian lambs, but the demand is still increasing so that every cooperative was optimistic about their economic future. The second group is dealing with different services (on the contrary to the production and processing of products). Social services such as taking care of children and old people are presenting traditional activities of farm women. Para-agricultural businesses does not deal with the unpaid work within the family, but shall point out examples, wherein in particular farm women but also farmers as qualified persons in taking care either of children or of old people earn money through social services. In the scope of social services an according qualification is a fundamental requirement. Energy and environment comprise activities in the scope of alternative energy as biomass-heating- and solar-energy-installations which have been installed first by farmers. The first solar-energy-installations were invested in order to reduce the costs regarding to operating resources. Two third of about 250 biomass-heating-installations in Austria are initiated and operated by farmers mostly in cooperations. The importance of these installations is that they do not cause so much environmental pollution (there is no emission of damage materials at the solar energy and an adjusted CO<sub>2</sub>-balance at the biomass-heating). Furthermore the supplying of the municipality or region with "home-made" energy is significant with regards to keeping the purchasing power in the region. Partly these biomass-heating-installations became a kind of meeting place for tourists who consume something in the regional restaurants and retail stores. Alternative use of farm-buildings comprises the range of possibilities reaches from the re-building for the purpose of letting out apartments, storerooms, offices, up to farm cafes and other kinds of restaurants, inns, in Austria the famous "Heurige" etc. wherein home-made meals and drinks are served. In the framework of Further services the combination of farm businesses and services in connection with an alternative income for farmers and farm women are described. This issue comprehends also municipal services like removing snow from the streets by snow-ploughs and tractors as well as cleaning drains etc. Furthermore seminars, etc. are taking place at farm houses. There is a wide range of services in the scope of catering, housekeeping, and child-care offered by farm women. There is a complex system of determining factors in terms of the successful implementation of initiatives. In science it is usual to describe the circumstances and requirements in a very comprehensive and difficulty understanding way whereas the participants often are going to solve their problems resp. overcome impediments straight ahead without analysing the whys and the what's. Nevertheless, in science it is necessary to divide the determinants into different assemblies which cannot be delimited from each other strictly in practice. Initiatives always mean changes with regards to the former activities and the previous usual circumstances. The first step is not the idea but the wish to change something or to do something new. This requires to perceive the actual situation and to assess it if it is satisfactory or not. There are different reasons for being not content with the actual circumstances, however. One of them can be that somebody does not have a job or farm activity according to his or her abilities. Recognition is required again in terms of discovering one's own competence. In general, farm women provide a big sensitivity for the changes in life. Thus they are often open-hearted towards readjustment and new alternative income prospects. However, they can suffer from the opposition within the farm family starting new occupations. In most cases the first impediments have to be overcome already before the activity starts.

Mayer, A.C., Stöckli, V., Gotsch, N., Konold, W. and Kreuzer, M. (2004) Waldweide im Alpenraum. Neubewertung einer traditionellen Mehrfachnutzung. *Schweizerische Zeitschrift für Forstwesen* 155, 38-44.

The results of the research project show that subalpine wood pastures produce a heterogeneous forest structure, which provide appropriate forage for cattle as well as sustainable protection from natural hazards. A condition is that the animal stocking rate does not exceed a certain level in order to keep browsing damage to a minimum, thereby influencing as little as possible the regeneration of the forest. A close combination of forest and pasture provides a better protection from avalanches than the separation of forest area from enlarged open pastures.

Milota, E. (2002) Ökologische Leistungen der Land- und Forstwirtschaft, *Statistische Nachrichten* 57 (1), S. 29-36, Wien

For tracking agriculture's environmental output methods had to be found to evaluate all typical activities that are environmentally earmarked. A lot of data could be verified – some of the results of the accounting documents of agricultural and forestry holdings for the Green Report can be put in

comparison with subsidies and subventions. From the ÖPUL (Austrian programme promoting ecological, extensive agriculture) assessment reports payments can be derived for exactly defined ecological activities as well as from studies of the Federal Institute of Agricultural Economics concerning organic cultivation. Subsidies for investments taken from evaluation reports of various assistance programmes under the aegis of the Federal Ministry of Agriculture, Forestry, Environment and Water Management, can be compared with the real amount of investments, which is usually done. The break down of data in terms of production, use and financing was calculated for the first time for 1999 within a project financed by the European Union. In trade and services most of the NACE classes in which environmental services are performed are covered by structural business statistics.

Morrée, D. de (1999) *New functions, new partnerships. Searching for common ground in land use negotiations: a vision from NGO's on the multifunctional character of land and agriculture.* FAO conference on the Multifunctional Character of Land and Agriculture, Maastricht, 12-17 September 1999, 49 pp., Bureau Beleidsvorming Ontwikkelingssamenwerking, The Hague

The paper was presented at the FAO Conference on the Multifunctional Character of Land and Agriculture, held at Maastricht, Netherlands, September 12-17, 1999. This paper was written to represent views of a working group of Dutch NGOs. Views were developed around three central concepts: (1) the multifunctionality of land and water use; (2) the sustainability of land and water use; (3) stakeholders' platforms for natural resource use negotiation.

Neunteufel, M. (1997) *Nachhaltigkeit – eine Herausforderung für die ökonomische Forschung.* Schriftenreihe Nr. 79 Bundesanstalt für Agrarwirtschaft, Wien.

The author suggests that the term ecological services could neither be satisfactorily defined nor could the problems of a monetary valuation method be solved. He stated that when bringing about ecologically sustainable development it was more urgent and more promising to solve other problems such as establishing ecological indicators or analysing the efficiency of political measures. However, it should also be emphasised that these studies were the first instance when the internationally developed range of methods for valuing ecosystem functions was used in Austria.

Organisation for Economic Co-operation and Development (OECD) (2000) *Joint production aspects of multifunctional agriculture: a consultant's report*, 68 pp., Paris

Jointness exists if the production of two or more "goods" is interlinked in such a way that a change in the supply of one also affects the supply of the others. If there is no jointness, *i.e.* if there is no technical or economic link between the commodity and the non-commodity outputs, then there is no particular agricultural policy issue to be explored and certainly no specific issue with an impact on trade or international relations. Non-agricultural provision is possible and the ideal provider is the one who can supply the "good" at the least cost. On the other hand, if jointness exists, it may confer a cost advantage, opening up the possibility that provision of the non-commodity output may be cheaper if carried out in conjunction with production of a commodity. In other words there are economies of scope. A first step, therefore, in any exploration of multifunctionality is to establish the degree of jointness with commodity production.

Organisation for Economic Co-operation and Development (OECD) (2001) *Multifunctionality: towards an analytical framework*, 159 pp., Paris

The OECD's analytical framework for multifunctionality suggests three questions that should be answered for any non-commodity output. First, is there a strong degree of jointness between agricultural commodity production and the non-commodity output? If so, is the jointness inherent or can it be altered through changes in farming practices, technologies, or non-agricultural provision of the non-commodity output? Second, assuming there is a strong degree of jointness, is there a market failure associated with the production of the non-commodity output, or do private markets exist and function well? Third, if there is a market failure, is government action required or are there non-governmental options?

Organisation for Economic Co-operation and Development (OECD) (2003) *Multifunctionality: the policy implications*, 108 pp., Paris

The report tries to develop the operational questions and guidelines necessary to elicit the required information. This step is a prerequisite to a systematic and transparent application of the framework. This section attempts to summarise the conclusions and draw the policy implications from the broad range of work, analytical and empirical, undertaken to date. It begins by defining a set of questions that is intended to be as operational and practical as possible. They are specific to each of the NCOs examined. Their intent is: (1) to establish the nature and degree of jointness between agricultural production and a sample of the most often cited “NCOs” and negative externalities, and (2) to establish whether, and in what circumstances, market failure calling for government intervention, is occurring. It is emphasised that these questions can only be definitively answered when all the multiple NCOs and negative externalities associated with agriculture in a given area have been taken into account. A further set of questions aims to identify if the NCOs are public goods, because this factor is key in determining the nature of the most efficient intervention and who should finance it. It should also be emphasised that market mechanisms may be the most efficient and accurate way of revealing some of the information required and should be used as a way of answering the questions whenever feasible. This exercise leads to the development of a policy table. It defines a number of benchmark policy options to be applied according to the degree of jointness (existence of economies of scope), the existence or likelihood of market failure, and the spatial and public good characteristics of the different NCOs. The report then goes on to define and discuss the circumstances in which the transaction costs associated with different policy options might be such as to overturn a policy implication arising from the policy table. The issue of missing information and its possible implications for the validity and practicality of the analytical framework is examined in some detail. A number of practical implications are drawn about how to overcome this type of problem. Finally, the report deals with a number of concerns that are not related to economic efficiency. Equity, stability and international spillovers are each examined. As with transaction costs, the question asked is whether and, in which circumstances a benchmark policy implication derived from the table could be overturned. The combined knowledge derived from the analytical framework, the empirical work, in-depth review of the literature on this and related subjects and the exercise to operationalise the framework that has just been described, allows some general conclusions to be drawn and some specific policy implications to be derived from them.

Orthofer, R. (1991) Abschätzung der Methan-Emissionen in Österreich (*Estimation of methane emissions in Austria*). Seibersdorf Research Report OEFZS--4586; Juni 1991

The report contains an estimation of anthropogenic and biogenic emissions of methane in Austria, which is based on data from international and national scientific and technical literature. Anthropogenic emissions are estimated to be 630.000 tons per year ( $t\text{-yr}^{-1}$ ). However, there is an uncertainty range of 290.000-950.000  $t\text{-yr}^{-1}$ . About 56 % of methane emissions are due to agricultural animal husbandry. 26 % of emissions result from anaerobic degradation of solid and liquid domestic and industrial wastes (waste dumps, sewage plants, waste water). 15 % of emissions come from production, distribution, storage and use of natural gas. Only 4 % are attributed to combustion processes, of which 2/3 are from traffic. Emissions from coal mining are minimal. Emissions densities for anthropogenic methane range from 1,4 to 1700  $t\text{-km}^{-2}\text{-a}^{-1}$ , the highest emissions densities occur in urban areas. Areas of lowest emission densities are in alpine regions and in regions in Eastern Austria where there is minimal animal husbandry. The amount of natural emissions is extremely uncertain; it may be in the range of about 210.000  $t\text{-yr}^{-1}$ . 90 % of which originate from soils and/or vegetation. Emissions from deer and wetlands are of minor importance.

Österreichische Raumordnungskonferenz (ÖROK) (2002) *Österreichisches Raumentwicklungskonzept 2001*, Wien.

ÖREK 2001 defines the principles, objectives and measures of physical planning, spatial development, and regional policy in Austria. Under the heading of „mobility and transport“, the importance of accessibility by modern means of transport for economic development, the attractiveness of business locations, and the prosperity of a region is underlined. Moreover, the Austrian Spatial Development Concept emphasises the objective of shifting the largest possible volume of transport to environmentally friendly modes. Hence, the competitiveness of rail is to be strengthened. The

upgrading of the quality and capacity of rail transport as a means of enhancing the locational attractiveness of the south and south-east of the country in terms of transport geography is explicitly demanded. The *pannoniaRAIL* project fulfils the demands of ÖREK for an improved link-up of Austria to the accession countries ([www.oerok.gv.at/Publikationen/oerok\\_schriftenreihen.htm](http://www.oerok.gv.at/Publikationen/oerok_schriftenreihen.htm)).

Pevetz, W. (1966) *Die Beziehungen zwischen Fremdenverkehr, Landwirtschaft und Bauerntum*, Bundesanstalt für Agrarwirtschaft, Wien.

The author observed a mutual beneficial relation between tourism and agriculture. He argues that agriculture supplies public benefits and should be compensated by direct payments. The public goods were identified to be: supply of landscape amenities and countryside stewardship services, maintenance of rural infrastructure and the role for viability of rural economies.

Pruckner, G. and Hofreither, M. (1991) *Bewertung überbetrieblicher Leistungen und negativer externer Effekte der Landwirtschaft* Forschungsprojekt des Bundesministeriums für Land- und Forstwirtschaft 546, 254 pp., Linz

Extensive calculations relating to the services provided by agriculture and forestry beyond business level were carried out and also dealt theoretically with approaches to valuation. As a point of reference for valuing biodiversity, although a very indirect one, they used the travel cost method (TCM) in conjunction with the agricultural character of tourist centres and the estimated replacement or reconstruction costs combined with the protective function of the forest. The calculations were carried out at the aggregate national level, i.e. for the whole of Austria. The travel costs - including estimated expenditure at the holiday resort - were classified according to regions or main tourist centres and related to the tourist provisions, the visitors income level, the agricultural character (index number) of the resort, and the proportion of fallow land in a region. The most important result was that in summer tourism the agrarian character has a considerable effect on the tourists' willingness to pay (travel costs). A 1 % increase of the agrarian character in the index would increase holiday makers' willingness to pay by 1.4 % (i.e. a total of about ATS 800 million). In winter tourism there would be a negative relationship. However, this is due to the special structure of the skiing industry, which is active chiefly in specialist tourist centres in the high Alps. Only a slight agrarian character was attributed to these centres. Another aim was to determine the functional value of forests in relation to flood control and protection against erosion, conservation of water quality as well as in relation to avalanche control. The replacement value for the given protective function of forests was taken to be the theoretical building cost of torrent and avalanche control measures for all the potentially threatened areas. The replacement costs without any discounting were over ATS 4,000 billion for permanent control measures and about ATS 1,800 billion for temporary regulation. With high discounting for 50 years, the costs would still have a current value of about ATS 1,200 billion, respectively 500 billion, which would then have been about 80 %, respectively or one third of Austria's gross national product.

Pruckner, G. (1994) *Die ökonomische Quantifizierung natürlicher Ressourcen: eine Bewertung überbetrieblicher Leistungen der österreichischen Land- und Forstwirtschaft*, Europäische Hochschulschriften-Reihe V, Volks- und Betriebswirtschaft 1561, 191 pp., Frankfurt am Main

The author carried out a differentiated willingness-to-pay analysis based on questioning over 4,500 holiday-makers in Austria. The empirical part of the study was designed to determine the maximum amount per day a tourist would be willing to pay to farmers to properly manage the landscape. The management work was described briefly in the introduction to the questionnaire, and it was mentioned that the existence of mountain farming was endangered. An average of ATS 9.2 per holiday-maker per day was obtained for the whole of Austria, which was extrapolated to give a total of ATS 720 million. The Austrians' esteem for the management of cultivated landscapes was not directly assessed, but Pruckner stated that according to a Swedish valuation approach, an annual amount of approximately ATS 9 billion would be expected. The intention of the study was also to establish a direct connection between tourism and payment for environment-related agricultural programmes in general. This met with a critical response from the tourist industry, which declined to make a specific payment without the opportunity for direct participation. This also demonstrates that, apart from wanting a generally positive image for a region, an intensive tourist industry is only interested in direct participation in maintaining and protecting natural resources if this is expected to be directly profitable.

Randall, A. (2002) Valuing the outputs of multifunctional agriculture. *European Review of Agricultural Economics* 29, 3/2002, p. 280-307

Given that agriculture produces a broad array of valuable amenities in addition to commodity outputs, 'green payments' might be a tool for maximising welfare from the agricultural enterprise. Here, I argue that getting the 'green prices' wrong would entail welfare losses and trade distortions. The valuation task requires making some fine distinctions in terms of amenity type, quality and accessibility to demanders. The environmental valuation community is able in principle to provide good estimates of willingness to pay for agriculturally produced amenities, but the valuation task requires an effort on a larger scale than has yet been attempted; and approaching the welfare optimum while minimising trade distortions requires targeting 'green prices' down to the farm level.

Rosset, P. (1999) The multiple functions and benefits of small farm agriculture in the context of global trade negotiations. Paper prepared for Cultivating Our Futures at FAO conference on The Multifunctional Character of Agriculture and Land, Maastricht 12-17 September 1999

The author challenges the conventional wisdom that small farms are backward and unproductive. Using evidence from Southern and Northern countries I demonstrate that small farms are "multi-functional" — more productive, more efficient, and contribute more to economic development than large farms. Small farmers can also make better stewards of natural resources, conserving biodiversity and safe-guarding the future sustainability of agricultural production. The on-going process of trade liberalization —now being taken a step further in the World Trade Organization (WTO) negotiations for the Agreement on Agriculture (AoA) —has already had dramatically negative effects on small farmers everywhere. The AoA has the potential to severely undercut the remaining viability of small farm production, with potentially devastating consequences for rural economies and environments worldwide. I conclude with a call to recognize the true multi-functional role and value of small farmers, and to unite in opposition to an AoA that might make their continued existence impossible.

Scheidleder, A., Grath, J., Vincze, G., Stärk, U., Koreimann, C., Gmeiner, C. (1999) Groundwater quality and quantity in Europe. Environmental assessment report No 3, EEA, Copenhagen.

This report presents the first Pan-European overview of groundwater quality and quantity based on measured data. Data and information provided from 37 countries have been used in this assessment report. Different indicators have been used to assess the pressures on groundwater quality and quantity related to, in particular, nitrate, pesticides and groundwater abstraction. The report also identifies a need for improved information on groundwater across Europe.

Schindegger, F., Zanetti, G., Deußner, R. and Doubek, C. (1997) *Regionalentwicklung im Alpenraum*, Schriften zur Regionalpolitik und Raumordnung Nr. 31, Bundeskanzleramt, Wien.

It is essential to realise that, in contrast to the assumption of economic decline in peripheral areas, the general dynamic of business and employment in the alpine area is subject to the same tendency as in the "non-alpine area": the number of people employed in agriculture and forestry has dropped drastically, industry and manufacturing still account for a large (but decreasing) proportion of total employment, and the shift of jobs towards the tertiary economy is quite marked. Tourism is a core element of the service sector in the mountain area, in particular in the western part of the alpine area. Population growth and economic development in the last 20 years have led, on the one hand, to an increase in the importance of the alpine area and, on the other, to a sharpening of disparities, also within the alpine area.

Schmid, E. and Sinabell, E. (2004) Modelling multifunctionality of agriculture: concepts, challenges, and an application, Diskussionspapier DP-08 des Instituts für Nachhaltige Wirtschaftsentwicklung der Universität für Bodenkultur, 18 pp., Wien

If policies, striving to promote the multifunctional role of agriculture, are evaluated, a vague concept must be made operational. Multifunctionality is understood to be a bundle of goods and services for which markets do not exist in any case. The most important EU policy tool to address such non-commodity outputs, is the programme for rural development. A review of literature shows that the concept of multifunctionality is broad, ambiguous, and controversial. In order to obtain a better understanding that allows quantitative assessments, we narrow the scope of its meaning. We

understand multifunctionality to be a bundle of goods and services for which markets are imperfectly developed or do not exist at all. The authors use an agricultural sector model to analyse whether the 2003 Common Agricultural Policy (CAP) reform is consistent with the promotion of multifunctionality in Austria. The results show that agricultural outputs decline due to the reform, environmentally friendly production methods become more attractive, and the level of environmental stress is reduced. We conclude that the recent CAP reform is enhancing important aspects of a multifunctional agriculture while others, like farm employment, are likely diminished.

Scholten, Th., Szibalski, M. and Felix-Henningsen, P. (2002) Multifunktionalität von Mittelgebirgslandschaften – auf den Standort kommt es an. *Berichte über Landwirtschaft* 80, 4/2002, S. 509-539, Hamburg

During the glacial periods of the Pleistocene, periglacial layers developed on almost every slope of the German low mountain ranges because of frost shattering, solifluction and deposition followed by admixing of loess and volcanic ashes. These layers represent the parent rock of today's soils. Due to high stone contents and a small buffer and available field capacity of the soils on steep valleysides and the small potentials of yield resulting from these factors, the present field and grassland cultivation is extensive and characterized by a small-scale change of cultivation forms. Alternative multi-functional land use options must consider the sensitivities of the soils and the resulting location properties regarding ecological and economic lastingness and environmental compatibility. For the spatial evaluation of these properties in highly various low mountain ranges, large-scale spatial information about characteristic soil properties is needed. These, however, mostly do not exist for soils of rural low mountain ranges that are of low political or economic interest. Therefore, concepts are presented which facilitate a valid regionalization of temporally and spatially highly variable, predominantly use-dependent soil properties as well as by the parent material and the relief of determined soil properties. The verification of the concepts is carried out in the three study areas of the SFB 299 Erda, Steinbrücken and Eibelshausen with a surface area of 5 to 10 square kilometres. The soil properties soil-pH, organic carbon content, EDTA-extractable cadmium content and buffer capacity of agriculturally used top soils as well as soil type, stone content and usable field capacity for the overall area of the districts are taken into account. The results prove the suitability of these concepts for the regionalization of soil properties in low mountain ranges with a considerable reduction of sampling and laboratory effort compared to conventional methods. The regionalization results show a high spatial resolution and precision and, therefore, practicability regarding land use planning.

Sinabell, F. (2001) Multifunctionality: Applying the OECD framework. A review of literature in Austria, Wien.

The paper reviews existing literature and research results on non-commodity output of Austrian agriculture according to the methodology in OECD. The material used for this review comprises journal articles from reviewed journals, articles from non-reviewed journals, research reports, papers presented at workshops and conferences, working papers, unpublished manuscripts and personal communication, as well as internet resources. With very few exceptions, the literature cited deals with the Austrian situation; international literature that may be relevant to Austria is not reviewed.

Tamme, O. (2004) Beschäftigungswirkungen des österreichischen Programms für die Entwicklung des ländlichen Raums: Mid Term Evaluierung 2003, Facts & Features 30 der Bundesanstalt für Bergbauernfragen, 49 pp., Wien

The impact of the Common Agricultural Policy (CAP-regime) on the farm holdings (and the family labour force) has been ambiguous since its establishment in the 1950ies. On the one hand the market orientated funding policy focused on incentive to raise productivity and speed up the movement out of agriculture. On the other hand, particularly since CAP reform in 1992 it softens the driving out forces by accompanying, (agro) structural funding policies. The shift from price-regulation towards direct payments with the CAP-reform 1992 has marked the beginning of a new era. The fact that direct payment support rather people than products is a strong point in favour of the argument that in theory and practice they have a strong impact on farm labour. This shift therefore clearly indicates the employment effect of the CAP-regime. The council regulation No 1257/1999 underlined this new approach. It made the rural development the second pillar of CAP. Rural development policy should henceforth contribute more directly to the maintenance and creation of employment in the Rural

Areas. An analysis of the termini used in the text of the regulation shows that the employment issue is mentioned most explicitly in connection with the instruments for “Less favoured areas”, “Modernisation of agriculture”, “and “Rural development measures”. Less weight is given to the measures “Agri-environment”, “Processing and marketing”, “Forestry” and “Vocational training”. The priorities of action formulated in the RDP in Austria do not translate the framework of the regulation into a coherent cross-sectoral employment aim. The programming is overwhelmingly orientated towards the prime-sector. The main impact of the RDP in Austria lies therefore on the family holdings and on preserving the labour force there. 134.117 family-holdings are participating in at least one of the measures. Less or no decisive impact is made however on the creation of new jobs. The RD subsidies contribute significantly to the incomes of the agricultural and forestry holdings in Austria. The share ranges between 49 % (market crops holdings) and 86 % (extreme mountain farmers) of the total subsidies per holding. The empirical results of an analysis and assessment of the a location of the RD indicate that in absolute figures the highest inflow of the Rural Development funds go to the big market-crop holdings due to high agri-environmental payments. This unequal distribution is strengthened by the heavy funding under the CAP-payments title they got. Mountain farmers and particularly those with extreme handicaps receive support above the average but cannot reach the support level of the big market crops farm holdings in favoured areas. This result is accentuated by the higher family labour force.

Van Huylenbroeck,G.; Durand, G. et al. (2003) *Multifunctional agriculture: a new paradigm for European agriculture and rural development*, Ashgate, Aldershot.

Throughout history, agriculture has played an essential role in the development of rural areas. Thus, despite the fact that over the past few decades, its role as an economic activity has been severely depleted, it continues to be of great importance for rural development, although its role must be radically reformulated. While agriculture is no longer the main source of employment in rural areas, farmers are looking to diversify from their traditional role as food producers by also providing non-commodity goods to society, such as landscape, nature, employment, rural viability, animal welfare, and so on. Public support is increasingly more oriented towards farms which are taking on this multifunctional role. This causes an important change in farm systems and practices requiring a broadening into new activities, an improvement in quality or value for money, or a regrouping (for example, addressing environmental concerns). To cope with such reorientation, farmers require the assistance of extension officers, sociologists and economists. This book brings together such experts to investigate what this reorientation of agriculture means in practice, how it responds to the needs of society, how it can be implemented through legislation and public policies, and how far this gives new opportunities for non-competitive or even marginal farms.

Vogel, S. (1996) Farmers' environmental attitudes and behaviour - A case study for Austria, *Environment and Behaviour*, Vol. 28, No. 5, Thousand Oaks

This paper contributes to the debate about attitudes and behaviour of farmers in respect to the environment. The empirical base comprises a survey of 2,095 farmers in Austria. A complex model of environmental attitudes in the agricultural sector has been developed. Using path analysis, this model was confronted with the survey data both to test it and to explore some major questions of the current environmental debate. An important finding is the strong influence that practical knowledge and personal experience have on the farmer's behaviour. Another major result of the model in comparison with other studies is the strong relationship derived between attitude and behaviour. The discussion of the study results considers links between socioeconomic, cognitive, and other contextual factors that form and influence farmers' environmental attitudes and behaviour.

Vorley, W.T. (2001) Farming that works: reforms for sustainable agriculture and rural development in the EU and US. Background paper to a transatlantic workshop “Sharing Responsibility for Promoting Sustainable Agriculture and Rural Development: The Role of EU and US Stakeholders”, held in Lisbon, 24-26.3.2001

Sustainable agriculture and rural development (SARD) are policy priorities in both the US and EU. But the substance of policy is diverging between the two trading blocks, into a *productivist* interpretation in the US (‘more food and income with less harm’), and a *multifunctional* interpretation (‘more public goods’) in the EU. This reflects very different agricultural heritages, which have

profoundly influenced the evolution of rural demography, trade priorities and public scrutiny on each side of the Atlantic. The result is severe trade friction over issues of financial support for farming, technology choice, and animal welfare. The reality of policy implementation, however, remains rather similar between the two blocs, with agricultural support still focused largely on commodity production or emergency bail-outs of large farms rather than ecological improvement or integrated rural development. Huge subsidies and tariffs continue to distort world markets and foreclose on opportunities for export led agricultural development in third countries, including those of central and eastern Europe. Linking ‘multifunctionality’ with continued subsidies for EU farmers has brought the term into considerable international disrepute. There are clear signals in both the US and EU that the agri-food system’s current trajectory is fast approaching its environmental, economic and socio-political limits. But there are few examples in either the EU or the US of public programmes that have an integrated view of SARD which recognise the multiple roles of farming, and which appreciate that agricultural policy is a justified means to pursue certain social, environmental and regional development goals. There is a tendency to legislate for only ecologically sustainable land management as a single cornerstone. The role of private sector actors—both positively, through demands made to processors and suppliers, and negatively, through concentrating market power and profits outside of farming and rural communities—is also consistently underestimated. Continued public support and legitimacy of agriculture in industrialised countries is contingent on continually moving farming and the agri-food system closer in line with public expectations. Joined-up farm and rural policy is required to pursue synergistic social, environmental, economic and ethical goals, and avoid the pitfall of marginalising smaller farms as exclusive environmental stewards or as welfare cases. Problems in agriculture cannot be solved only through rural development policy, and rural development policy will not be achieved only through agriculture, including ‘multifunctional’ agriculture. Both the US and EU would benefit from integrated, spatially differentiated and bottom-up rural policies. This report describes a range of means to these ends, including: (i) Strategic planning and citizen-based participatory approaches to policy construction, to take farm and food policy back to first principles, (ii) Contracts between farmers and the state, shifting agri-environmental policy from compensating farmers for forgone production to paying for environmental goods and services. Farmers observe a minimum level of environmental practice as part-and-parcel of support regimes, but addition environmental and social goods and services are for by society. These goods and services are locally specific and should best be decided at the state or regional level. Contracting even at the local community level can use local resources or grants from central government to pay local agriculture to supply such services as upstream water retention in flood prevention or bioenergy production. (iii) Policies that protect markets, recognising that industrial policy (especially vigorous competition/antitrust policy) is a justified means to pursue certain agricultural goals. We must address the distribution of profits as well as profit levels along the agri-food chain. Competition policy and civil society scrutiny must address buyer concentration and its effects on supplier welfare, and must penalise collusion and prevent undue concentrations of economic power. We must raise our expectations for private sector stimulation of sustainable/multifunctional agriculture, and draw consumer and investor attention to best practices. It is very difficult to re-create multifunctionality after it has been lost. This applies of great importance to acceding countries of CEE, many of which have farmland rich in landscape and biodiversity value — traditional agricultural systems evolved over centuries — that could be the basis for rural development. Integrity in dealing with developing countries, especially agrarian economies, is an essential ingredient of SARD implementation in the EU or US, if nations are serious about upholding social justice and supporting the dignity of human life and the common good. Claiming a unique place for agriculture and food within a society should be accompanied by granting the right for others to do the same, respecting the right of countries to produce their own food, or to seek development through on agricultural exports. Regions or countries should not build a policy of multifunctionality on a presupposition of large agricultural exports, if clear markets for those goods do not exist and/or if that status of major exporters requires large quantities of non-renewable inputs. A truly SARD-oriented policy would not tolerate huge overproduction that could not be sold profitably on the world market, and dumping or export subsidies should be redundant under these circumstances.

Weber, G. (2003) Analysis of trade and environmental policy options on the basis of a national agricultural sector model with multifunctional outputs. *Agrarwirtschaft* 52 (4), S. 218-225 Wien.

Studies on liberalisation normally do not take into account the external benefits and costs of agriculture. Empirical studies on the valuation of externalities should be integrated into quantitative modelling. MULTSIM is a national supply model of agriculture. Besides commodity output the model depicts also external benefit linked to landscape preservation and external environmental costs of agriculture. Internalisation scenarios are defined showing that the reduction of commodity-linked support and the introduction of land subsidies and intermediate input taxes have differentiated impacts on the farm types' competitiveness. A comprehensive policy approach to multifunctional agriculture requires market feedbacks to be taken into account. Internalising externalities may lead to a strong reduction of commodity output quantities. This gives rise to expectations that commodity prices would increase, which in turn would dampen the production impacts. As a consequence MULTSIM should be regarded as a bridge tool that may be linked to microeconomic based multi market models and agricultural trade models. A further strain of model development is an improved consideration of multiple policy objectives.

Wiesinger, G., Vihinen, H., Tapio-Bistrom, M. and Fagarazzi, L. (2005) The role of social capital in rural development - Conclusions from a European project on marginalisation and multifunctional landuse, paper submitted to the XXI ESRS Congress in Keszthely, Hungary 22-26 August 2005

During the last few decades both agricultural activity and different types of agricultural production have shifted geographically so rapidly that in many European countries rural and agricultural marginalisation has accelerated. The reasons for the shift have to do with the development of agricultural production technique, with the globalisation of economy and with political decisions. The regional consequences are, however, both problematic, unwanted and in most cases unintended. Even if the geographical production shift was a 'natural' phase in the development of agriculture, rural marginalisation can be seen as a result of failure in integrating agricultural, rural and environmental policies. Multifunctionality, when used as a political term, has potential to promote policy integration, since it should facilitate sustainable development in every respect. Knowledge about the vulnerability of rural communities and ecosystems and of the simultaneous implication of different policy measures is needed. The principal endeavour of the European wide project on "Strengthening the Multifunctional Use of European Land EUROLAN" which has been conducted under the EU Fifth Framework Programme on Technological Development and Demonstration Activities (FP5) was to acquire a better understanding of how multifunctional land use can counteract the problems of marginalisation and land abandonment in Europe. In this paper, we make use of the EUROLAN marginalisation case studies made in Austria and Finland, and complement the empirical picture with an Italian research, to discuss the relationship of policy integration and rural and agricultural marginalisation. We pay special attention to the role of social and political capital in rural development.

Wildburger, C. and Lebenits, R. (1996) *Impacts of Hunting on Forests in Austria*. A Study on the influence of ungulate game management in forest ecosystems, Umweltbundesamt, Monographien Band 70, Wien.

The influence of hunting on forest ecosystems results mainly from the management of game ungulates, which in an interaction through their behaviour, are passing interferences in their population dynamics on their habitats, especially on the forest vegetation, causing changes. This relationship between hunting, game and forests is developing inter-depending on other human activities, which influence game habitats and woodland ecosystems. Changes in the habitats of wildlife caused by modified and expanding uses of land, forestry, agriculture and tourism lead to higher ruminant game densities in the wooded areas. In addition to that the carrying capacity of the forest ecosystems decreased over the years as a consequence of forest practices, there are less food resources but simultaneously the deer attractivity increases according to improved safety prerequisites and the game populations are retreating and concentrating in remote areas. Generally due to a decline of the diversity of habitats through management changes the number of game species decreased, but the populations of certain toed hoofed mammals like *Cervus elaphus*, *Capreolus capreolus* and

Rupicapra rupicapra grew exceedingly supported also by activities of hunters to enlarge the stocks of their most popular game species. The raise of the density of game ungulates is the most important effect of hunting management activities. Artificial feeding, trophy hunting, a higher growth rate than harvest rate and more hunters are the fundamental causes of multiplying ruminant game populations. The raising densities are shown by a sustained increasing shooting rate over a long period. Other impacts of hunting techniques are changes in the structure of the populations and of the behaviour of the animals. This development leads to a higher pressure on forest ecosystems through the browsing of trees, which causes changes in the composition of species and a disturbance of the regeneration, and through bark peeling, which kills most of the afflicted trees and decreases the stability of the structure of the stands. Conclusively the development mentioned above in inter-dependence with other management and land use activities creates disturbances of the dynamics of forest ecosystems and leads to critical ecological situations, especially in more sensible woodland communities like high elevation protected forests. Data analysed in the study concerning the development of hunting management and the influences of ruminant game populations on forest ecosystems can be found in the particular chapters and tables in the appendix.

Wrbka, T.(et al.) (2002a) Kulturlandschaftsgliederung Österreich. Forschungsprogramm Kulturlandschaft. Bundesministerium für Bildung, Wissenschaft und Kultur, Wien.

Wrbka, T.(et al.) (2002b) Landschaftsökologische Strukturmerkmale als Indikatoren der Nachhaltigkeit. Forschungsprojekt SINUS. Forschungsprogramm Kulturlandschaft. Bundesministerium für Bildung, Wissenschaft und Kultur, Wien.

A generic model for the evaluation of agricultural landscapes is presented. The starting point of the model is the stratification of the reporting unit into so called landscape types. For each of these types a guiding vision – a commonly agreed desirable status of the respective landscape type - has to be developed, based on which a limited set of indicators can be used to evaluate the present state of a landscape and the changes over time. The applicability of the indicator set for the evaluation of landscapes and cross cutting issues like various landscape functions (e.g. biodiversity, intensity of land use) could be demonstrated for examples in Austria. The scientific background for this approach is the proposed relationship between structural features of a landscape and its functions and processes. For the in depth analysis automated procedures for the segmentation and classification of earth observation data in combination with GIS utilities are – due to the amount of data do be handled – form a major part of this approach. For the whole territory of Austria 42 different landscape types could be identified and delineated by means of satellite image interpretation. The developed indicator system is used to point out the relationship between the current structure of a landscape as documented by satellite data and the information on processes linked to this structure.