REFORMING PILLAR 2 –TOWARDS SIGNIFICANT AND SUSTAINABLE RURAL DEVELOPMENT?

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Abstract

With the ongoing "Health Check" and the decisions needed for after 2013, the Common Agricultural Policy is likely to see another major reform and an increase in compulsory modulation. By employing a regional model, this paper compares the long-term impact of spending along the Pillar 2 Axes in NUTS3 areas on selected indicators of sustainability in several peripheral areas across Europe.

The four case study areas are: Pinzgau-Pongau (a tourism-dominated alpine area in Austria), the Wetterau (an urbanised industrial area in Germany), Gorenjska (a tourism and manufacturing dominated area in Slovenia) and Caithness-Sutherland (a remote area in Scotland).

The results suggest although devolution in European rural development policy has taken over the last 10 years, there is further need to restore place-based stewardship of public goods and services as well as private investments across rural areas in the European Union. Increasing the importance of Axis 2 and Axis 3 measures (part of CAP Pillar 2) therefore seems an obvious choice for the future.

Furthermore, it is clear that the effects of wider societal trends such as the decreasing importance of agriculture, commuting and migration, can be weakened or amplified by EU funding but can not be reversed or significantly changed.

Key words: CAP, Pillar 2, rural development

JEL classification: R15, Q18, Q01

Introduction

In 1997, the Agricultural Council (document 12509/97) adopted a set of conclusions in which it developed the basics of the concept of the European Model of Agriculture. As part of the European Strategy for Sustainable Development based on the decisions of the European Council in Göteborg (June 2001), environmental dimensions were added to social and economic ones. In the same year, the Agricultural Council integrated environmental and sustainable development as political terms and targets into the Common Agricultural Policy (CAP) and supported and adopted the European Model of Agriculture and particularly the concept of Multifunctionality of Agriculture (MFA) as a core part of European farming policy.

While in most developed countries (OECD 2006,8) the farming sector is in decline, it remains vital for many remote and peripheral areas. Indeed in such areas it is in most cases an important economic activity and provides income, employment and quality of life for farm households and the broader public. In urban and peri-urban areas the most important functions of agriculture are namely the provision of eco-system services and recreational areas generally in the form of public goods (Weber et al. 2008).

As the statement of the Finnish presidency (2006, 6) shows: "Multi-functionality is at the heart of the European Model of Agriculture. This means that together with competitive food, fibre and energy production farming also delivers other services for society as a whole. These services, which are closely linked to food and fibre production, include safeguarding viable rural societies and infrastructures, balanced regional development and rural employment, maintenance of traditional rural landscapes, bio-diversity, protection of the environment, and high standards of animal welfare and food safety. These services reflect the concerns of consumers and taxpayers. As European farmers provide these multifunctional services for the benefit of society as a whole, which often incur additional costs without a compensating market return, it is necessary and justified to reward them through public funds. In most European countries family farms are the key element in fulfilling the objectives"[1].

At the time (the late 1990s) when the European Model of Agriculture was developed, there was a widely shared understanding that agricultural policy should be modified in order to support functions or roles of agriculture that go beyond the production of food and contribute to the sustainable development of rural areas. Besides the primary targets of farming (provision of food in the first place, income and employment opportunities) within the economic development process, such roles of agriculture as the provision of eco-system services, landscapes, renewable energies and social viability of rural communities have become more and more important (cf. Van Huylenbroeck et al. (2007,7f.).

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[1] For a discussion of the functions of agriculture and policies that influence the provision of goods and bads as well as environmental and social services that agriculture is likely to provide, see Bergmann and Thomson (2007).

The TOP-MARD Project

The main target of the EU FP6 research project TOP-MARD was the development of the concept of multifunctionality as helping to analyse rural development policy with a focus on the economic, social, cultural and environmental context on a territorial scale. In this understanding, the TOP-MARD approach (see table below), in comparison to the Roles of Agriculture approach (FAO, 2002) and the Multifunctionality approach (OECD, 2000), fills a gap and develops the concept of MFA as it explicitly analyses

- regions rather than nations or individual farms
- the links between rural development and agricultural policies
- public goods and services.

The POMMARD Model

Structure and Development of POMMARD

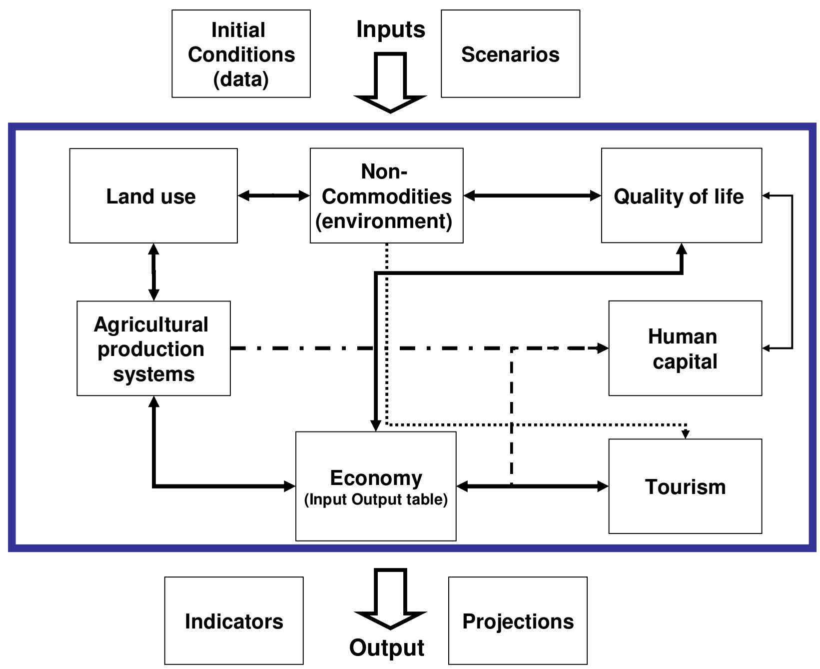
The POMMARD model is built with the Stella© software (ISEE, 2007), representing stocks and flows using user-defined variables, parameters, equations and time periods.

POMMARD is used to simulate the behaviour of a rural region as a whole (i.e. not individual farms or other businesses) in terms of its demography, economy, environment and Quality of Life (QoL) over a number of years (at least 15, in the case of TOP-MARD). It contains 11 modules: Land Use (see below), Agriculture, Non-Commodity Outputs or NCOs (environmental), Economy, Investment, Human Resources (demography), Quality of Life, and Tourism, together with Initial Conditions, Scenario Controls and Indicators (i.e. major model results). Figure 1 depicts the graphical model interface.

The scientific modelling approach behind POMMARD is based on Johnson (1986) and Leontief (1953), in which dynamic regional shifts are included in a localised IO table. The initial IO approach was amended during the final TOP-MARD reporting period insofar as regional specific Social Accounting Matrices (SAM) including production activities, different capitals (e.g. institutional) and Quality of Life (QoL) indicators were developed (Bryden et al. 2008).

The primary engines of the model are final demand by economic sector (23 in the core model) and land use by up to 8 agricultural (and other, e.g. forestry) production systems. Such use, specified by shares of total regional area, determines the amounts of labour employed in these systems, and the output of farm commodities and environmental non-commodities. The regional economy is modelled via an input-output table to which a “households” row and column are added, while the Investment module modifies the capacity of each sector. However, unlike many models of economic relationships, the model is partially supply-oriented, insofar as agricultural activity supplements other demand drivers.

Figure 1 - The Structure of the POMMARD Model



Source: Bergmann and Thomson (2008, 4).

The regional population is modelled in some detail, e.g. four age groups and six educational levels (in and after primary (age 14), secondary (age 19), and tertiary education, respectively (age 22)). These age-education cohorts are represented in the employment and migration vectors.

The core version of POMMARD was under development throughout 2006 and 2007, and a preliminary version was delivered to the 11 case study area teams in November 2007, along with a 90-page manual or guide.

In the early stages of the modelling process the calibration of the model was mainly done by comparing projected model outputs and published data about the development of the population size.

Calibration in POMMARD is basically a change in the most important demographic coefficients so that the whole model results in a "better" projection (see Bergmann and Thomson, 2008). Calibration was done by comparing the statistical "real" data between 2001 and 2007 with the results that POMMARD delivered for the period. In most cases (Germany, Scotland, Sweden) the calibration basically needed adaptation in the labour force participation rates while in other cases the models had not to be calibrated at all as the differences between reality and estimated were sufficiently small.

Output indicators employed in POMMARD

The assessment of policies related to MFA and RD can be done with large numbers of indicators. For example in the FP5 funded project DORA a confusing number of more than 57 indicators as previously done by Bryden (2002,14f.) and Bryden et al. (2004). Focussing on the implications that policies have for the status of biodiversity across Europe is proposed by the EEA (European Environmental Agency) by 25 indicators (cf. Schuyster, 2007, 18f.) and focussing just on the assessment of Quality of Life Eurofund (2008) employs more than 150 indicators.

In order to facilitate results interpretation for the general public, the TOP-MARD project decided that only 24 indicators were needed. Bergmann et al. 2007 argue that an even smaller number of probably 8 core indicators would be appropriate. In this paper due to place restrictions, the following core 5 categories and indicators are chosen :

- Demographics – population size,
- Farming – farm employment,
- Economics – regional per capita income
- Population change – annual regional net migration balance,
- Environmental quality – annual change in Biodiversity indicators.

The case study areas

The comparison of social, economic and ecological indicators between four TOP-MARD case studies reveals vast differences that are place dependent (peri-urban, remote rural or peripheral, see table 1).

The case study areas that have been chosen for this comparison are:

- Pinzgau-Pongau (P-P; a tourism-dominated alpine area in North-Western Austria near Salzburg and the German border, NUTS3 Code: AT322),
- Wetterau (WE; an urbanised industrial area in the middle of Germany in the Bundesland Hessia near Frankfurt/Main, NUTS3 code: DE71E),
- Caithness-Sutherland (C&S, a remote rural peripheral area in the Far North of Scotland and a part of the Highlands and Islands, NUTS3 Code: Part of UKM61, LAU1[2]) and
- Gorenjska (GK, a tourism and manufacturing dominated alpine area in the North of Slovenia near the Austrian border part of a new accession EU Member state, NUTS3 Code: SI022).

All areas have a lower population density than the relevant national average, are more or less rural in so far that agriculture has a large proportion of regional GVA, and are mountainous regions except the WE (Germany). The main functions of agriculture in all

[2] Local Administrative Unit = formerly NUTS4

CSAs are to (a) produce food and fibre, (b) protect the environment, (c) ensure the social viability of rural areas, (d) guard rural culture and (e) provide a basis for lifestyle choices (Thomson, 2005).

Table 1 - Key Data for Case Study Areas in 2001

		Austria (NUTS3) Pinzgau-Pongau	Germany (NUTS3) Wetterau	Scotland (LAU1) Caithness & Sutherland	Slovenia (NUTS3) Gorenjska
Agriculture	Unit				
Number of farms	number	4,370	660	3,321	4,680*
Net farm income	€1,000	8.48	33.17	7.89	10.91*
Average ESU per farm	ESU	7.15	26.81	6.68	5.01*
Labour demand	Head	4,510	1,408	2,325	5,420*
Farmed and Forested land	Ha	176,410	36431	281,197	32,460
Demographics					
Population size	Head	161,996	296,153	38,972	195,885
Under 20	Head	42,361	63,847	9,177	45,457
Over 65	Head	20,939	48,463	7,213	27,938
Net-migration annual flows	Head	400	6,027	-100	0
population density in km²	km²	37.20	269.06	5.41	92.22*
Economics					
GVA per capita	€/head	22.2	33.4	10.0	9.9
GVA land use	1,000 €	105,107	46,699	18,350	42,337
Regional employment	Head	73,484	75,954	15,367	92,458
Environment					
Biodiversity indicators	None	373,757	66,359	281,193	45,252
Natural capital change	None	0	0	0	0
surface	Ha	435,500	110,070	720,000	212,400*

Source: Eurostat.

** data for 2003*

For GK, the dominating roles are (a) and (c), and to some extent even the role of agriculture as a basis for rural development is present. On the other hand the dominating roles of agriculture in WE are (b) to (d). The other two CSAs (C&S and P-P) can be found in between, e.g. C&S farming is basically a lifestyle choice while in P-P it is protecting the environment (b) and ensures the viability of rural areas (c).

Scenario specification and results

Scenario specification and calculation

The CAP reform of 2003 introduced decoupled "Single Farm Payments" (SFPs) and voluntary as well as compulsory "modulation". It is likely that the modulation instrument will see more use in future in that the current compulsory rate of 5% will be raised. Currently held speeches by the European Commissioner for Agriculture and Rural Development indicate that (Fischer-Boel, 2008,3):

- "the common market organisations (e.g. the milk as well as the sugar market quotas) are to be phased out,
- Single Farm Payments should be paid to farmers, defined according to common sense… and
- "progressive" modulation (i.e. limiting the amount of SFPs paid to larger farms) may be introduced".

With savings used to address new challenges (e.g. climate change, bio-energy, water scarcity, biodiversity, increase social cohesion, etc.) the rural development pillar will be strengthened.

Certain for the future seems that there will be a shift in CAP expenditures towards Pillar 2 in order to strengthen environmental land management, rural development (including investments into the farming sector) and social cohesion (see Thomson and McGranahan, 2008). The effect of this shift can be analysed with POMMARD.

Five scenarios were specified:

(a) Baseline scenario, based in EU expenditures 2001-06, including all changes that took place in 2006/7 (most prominent the introduction of Single Farm Payments [SFP] and an annual land use change defined as a trend based on the years 1991-2001),

(b) Axis 1 scenario, in which all funds being spent in Pillar 2 are spent in Axis 1 to improve the competiveness of the agricultural sector,

(c) Axis 2 scenario, in which all funds being spent in Pillar 2 are spent in Axis 2 to provide agri-environmental goods and services as well as to support agriculture in less favoured areas.

(d) Axis 3 scenario, in which all funds being spent from 2007 onwards are spent in Axis 3 to improve the quality of life and competiveness of rural areas.

(e) Modulation scenario, in which Pillar 1 expenditures are decreased by 50% and subsequently are spent in Pillar 2 under Axis 3

Specification of the baseline scenario

The baseline scenario applied includes an annual land use change defined as a trend based on the years 1991 to 2001.

Scenario specifications were guided by the following assumption related to the IO tables estimated for the year 2001 (or later in the case of the Slovenian case study area). European Union expenditures for the years 2001 to 2006 were a part of the whole IO table. The effects of this spending were calculated on the basis of assumptions on:

(1) in which sectors each Pillar's expenditures were effective (e.g. in all presented case study areas the assumption on Axis 2 expenditures was that it altogether increases households incomes) and

(2) which leverage effect was related to the spending under each Axis (e.g. €1 spent by the EU along Axis 3 attracts an additional €1 from the member state and €2 in terms of private investment).

Modelling the changes that came into effect in the year 2007 for the period 2007 to 2013 was done in a similar way, and the results were compared for each scenario by appropriate adding and subtracting of the effects that the expenditures had during the period 2001 to 2006.

All scenarios were adapted to local conditions and public expenditure patterns, to reflect the fact that in each of the case study areas Pillar 2 measures are implemented with different regional coefficients and data but common guidelines, affecting different input variables. For example, in Scotland and Slovenia, Axis 2 expenditures are shared between agri-environmental schemes and Less Favoured Area support, while in Germany the agri-environment is the target area. In Austria both schemes are characterised by a high levelof support to mountain farms, underscoring the linkage of mountain farming to tourism (Dax and Hovorka, 2004). Most other variables (e.g. land use change, birth rates, labour force participation rates, quality of life indicators, etc.) were estimated using time series analysis or available data from official statistical sources.

Results

Since the scales for each CSA differ to a large extent, all results in this section are calculated as a percentage of the main baseline results for the year 2015.

While in Scotland and Austria the largest differences to the main baseline are up to 10%, the largest effect of a scenario in the Wetterau is below 0.5%, showing that in a largely urban fringe area the impact of EU policy changes is measurable but insignificant. On the other hand in the more rural areas of P-P and C&S there are significant effects of policy changes.

Specific case study area results: Pinzgau-Pongau

The highest increase in population size (see Table 2) can be expected with the Axis 2 scenario, that as well increases the number of tourists visiting P-P and therefore would also create additional employment. On the other hand population would decrease with Axis 1 and Axis 3 scenarios as an effect of the investment into investments in sectors that need more capital to employ one person (education, private services, etc.) compared to the additional demand for tourism labour as a result of Axis 2 scenario. Quite surprisingly there are no changes to agricultural labour demand in P-P over all scenarios.

Table 2 - Scenario results for P-P. in 2015

Austria (2015)	**Main Baseline**	**Axis 1**	**Axis 2**	**Axis 3**	**Modulation**
Total Population	100.0%	99.7%	100.1%	99.8%	100.0%
Ag Employment	100.0%	100.0%	100.0%	100.0%	100.0%
Per Capita Income	100.0%	99.4%	100.2%	99.4%	99.9%
Total Migration	100.0%	110.8%	97.0%	109.7%	101.5%
Biodiversity	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Own calculations.

However, due to the fact that almost all labour in Austrian agriculture is provided through family households, provision of labour is hardly dependent on market forces over the long term, but more determined by life-style choices and intergenerational decisions to keep up farming (or not).

Per capita income as a measure of economic well-being over all scenarios is changed only to small amounts. The best scenario in Austria regarding this indicator is again the Axis 2 scenario in which a better environmental quality generates additional regional incomes through increased touristic demand.

Total annual net-migration is highest in the Axis 1 scenario at 110.8% and lowest in the Axis 2 scenario. This indicates that as the Axis 2 scenario significantly increases the local quality of life as well as developing new regional jobs, people tend less to out-migrate less.

At least the Biodiversity indicator does not change at all in P-P. because the environmental quality is good and any measure that doesn't drastically change the environment is mostly affectless for the region.

Overall comparing the results of the five scenario runs for P-P. it is revealed that under the scenarios the most attractive option would be the Axis 2 scenario, followed by the main baseline and the modulation scenario as in all three the population sizes stays stable (or increases), and the per capita income increases or stays almost the same.

Specific case study area results: Wetterau

The WE results generally show only smallest changes (<0.1%) compared to the main baseline. The population would be increased through increased investments into labour saving technologies in agriculture by Axis 1 scenario, while it would decrease as the German Axis 2 measures mostly target the extensification of production systems. The highest degree of population increase can be found by measures undertaken under Axis 3, a supporting result for the assumption that the current LEADER measures are able to support rural viability to a small extent in the WE.

As in P-P. there are no changes to agricultural labour demand in WE over all scenarios. The same result can be found regarding per capita income. However, there is a decrease as a result of the modulation scenario as farm households loose a significant share of their household income and this is only partly substituted by higher incomes of employees of other than agricultural sectors.

Table 3 - Scenario results for WE in 2015

Germany (2015)	Main Baseline	Axis 1	Axis 2	Axis 3	Modulation
Total Population	100.00%	100.09%	99.99%	100.18%	100.05%
Ag Employment	100.00%	100.00%	100.00%	100.00%	100.00%
Per Capita Income	100.00%	100.00%	100.00%	100.00%	99.80%
Total Migration	100.00%	100.14%	99.86%	100.14%	100.41%
Biodiversity	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Own calculations.

Total migration is negatively affected by the Axis 2 scenario, as decreased spending on economic investments in Axis 1 and Axis 2 in WE leads to a lower regional labour demand. The biodiversity indicator again shows no changes as German landscapes are highly regulated and therefore changes between the different land use categories (e.g. arable land, grassland, woodlands, etc.) are unlikely to happen.

Overall comparing the results of the five scenario runs for WE. it is revealed that under the scenarios the most attractive option would be the Axis 3 scenario, followed by the Axis 1 and Axis 3 modulation scenario as in all three the population sizes stays stable (or increases), and the per capita income increases or stays almost the same. The worst scenario seems to be the modulation scenario in which per capita income drops while population increases somewhat.

Specific case study area results: Caithness and Sutherland

The C&S results generally show probably the largest changes under all scenarios and CSAs. The population would be significantly increased through increased investments into education and manufacturing by Axis 3 scenario, followed by a large increase effected by Axis 1 investments into machinery and other technology being useful in the farming sector. There are as in the other CSA no changes to agricultural labour demand in C&S over all scenarios. Per capita income is decreased by Axis 1 scenario by nearly 2% as well as in the modulation scenario, while it would be increase significantly by 4% in the Axis 2 scenario and by 1% in the Axis 3 scenario.

Table 4 - Scenario results for C&S in 2015

Scotland (2015)	Main Baseline	Axis 1	Axis 2	Axis 3	Modulation
Total Population	100.0%	104.0%	100.4%	109.0%	102.9%
Ag Employment	100.0%	100.0%	100.0%	100.0%	98.3%
Per Capita Income	100.0%	98.2%	104.1%	101.0%	98.9%
Total Migration	100.0%	88.9%	83.0%	97.0%	107.2%
Biodiversity	100.0%	100.1%	100.1%	100.1%	100.3%

Source: own calculation.

Total migration is negatively and strongly affected by the Axis 1 and 2 scenario, as decreased spending on economic investments in Axis 1 and Axis 2 in C&S leads to a lower regional labour demand. Total migration however would be positively influenced in 2015 by the modulation scenario, as it would be 7% higher than the main baseline scenario. The biodiversity indicator sees its highest change with the modulation scenario probably indicating that a more diversified development approach in C&S would not only profit rural viability but also the environment.

Overall comparing the results of the five scenario runs for C&S it is revealed that under the scenarios the most attractive option would be the Axis 2 scenario, followed by the Axis 3 and modulation scenario as in all three the population size increases, the per capita income increases and the marginal change of the biodiversity indicator is significantly positive. The worst scenario under those presented would be the Axis 1 scenario, since although it increases population size and the biodiversity indicators, it decreases the per capita income, making the regional population worse off than in the main baseline.

Gorenjska

The GK results are surprisingly similar to the results of the WE. This similarity is based on the scenario description as we assume that only CAP expenses are altered which represent under 10% of all expenditures in rural areas compared to 90% donated by structural funds in Slovenia.

The Axis 2 scenario is likely to increase population size indicating that preservation of farming and the environment in this marginal area preserves the settlement pattern. The modulation scenario is likely to decrease it, caused by a significant number of farms being shutdown. There are as in the other CSA no significant large scale changes to agricultural labour demand in GK over all scenarios, however again the modulation scenario is decreasing labour demand, while the Axis 2 would increase it. Per capita income is decreased by all Axis scenarios by nearly 0.2% apart from the Axis 2 scenario in which increased population counteracts with per capita income increase that is provoked by higher wages in the tourism sector than in the delivering farming sector.

Table 5 - Scenario results for Gorenjska in 2015

Slovenia (2015)	Main Baseline	Axis 1	Axis 2	Axis 3	Modulation
Total Population	100,0%	100,0%	101,2%	100,0%	99,1%
Ag Employment	100,0%	100,0%	100,3%	100,0%	99,8%
Per Capita Income	100,0%	99,8%	100,4%	99,8%	99,5%
Total Migration	100,0%	101,0%	116,7%	100,5%	92,5%
Biodiversity	100,0%	100,0%	100,3%	100,0%	99,8%

Source: own calculation.

Total migration is significantly negatively affected by the modulation scenario, while all other scenarios reveal that annual net migration is higher in all other scenarios, showing that the area becomes more attractive for potential in-migrants by each of the Axis 1 to Axis 3 scenarios. The biodiversity indicator sees its highest change with the Axis 2 scenario suggesting that might be a result of higher public support on environmental and spatial public goods would reinforce the environment as well as profit rural viability.

Overall comparing the results of the five scenario runs for GK it is revealed that under the scenarios the most attractive option would be the Axis 2 scenario, followed by the Axis 3 and Axis 1 scenario as in all three the population size increases, the per capita income increases and the marginal change of the biodiversity indicator is significantly positive. Probably as a sign of the not yet reached saturated development status in the richer other CSAS, there seems to be a need first to invest into agriculture (Axis 1), the environment(Axis 2) and education/new employments (Axis 3) before a more diversified approach like modelled in the “modulation scenario” should be chosen under the Slovenian circumstances.

Discussion and Conclusion

This paper presented a modelling approach that uses a holistic territorial approach to overcome the limitations of current approaches that prefer an economic focus on questions related to rural development.

The results show that when a common specification has been chosen, the results vary dependently to the countries of the CSA and even more important - as the GK example shows - whether the member state is an "older" or a "newer member".

Summarizing across the EU, the area-specific results show that:

- Axis 1 expenditure increases overall local employment more than the other three scenarios and may therefore help to ensure rural viability in farming areas. However, other components of sustainability, e.g. quality of life, and environmental quality, can be affected negatively.
- Axis 2 expenditure improves the environment as well as the quality of life in all areas and leads to increases in local employment through multiplier effects.
- Axis 3 expenditure has positive effects in near-urbanised central European regions, but in peripheral regions is unlikely to be sustainable without continued EU support since better qualification is an additional out-migration push factor.
- In Western European CSAs (Part of the EU15) the modulation scenario has positive effects on the local economy as well as not changing the economic position of agriculture, since with higher commodity prices farmers (even if factor prices increase as well) are likely to be compensated for loses of the SFP (a classical example that in the long term profit-seeking can have better effects than rent-seeking). The modulation scenario in Slovenia shows that before a holistic approach to rural development can be chosen, regional pre-conditions like in the EU15 have to be reached.

The model results suggest that the local/regional effects of wider societal trends such as population movements, service-dominated work and commuting and tourism diversification can be supported by European Union policies but not be reversed or even significantly changed in order to achieve more sustainability.

Furthermore the results show that in highly developed rural areas such as C&S, P-P and WE expenditures targeting Axis 3 are appropriate, while in GK the results suggest that prior to extend axis 3, steps should be undertaken to support the agri-environment through Axis 2.

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